TABLE OF CONTENTS

▼

235 **Update**

Academic Programs; Foundations; Nongovernmental Organizations; Governmental Activities; and
Intergovernmental Activities

273 **Bibliographic Guide to the Literature**

FOREWORD
By Geoffrey D. Dabelko, Editor

Facilitating dialogue is at the heart of the of both the Environmental Change and Security Project (ECSP) and its home, Woodrow Wilson International Center for Scholars. While the Wilson Center fosters conversation between the worlds of scholarship and policy on a myriad of topics, ECSP focuses on identifying connections among the critical global issues of population, environmental change, and security. We trust that you will find this, our seventh annual issue of the *ECSP Report,* a most substantive contribution to those efforts.

In our lead article, Ellen Messer, Marc Cohen, and Thomas Marchione highlight the need to explore linkages between different sectors of concern. Their examination of hunger as a cause and effect of conflict provides a grim account of all aspects of this cycle while also identifying positive steps to address the political challenges of this problem. Richard Matthew, a frequent contributor to ECSP efforts, then reports on his recent investigation of Pakistan's North-West Frontier Province. Matthew finds environmental, demographic, and health factors key to understanding the oppressive human insecurity in this region.

Brazil provides the regional focus for Issue 7 with contributions by two close observers. Margaret Keck's article lays a foundation for understanding environmental activism in the Brazilian Amazon, a crucial history for any public or private initiative engaging in Amazonian environmental or demographic collaborations. Thomaz Guedes da Costa then looks closely at SIVAM, Brazil's heralded new information-gathering system for the Amazon. While this massive project has been sold domestically and internationally as a generator of both security and environmental data, da Costa finds that SIVAM thus far is oriented exclusively towards traditional defense goals, with virtually no mechanisms in place to reap gains from the environmental, demographic, migration, and development information that could surely flow from this system. In a special report, Steve Kiser also picks up this environmental monitoring theme, providing recommendations for how U.S. intelligence community assets could be further used for the environmental security mission.

A special commentary section on the National Intelligence Council's *Global Trends 2015* report is at the heart of ECSP efforts to facilitate applied learning across institutions. *GT 2015*, the product of a "dialogue about the future with NGO experts," is the U.S. intelligence community's effort to peer over the horizon and identify drivers of change in the next fifteen years. We follow excerpts of the report with commentaries by 14 observers from a wide range of backgrounds; they write on everything from *GT 2015's* environmental, health, and demographic predictions to its very fitness as an intelligence product. Continuing the constructive dialogue, NIC Acting Chairman Ellen Laipson concludes the section with a considered response to the commentaries.

Current population debates are at the center of two special ECSP efforts for Issue 7. First, Nicholas Eberstadt's provocative arguments in a recent *Foreign Policy* article about an impending global "population implosion" served as the catalyst for a by-invitation, on-line discussion on the state of population trends, programs, and approaches. "Is There A Population Implosion?" provides a transcript of the lively exchanges here among Eberstadt, Amy Coen, Stan Bernstein, Sonia Corrêa, Carmen Barroso, and Parfait M. Eloundou-Enyegue. Despite perceived high levels of certainty associated with demographic projections, these forum participants find numerous issues upon which to differ.

Departing ECSP colleague Shanda Leather then provides a taste of forthcoming population and water analyses that will appear as a special ECSP publication this fall. In "The Linkages Between Population and Water," Leather describes three new articles, each commissioned by the Project and jointly written by a different Northern and Southern analyst team. The articles delve into a host of population-water topics (including health, intersectoral competition, and water quality and quantity) and feature multiple regional focuses, including the Philippines, India, and Southern Africa.

With Issue 7 we also introduce a new look for the *ECSP Report,* which we trust will make its ideas and exchanges even more readable and appealing than in the past. Because the cumulative total of citations in the field of population, environmental change, and security is now so large, we believe it warrants a special companion publication that will appear on-line and in hard copy in the coming months. As always, we encourage all interested individuals to submit feature articles and reviews, update entries, official statements, and bibliographic citations for inclusion in forthcoming issues.

Finally, the Project must bid farewell this year to three valued colleagues: Shanda Leather, Clair Twigg, and Simona Wexler. They each brought tremendous dynamism and energy to the Wilson Center, achieving great success for the Project as a result. We wish them all the very best in their new endeavors.

CONFLICT: A CAUSE AND EFFECT OF HUNGER

By Ellen Messer, Marc J. Cohen, and Thomas Marchione

Abstract

Ensuring food security—especially in Africa—depends on breaking cycles of hunger and conflict. Whether one believes that (a) environmental scarcities (including food insecurity) can cause conflict, or (b) that conflict is primarily caused by political factors, it is indisputable that access to food is always disrupted by conflict. Much has been written about the linkages between environmental scarcities, hunger, and conflict. This article (a) highlights certain gaps in the information about the steps that lead from hunger to conflict, and then (b) suggests policies and actions to break these connections.

In 1999, there were 27 major armed conflicts worldwide and 10 additional minor armed conflicts. All but two were classified as civil wars (see Table 1)[1] (Wallensteen & Sollenberg, 2000), but those in Africa usually involved neighboring countries in flows of arms, relief, and refugees.

Food wars—a concept which includes the use of hunger as a weapon in active conflict and the food insecurity that accompanies and follows as a consequence—had left close to 24 million people in 28 developing countries, transition countries, and territories hungry and in need of humanitarian assistance. Many of these people experiencing conflict-induced hunger were among the world's 35 million refugees and internally displaced persons; others remained trapped in conflict zones (UNHCR, 2000; FAO, 2000a; USCR, 2000; and ACC/SCN, 2000). Women and children accounted for 70 to 80 percent of those uprooted by violence (USCR, n.d.). Even in regions where food might have been available, conflict rendered people food-insecure: they lacked access to sufficient food to sustain healthy and productive lives (see Table 2).

CONFLICT AS A CAUSE OF HUNGER

Over both the short and the long term, populations, households, and individuals of countries in conflict suffer disruptions in livelihoods, assets, nutrition, and health. Combatants frequently use hunger as a weapon: they use siege to cut off food supplies and productive capacities, starve opposing populations into submission, and hijack food aid intended for civilians. They may intentionally or incidentally destroy crops, livestock, land, and water. Deliberate asset-stripping of households in conflict zones may cause those households to lose other sources of livelihood as the ongoing conflict leads to breakdowns in production, trade, and the social fabric. The disruption of markets, schools, and infrastructure removes additional resources required for food production, distribution, safety, and household livelihoods.

In southern Sudan, for example, violence in November 2000 left an estimated 2.6 million people in need of emergency food assistance (FAO/WFP, 2000). Donors (who have been feeding this war-torn region for more than a decade) struggle to deliver the aid essential to (a) save lives, (b) renew the area's

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Thomas Marchione, an anthropologist, is Nutrition Advisor at the Bureau for Humanitarian Response, U.S. Agency for International Development. This article does not represent the official view of that agency.

Table 1. Armed Conflicts in 1999		
Continent	**Major Conflicts**	**Minor Conflicts**
Europe	Russia (Chechnya) Yugoslavia (Kosovo)	Russia (Dagestan)
Middle East	West Bank and Gaza Turkey (Kurdistan)	
Asia	Burma (Karen State; Shan State) India (Assam; Kashmir) India-Pakistan Indonesia (Aceh) Philippines (New People's Army) Sri Lanka	India (Jharkand; Manipur; Tripura) Nepal Phillipines (Mindanao)
Africa	Algeria Angola Burundi Congo, Republic of Congo, Democratic Republic of Eritrea-Ethiopia Guinea-Bissau Rwanda Senegal Sierra Leone Sudan Uganda	Chad Ethiopia (Ogaden; Oromiya; Somali)
South America	Colombia Peru	

Source: Wallensteen & Sollenberg (2000)

productive capacities to generate sustainable livelihoods; and (c) administer programs of food and development assistance in ways that do not fuel further conflict, but instead encourage peace negotiations and an end to fighting. In Mozambique, the cumulative loss of output attributable to the 1982-92 civil war exceeded $20 billion—a figure ten times greater than actual output during the last year of the war. Conflict removed over half of the country's population from customary livelihoods; it also devastated Mozambique's markets, communications, health services, and infrastructure (Green & Mavie, 1994).

National military allocations inevitably draw investments away from sustainable development and redirect people from peaceful to destructive pursuits. Instead of building sustainable development, countries in conflict suffer long-lasting losses, including losses to food production.

Food Production Foregone

In an earlier study, the authors roughly estimated

the extent of food production losses due to conflict by examining trends in war-torn countries of sub-Saharan Africa during 1970-94 (Messer, Cohen, & D'Costa, 1998). That study compared actual mean food production per capita with "peace-adjusted" values for 14 countries and found that, in 13 countries, food production was lower in war years by a mean of 12.3 percent. Declines ranged from 3.4 percent in Kenya to over 44 percent in Angola. The study also calculated the differences in these countries in mean food-production growth during war and non-war years as well as these countries' contributions to regional food production trends. These reductions in food-production growth rates were cumulative, declining from 1.3 to 3.5 percent in the 1980s and from 3.9 to 5.3 percent in the 1990s (see Figure 1).

These declines are significant for more than their impact on food availability in the region. In 13 of the sub-Saharan African countries, a majority of the workforce earns its livelihood from agriculture. In eight of the countries, two-thirds or more of the

workforce is engaged in agricultural activities (World Bank, 2000). This figure is significant because some three-quarters of the world's poor work and live in rural areas (IFAD, 2001). Hence, war-induced reductions in food production mean income losses and reduced access to food for a large portion of the population, with a heavy impact on the poorest households.

The Food and Agriculture Organization of the United Nations (FAO) adopted a similar methodology to calculate conflict-induced losses of agricultural output in the developing world as a whole from 1970 to 1997 (FAO, 2000b). It determined that such losses in real terms totaled $121 billion (or an average of $4.3 billion annually). Moreover, losses in the 1980s and 1990s exceeded the level of food aid provided to the world's countries. In sub-Saharan Africa, losses in the affected countries over the entire 28-year period were equivalent to 30 percent of their agricultural output. In the 1980s and 1990s, the losses came to 45 percent of all aid received by conflict countries—far exceeding the level of foreign direct investment (see Table 3).

In the absence of war, therefore, it is very likely that a group of very poor African countries would

Table 2. Estimated Numbers of People in Need of Food and Humanitarian Assistance (as of 15 November 2000)

Asia		Africa		Latin America	
Afghanistan Region (Afghanistan, Iran and Pakistan)	400,000	Angola	2,500,000	Colombia	1,800,000
Armenia	170,000	Burundi	704,000		
Azerbaijan	485,000	Congo, Republic of	120,000		
Georgia	182,000	Congo, Democratic Republic of	6,500,000		
Indonesia (W. Timor, Maluku)	996,000	Eritrea	750,000		
Russia (Chechnya)	267,000	Ethiopia	400,000		
Tajikistan	370,000	Guinea/Cote d'Ivoire (refugees)	534,000		
West Bank and Gaza	360,000	Kenya (refugees)	215,000		
		Liberia	453,000		
		Rwanda	40,000		
		Sierra Leone	1,810,000		
		Somalia	350,000		
		Sudan	2,600,000		
		Tanzania (refugees)	440,000		
		Uganda	900,000		
		Zambia (refugees)	210,000		
Regional Subtotal	3,230,000	Regional Subtotal	18,526,000	Regional Subtotal	1,800,000
Grand Total: 23,556,000					

Source: Author's calculations from FAO (2000a); ACC/SCN (2000); USCR (2000); UNOCHA (2000a); and WFP (2000).

have (a) produced more food, (b) generated more secure livelihoods for the population currently mired in poverty, and (c) had fewer children suffer from malnutrition. More of these countries' resources would have been available for investment in both human development and productivity gains among small farmers.

Impact on Vulnerable Groups

Across Africa, displaced and refugee populations in crowded and unhygienic camps prove particularly vulnerable to nutritional deprivation, health problems, and violence. Although civilian women and their dependent children account for 70 to 80 percent of refugees and internally displaced people, men with guns out-compete them for food and sometimes force women to trade sex for rations (Sayagues, 1992).

Children also suffer disproportionately in conflict situations. Not only are conflict and child malnutrition closely correlated (see Figure 2), but conflict subjects children to physical disabilities, psychological trauma, homelessness, and separation from community ties during critical periods in their human development. After prolonged disruption of schooling, young adults in many African countries that have been at war most of their lifetimes find themselves unprepared for farming or any other vocation except fighting, and anchored in no community other than the one of comrades-in-arms. In addition to diminishing the opportunities for young people to acquire skills that can contribute to elevated and more diversified livelihoods, conflict disrupts the education of females—which has been identified as one of the best levers to improve the nutrition of all household members (Messer & Uvin, 1996). Recent International Food Policy Research Institute (IFPRI) research has found that increases in food availability accounted for 26 percent of the reduction in child

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Figure 1. Actual and Peace-Adjusted Food Production Growth in Sub-Saharan Africa, 1970-93

Index of per capita food production (1979-81=100)

■ Actual food production
□ Peace-adjusted food production
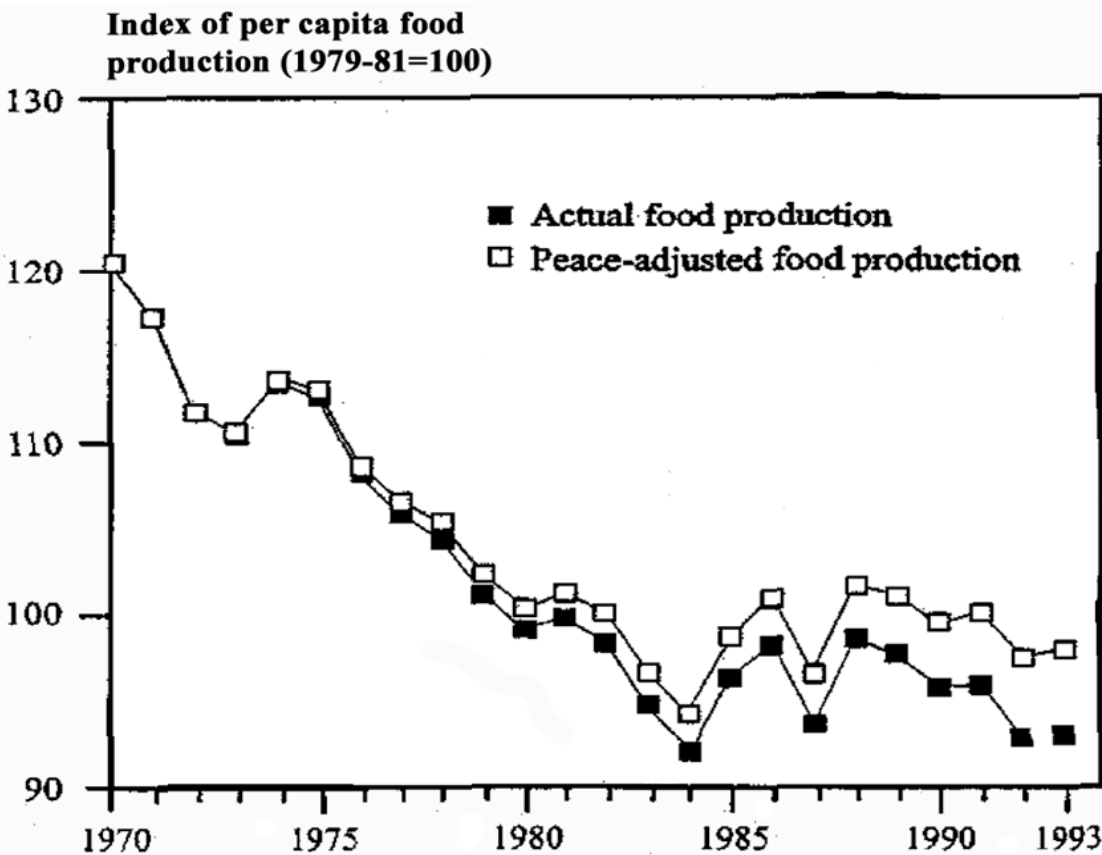
Source: Messer, Cohen & D'Costa (1998).

Figure 2. Food Security, Civil Conflicts, and Child Mortality, 1990-96

Percent of countries in conflict

Deaths per thousand live births

Child mortality rate

Incidence of civil conflict

>50% Undernourished | 38-50% Undernourished | 27-37% Undernourished | 17-26% Undernourished | 8-16% Undernourished | <8% Undernourished
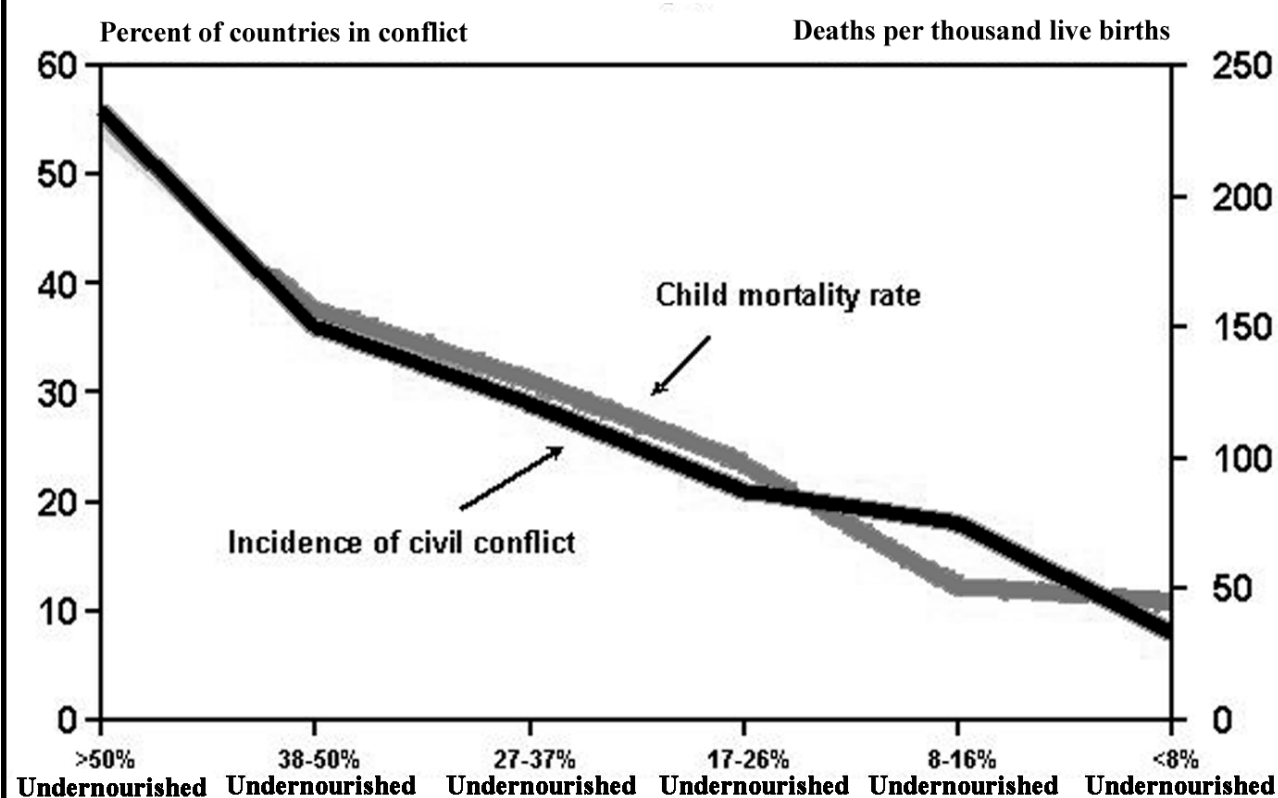
Source: FAO (1999a)

Note: Countries grouped by prevalence of undernourishment.

Table 3. Agricultural Losses and Capital Flows in Conflict-Affected sub-Saharan African Countries ($ billion, current value)

	1980 to 1989	1990 to 1997
Losses	31.2	21.9
Official Development Assistance	50.8	65.7
Foreign Direct Investment	6.0	14.0

malnutrition in developing countries between 1970 and 1995. Increased food availability and female education together accounted for nearly 70 percent of the reduction (Smith & Haddad, 2000). But populations in war-torn countries instead suffer from decreased access to both education and food.

Land Mines

Even after wars have ceased, landmines planted during conflict continue to exact high costs in terms of human life, economic and social development, and agricultural production.[2] Mines are frequently planted

households with at least one mine-affected member is estimated to be 40 percent higher than in non-affected households. In Sierra Leone and Cambodia, one in 10 people has lost a limb to land mines, with serious implications for food production and income-earning capacity. The price of a landmine may be as low as $3, but removing a mine costs $300-$1,000.

HUNGER AS A CAUSE OF CONFLICT

In sum, conflict has an enormous impact on human (food, economic, health, environmental,

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War-induced reductions in food production mean income losses and reduced access to food for a large portion of the population, with a heavy impact on the poorest households.

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in rural areas, limiting access to farmland, roads, drinking water, and sources of firewood. Safe removal of 60 to 70 million unexploded landmines from 70 poor countries in which they are buried could greatly expand agricultural lands—by an estimated 88-200 percent in Afghanistan, 11 percent in Bosnia, 135 percent in Cambodia, and 4 percent in Mozambique. In addition to these four countries, those most severely affected by landmines include Angola, Croatia, Eritrea, Iraqi Kurdistan, Namibia, Nicaragua, Somalia, and Sudan. As of 1998, these 12 countries accounted for about 50 percent of the landmines deployed worldwide.

According to the International Committee of the Red Cross, approximately 26,000 civilians are killed annually or injured by landmines. Landmines and unexploded ordnance (a) reduce productivity of those maimed, (b) reduce agricultural production by making land unsafe to farm and by killing and injuring farmers, (c) limit market transactions because of impassable roads, (d) hamper the reintegration of uprooted people, (e) prevent investment in mine-infested areas, (f) cut off access to water and electricity, and (g) impede access of mobile health care providers. For the estimated 250,000 to 300,000 worldwide survivors of landmine explosions, the costs for adequate medical treatment to return them to full functionality would amount to $2 to 3 billion. Often, it is the most able-bodied members of society—the "breadwinners"—who fall victim to violent conflict and landmines. For Afghanistan, Bosnia, Cambodia, and Mozambique, the probability of food security problems in

personal, community, and political) security (UNDP, 1994)—an impact well beyond the immediate conflicts and combatants. Food insecurity can also contribute to the outbreak of conflict. In the Horn of Africa in the 1970s, 1980s, and 1990s, droughts devastated already food-insecure, politically-oppressed populations, triggering chronic famines and civil wars. Ethiopia is a case in point: in the 1970s the failure of Emperor Haile Selaissie's government to respond to food shortages touched off his overthrow. Famines in the Sahelian nations of Upper Volta and Niger in the 1970s also triggered coups when governments proved unwilling or incapable of responding to these conditions or made only selective responses.

The international community responded to these calamitous conditions through the UN system by strengthening the FAO's Global Information and Early Warning System on Food and Agriculture (GIEWS). It also strengthened alternatives to GIEWS— such as the U.S. Famine Early Warning System (FEWS)—by establishing grain reserves and minimal food-aid obligations for donor nations. The capacities of the World Food Programme and bilateral agencies' capacities to deliver food and development assistance were also expanded. Improved early warning and response (with more technically-advanced use of geographic information systems and satellites plus on-the-ground informants) became part of a deliberate international political strategy to prevent food insecurity and prevent famine or civil disruption. And this strategy was largely successful in preventing drought-induced famines in the 1980s and 1990s.

But the famine experience of Ethiopia in the 1980s demonstrated that improvements in famine early warning are not sufficient to ensure the successful prevention or mitigation of both famines and the possibility that denial of access to food will ignite conflict. Governments must be both capable and politically willing (a) to monitor and assess the resulting information and then intervene, (b) to identify regions and localities where food is lacking, (c) to import food in the form of aid or trade, and (d) to administer programs of relief where food access is severely restricted. This need for responsible political action was raised as well in reviews of famine vulnerability in Africa during the 1980s, which demonstrated convincingly that both the political will to protect food security as well as good governance were necessary for early warning and response to potential famine (Curtis, Hubbard, & Shepherd, 1988, pages 11-27; Berry & Downing, 1994).

For example, food flowed effectively to drought-stricken populations in Botswana, which had political will and sufficient infrastructure to respond. But such factors were missing in Ethiopia, and food flow to famine victims suffered accordingly. Moreover, in the Ethiopian famines of the 1980s, the food insecurity of the victims was not only a consequence of drought and of political oppression. Control over food was part of a deliberate Ethiopian state policy of forced resettlement of the opposition. The government used food aid selectively as a political tool to reward followers and let others starve (J. Clay et al., 1988; Von Braun, Teklu, & Webb, 1998).

Denial of essential food has been recognized as a category of human rights violation and is well established in humanitarian law. Through various UN conferences (such as the 1992 International Conference on Nutrition), the international community has affirmed that it is a basic human right not to starve; and it increasingly tries to intervene to feed the hungry in conflict situations. Beginning in 1991, the United Nations authorized military-humanitarian interventions in war-torn Iraqi Kurdistan, Somalia, Bosnia, and Rwanda (Minear & Weiss, 1993; Messer, Cohen, & D'Costa, 1998). But such interventions carry great risk, as they may further complicate the peace process; when combatants control the flow of emergency food and are being fed, they lose incentives to settle conflict quickly.

The complexities in this and other African cases of protracted civil war (such as Sudan's) suggest that conflict is not an inevitable outcome of environmental scarcities and food insecurity. For conflict to occur, there must be present additional forces: (a) human rights violations; (b) oppressive social inequalities; and (c) cultural values that legitimate violent resistance as an appropriate response to unjust or intolerable conditions, especially those that deny affected populations access to food. Studies such as Uvin's (1996b), which analyzes the steps leading to continuing conflicts in Rwanda, suggest conflict arises as much from perceptions of unfairness as from absolute shortages. This point is also made in historical cases (e.g., Homer-Dixon, 1999; Scott, 1976; Gurr, 1970; and Wolf, 1969). In situations in which economic conditions have deteriorated, people may feel that they have nothing more to lose and so are willing to fight for resources, political power, and cultural respect—i.e., human rights (De Waal, 1997). The trigger condition for violent conflict may be: (a) *natural*, such as a prolonged drought; (b) *economic*, such as a change in price of the principal food (rice in Indonesia) or cash crop (coffee in Rwanda), depriving the rebelling population of its perceived just standard of living; or (c) *political*, such as the denial of access to land or social welfare programs in Central America (Barraclough, 1989; Collier & Quaratiello, 1994).

In addition, riots and rebellions (many of which may not rise to the conflict-fatality threshold used here, but which nonetheless involve a resort to violence) have long occurred in towns and cities subject to food shortages (Crossgrove et al., 1990). Discontent among Parisians and other urban folk over rising food prices and the inadequate government response played a major role in sparking the French Revolution (Lefebvre, 1962). Government efforts to eliminate food subsidies for urban consumers in connection with structural adjustment caused riots and government collapse in Zambia in 1990 (Rakner and Skalnes, 1996). In Indonesia in 1998, the Asian financial crisis triggered a currency collapse that led to urban unemployment, skyrocketing food prices, and protests in urban and rural areas alike. The violence contributed to ending the 30-year reign of President Suharto (Richburg, 1998).

Econometric studies provide additional empirical evidence of a link between food insecurity and violent conflict. These studies find a strong relationship between indicators of deprivation (such as low per capita income, economic stagnation and decline, high income inequality, and slow growth in food production per capita) and violent civil strife (Nafziger & Auvinen, 1997; Collier & Hoeffler, 1998).

Mathematical models developed for a U.S. government study identified high infant mortality—the variable that most efficiently reflects a country's overall quality of material life—as the single most efficient variable for explaining conflicts between 1955 and 1994. Along with trade openness and regime type, infant mortality was one of three variables best correlated with the historical cases studied. It often interacts with lack of trade openness and repressive regimes to trigger state failure (Esty et al., 1995; 1998).

In sum, political and institutional factors in interaction with environmental factors (such as drought and deforestation) are key indicators of potential conflict in Africa: well-being is affected not just by natural disasters, but also by how effectively a regime responds to them. Ineffective responses include inappropriate policies, such as those used by some Sahelian countries in the 1960s and 1970s: they both neglected agriculture and subjected it to disproportionate taxation relative to the allocation of public expenditure received. These policies greatly intensified the impact of the severe 1972-75 drought in the region (Christensen et al., 1981). Other ineffective responses include *unwillingness to respond to disaster*, as in Ethiopia in 1974 or Rwanda in 1993 (J. Clay et al., 1988; Uvin, 1996b), and *deliberate use of food and hunger as weapons*, as in the Horn of Africa in the 1980s and 1990s (Messer, Cohen, & D'Costa, 1998). These examples demonstrate that famine is a result of political choices as well as capabilities (Drèze & Sen, 1989).

Ethnic and Political Rivalries, Hunger, and Conflict

There is a high correlation between a country's involvement in conflict and its classification by FAO as a "low-income food deficit" country. Such countries have high proportions of food-insecure households. And, as already noted, conflict is also highly correlated with high rates of child mortality (see Figure 2), which is a common index for food insecurity.

Nevertheless, a number of analysts have challenged the notion that food insecurity is a causal factor in conflict. Paarlberg, for instance, argues that environmental scarcities such as land shortage, land degradation, and rapid population growth—what he refers to as "eco-Malthusian emiseration"—are not generally a factor in African conflicts. Rather, Paarlberg notes, the level of conflict in Africa has been relatively stable since the end of the colonial era. In his view, "[a] far more convincing explanation for

violent conflict in sub-Saharan Africa starts with the serious geographical mismatch, long noticed on the continent, between post-colonial national boundaries and ethnic boundaries." (Paarlberg, 1999, page 1) More generally, Gleditsch (1998) has pointed out that most conflicts can be sufficiently explained as a result of political, economic, and cultural factors, without reference to environmental scarcities.

In fact, neither viewpoint precludes a food-security connection. Even Homer-Dixon (1999), a leading figure in the environmental security field, concedes that environmental scarcity alone does not inevitably result in conflict. Instead, he stresses that resource constraints can have a profound influence on the social factors that eventually lead to conflict—as when elites monopolize control over scarce resources (such as water, cropland, or forests) and non-elites perceive themselves as unfairly deprived.

As an example of how this works in practice, Uvin (1996b) argues persuasively that environmental factors in general—and food insecurity in particular—critically contributed to triggering the 1994 genocide in Rwanda. Per capita food production and availability had declined dramatically in Rwanda over the preceding decade. The collapse of the world price of coffee in 1985 greatly reduced local and national government revenues and sapped rural households' purchasing power, even as urban job opportunities grew scarce and food prices rose. Deteriorating living conditions made many Rwandans into a ready audience for government appeals to ethnic hatred.

The basic, underlying, and trigger causes of conflict are not exclusively environmental, ethnic, or political-economic, but interactive. For policymakers, the relevant questions are: What finally triggers conflict? And at which points might international diplomats most effectively intervene? Unfortunately, even cutting-edge studies on conflict prevention in Africa focus almost exclusively on the immediate question of where engagement or diplomacy failed (e.g., Zartman, 2001). These studies explicitly do not address the underlying structural causes and thus ignore the crucial politics of food. In contrast to the 1970s, when foundations such as the Carnegie Corporation addressed concerns that the world was entering a neo-Malthusian crisis, today's institutional funders avoid the food-security connection to conflict. Yet the structural conditions of inequality and hunger that were present then persist today and contribute to the underlying causes of conflict. These underlying causal steps connecting food insecurity and conflict

demand more attention.

Moreover, microsimulation studies of the factors and clusters of factors linked to conflict (e.g., Esty et al., 1998) suggest that it should be possible to learn from peaceful cases in which environmental scarcities and food shortages did not spark or incite violence. Some agricultural specialists suggest that the critical factor in this regard is the ability of local people in resource-poor areas to intensify agricultural production or otherwise diversify livelihoods without degrading the environment. Social, cultural, and economic variables (such as proximity to markets or alternative

offer policymakers a better understanding about the resources on which people survive in good years and bad—resources which potentially act as brakes to cycles of hunger and conflict (e.g., Pottier, 1999).

POLICIES TO BREAK CYCLES OF HUNGER AND CONFLICT

Agricultural experts insist that sustainable agriculture and rural development efforts (with an emphasis on small farmers) should be able to help prevent conflict in resource-poor areas and countries

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Even cutting-edge studies on conflict prevention in Africa. . . explicitly do not address the underlying structural causes and thus ignore the crucial politics of food.

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employment opportunities) may also be relevant (Pender & Hazell, 2000). Since the 1960s and especially since the 1980s, food and nutrition policymakers have favored plans and programs that encourage participation by community-based organizations (Marchione, 1999). But there still are few case studies that show how peaceful development activities are mobilized at the community level. Nor are there many studies of how such community organizations can scale-up their activities to widen (a) the numbers of participants; (b) the functional areas they address (e.g., health and nutrition, water, education); and (c) the breadth and strength of their contacts with governments, NGOs, UN agencies, or other sources of technical or financial assistance.

Analysis of community-based organizations can also offer policymakers important insights on local cultures of cooperation, including on mechanisms of conflict prevention (Uvin, 1996a). Such inquiries can expand existing understandings of the causes of conflict or even use the findings of existing studies such as those of Esty et al. (1998) to focus on the role food security has played in cases for which analysis had predicted conflict but peace prevailed. What were the circumstances promoting peace in these "false positive" cases?

Conversely, it would be useful to understand situations in which warfare and violence did not produce food insecurity (for example, after the Rwanda genocide of 1994) even after such an outcome had been predicted. In these cases, ethnographic reports on food-security conditions promise to be useful because they

(Pender & Hazell, 2000). As mentioned above, about 75 percent of poor people in developing countries still live in rural areas, where agriculture is critical to incomes and food security (IFAD, 2001). Broad-based development, which includes both (a) economic growth, and (b) improvement in quality of and access to social and health services, offers the only real antidote to the hopelessness and despair of rural impoverishment. It is also the only real prospect to reverse the injustice and inequality that often leads to violence.

Yet worldwide official development assistance from the principal developed-country donors dropped 21 percent over 1992-97. Aid to sub-Saharan Africa fell 13 percent during 1994-97, and global aid to agriculture plummeted almost 50 percent in real terms over 1986-97 (see Figure 3). While agriculture aid rose in 1998 and 1999, it remained well below levels of the mid-1980s (FAO 1999, 2000b; OECD, 1998-2000).

In addition, global food aid levels fluctuated dramatically in the 1990s (see Figure 4). These levels hit their lows in 1994-96, a period which includes the Rwandan genocide, the beginning of the international war in the Congo, and high global grain prices at the beginning of the implementation of the Uruguay Round Agreement on Agriculture. Subsequent elevated levels from 1998-2000 resulted mainly from domestic market conditions in the United States (the largest donor of food aid), which ties its foreign agricultural assistance to U.S.-produced commodities (Cohen, 2000; Clay & Stokke, 2000).

But even as total international aid has shrunk,

emergency needs have claimed ever-larger slices of this aid because of the proliferation of crises. In 1996, emergency assistance came to 9.5 percent of all worldwide development aid, compared to 3.5 percent in 1987. Forty-one percent of food aid tonnage in 1996 was devoted to emergency relief, as opposed to 10 percent in the 1970s (OECD, 1998-2000; WFP, 2000). Emergency aid is usually necessary to save lives once a crisis occurs. But the relative and absolute reduction in resources available for long-term development assistance signifies lower investments in the kinds of food security, social services, and sustainable livelihood activities that might prevent the outbreak of conflict in the first place. The scarcity of development funds also limits opportunities to link relief and development and move crisis-affected communities beyond reliance on relief aid.

In addition, most war-torn countries have had to deal with the legacy of debt and the burdens of its repayment in the context of structural adjustment. At the macroeconomic level, (a) structural and financial adjustments, (b) debt relief, and (c) the details of balance of payments and negotiations in liberalized trade certainly influence peace as well as poverty (Smith, 1994; Stewart, 1993). The year 2000 International Jubilee Campaign for debt relief took an important step in the direction of forgiving debt, thereby freeing more funds for economic and social programs.

Rethinking Program Implementation

Appropriate project administration—particularly implementation that is conscious of the risk of conflict and that seeks to promote peace—can deter violence (Messer, Cohen, & D'Costa, 1998). But peaceful outcomes require that agricultural investment be carried out in ways that promote peace and not intercommunity or intergroup rivalry over access to new resources. As shown in the case of Rwanda, inappropriately administered aid can exacerbate tensions when would-be beneficiaries perceive unfairness in the distribution of agricultural program assistance (Uvin, 1996b). Non-conflictual outcomes in agricultural programs (as shown in selected case studies in India) usually depend not just on the introduction of new agricultural technologies that

Figure 3. Trends in Aid Funding, 1980-82 to 1995-97 (millions of 1995 US $)

Source: FAO (1999b)
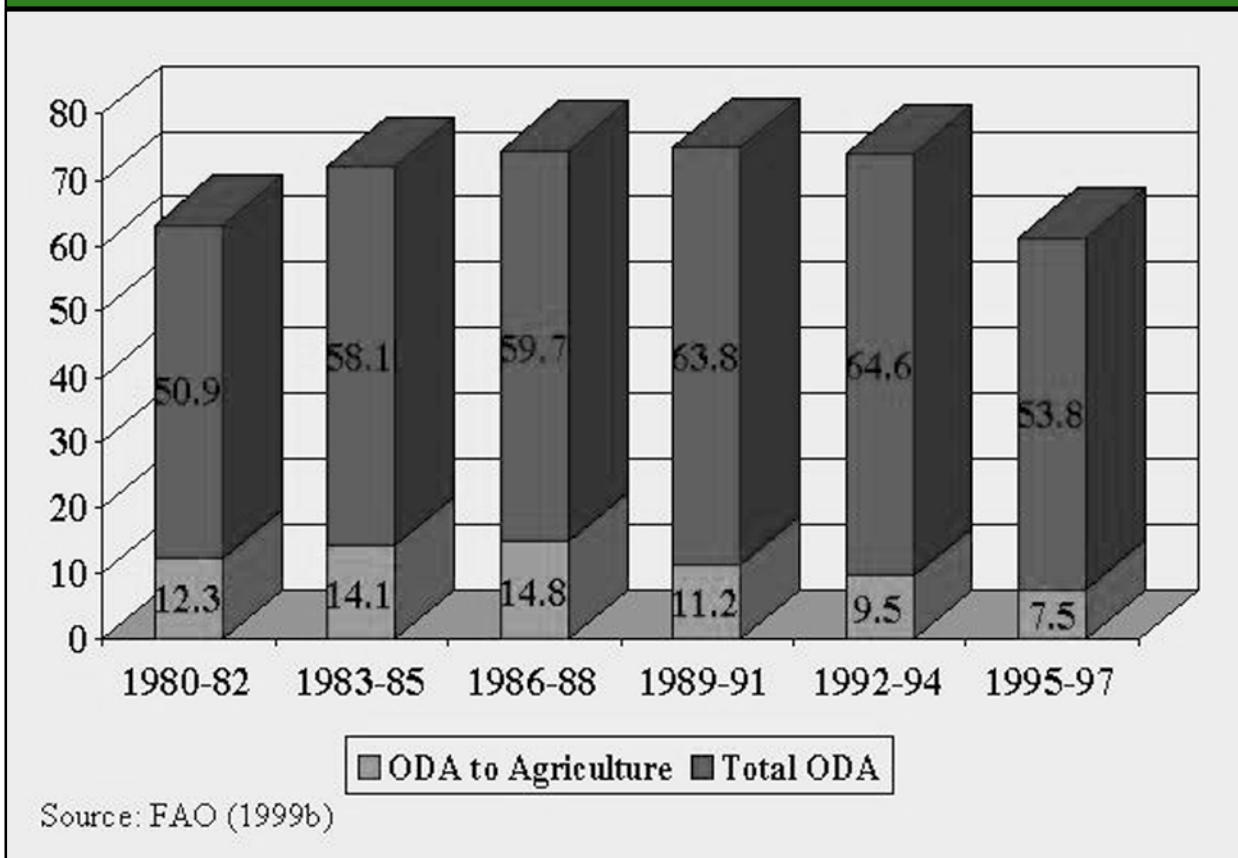
favor growth but also on the construction of social contexts that promote social justice (De Soysa & Gleditsch, 1999; Kerr & Kolavilli, 1999).

It has been argued that Green Revolution technologies, which tended to benefit first the better-off farmers in many Asian communities, also benefited many rural poor people through lower food prices and increased employment opportunities on and off the farm (Kerr & Kolavilli, 1999). In the Indian states of Kerala and Tamil Nadu, agricultural and rural development programs have been coupled with extensive social programs and investment in human resources. In Maharashtra, social programs include state-funded public works employment-programs implemented whenever the danger of famine arises. Such interventions that do not privilege the already-privileged can reduce tensions and arguably have forestalled the types of food riots still prevalent in India as late as 1974. And as an alternative to such Green

that put extra pressure on water resources that may already be a source of tension. Trawick's forthcoming analysis of social conflict over access to water in Peruvian highland communities overrun by the revolutionary movement Sendero Luminoso (Shining Path) shows how higher-level official misunderstanding of local water organizations and competition over access to water pre-disposed certain communities (who were already perceiving unfair distribution) toward violence (Twawick, in press).

Institutional approaches to land and resource distribution are also relevant to peaceful or more conflictual outcomes. In El Salvador, the government's unwillingness to institute and carry out peaceful transfers of land from large to small holders in the 1980s contributed substantially to the level of violence (Barraclough, 1989). In both these cases, violations of land and water rights were closely linked to the violation of the right to food, pushing people toward

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Worldwide official development assistance from the principal developed-country donors dropped 21 percent over 1992-97.

Revolution or bio-revolution agricultural development strategies, some agroecologists (including those working in conflict-prone areas) are supporting farmer-led efforts to replace chemical-intensive with alternative agroecological farming methods. Ecological, economic, and sociocultural factors are combined in this holistic approach (Thrupp, 1998; Thrupp, 2000; and Altieri, 1995).

When international, national, and local government or non-government policies and projects make equity an important consideration in rural development or relief activities, it can make an enormous difference in the effectiveness of such activities (De Soysa & Gleditsch, 1999; Drèze & Sen, 1989). In the case of relief-to-development activities in conflict-prone situations, policymakers can also promote agricultural and other programs that foster or demand cooperation among rival communities or community groups—thus avoiding the kinds of negative competition for development aid that analysts have cited as one of the causes leading to violence in pre-1994 Rwanda (Anderson, 1999). In situations where social infrastructure is fragile or water availability is low, project design can take such limitations into account, and avoid reorganization or delivery-of-resource proposals that demand highly-orchestrated community management structures or

violent conflict and enmeshing them in ongoing cycles of hunger and conflict.

Advocates for the human right to food or subsistence rights as a basic human right are quick to point out the close linkage between food insecurity, human rights abuses, and conflict (e.g., Messer, 1996b). And even some who do not accept the equality of such economic rights with traditional civil-political rights can be interpreted as accepting (a) the principle that everyone has a basic human right to adequate food and nutrition with dignity, and (b) the connection between abuse of civil-political rights and vulnerability to hunger (e.g., Marchione, 1996; De Waal, 1997; and Sen, 2000). The umbrella of human rights thus provides an overarching framework for planning and evaluating development, particularly agricultural policies and programs.

Conclusion

Linkages between conflict and food insecurity have become increasingly evident in the post-Cold War era and are being addressed by peace and food-security advocates both inside and outside of government and international agencies. The 2001 reorganization of USAID into interactive "pillars" that focus on "economic growth and agriculture" as well as on

Figure 4. Global Food Aid Deliveries
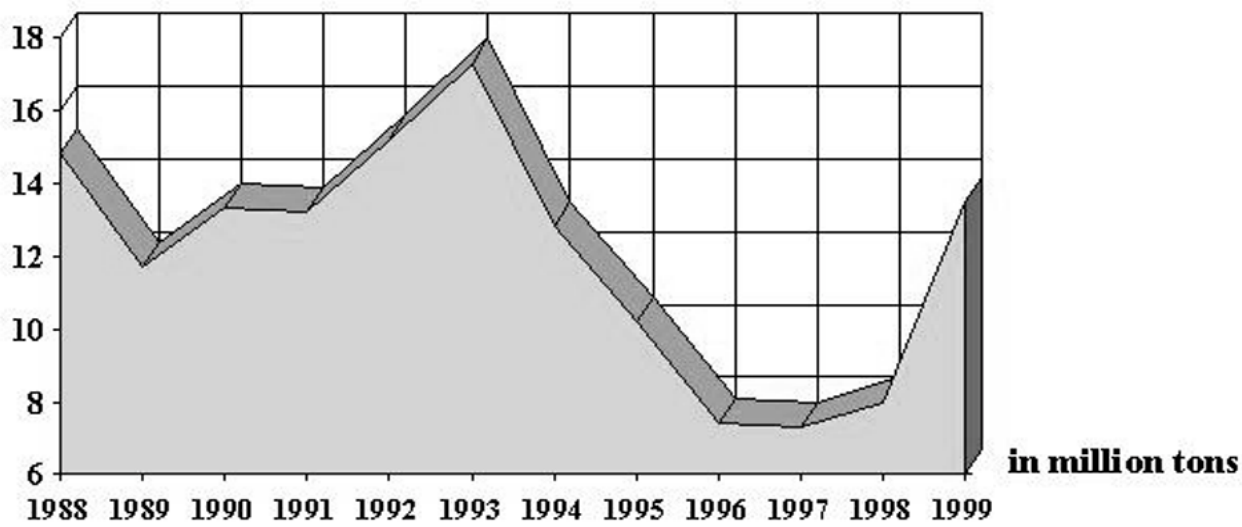
Source: www.wfp.org/reports/faf/98 (Data for 1999 are estimated).

"conflict prevention" suggests that the United States may be widening its scope of action to address complex food-security problems. In addition, conflict's explicit link to the human right to adequate food and nutrition with dignity has received additional credence since the World Food Summit (1996) made implementation of this right one of its priority objectives.[3] Research and activities supporting both the "development" and "human rights" approaches can also be found in increasing numbers of U.S., bilateral, and international agency products and activites:

• The US National Intelligence Council's *Global Trends 2015: A Dialogue About the Future with Nongovernment Experts* (NIC, 2000-02, page 26) highlights the numbers of chronically malnourished people that will increase in conflict-ridden sub-Saharan Africa as well as the potential for famine where conditions of political repression and internal conflict coincide with natural disasters.
• USAID has focused on promoting food security and peace in the Greater Horn of Africa (USDA, 2000).
• As a result of the World Food Summit and in collaboration with donor government aid agencies, NGOs, and International Agricultural Research Centers (IARCs), United Nations agencies have launched the Food Insecurity and Vulnerability

Information and Mapping System. This project has the goal of contributing to famine prevention and long-term food security through improved data quality and analysis (FAO, 2000c).
• The UN Administrative Committee on Coordination/Subcommittee on Nutrition has enhanced its efforts to monitor the nutrition status of conflict-affected people (ACC/SCN, 2000).
• The World Institute for Development Economics Research of the UN University has conducted extensive research on the causes of famine and conflict (Drèze &Sen, 1989; Nafziger & Auvinen, 1997).
• IARCs have provided seeds from their extensive germ plasm collections to assist reconstruction efforts in post-conflict situations (Pinstrup-Andersen, 1998).
• The U.K. Department for International Development has put emphasis on assuring secure livelihoods in both development assistance and conflict aid (DfID, 1997).
• The European Union has increasingly made use of developing-country food in its food aid programs to enhance the linkages between food aid and local, regional, and national food security (Clay & Stokke, 2000).

Donor agencies, academic institutions, and NGOs involved in relief and development have also been

examining how better to link emergency aid programs to longer-term development efforts. Many developing country governments have enhanced their emergency response capabilities. The participation of civil society—and especially of the affected communities in such activities—is critical. More positive scenarios for food, agriculture, and the environment are possible if peace can be (a) protected where conflict is imminent, (b) achieved where conflict is active, and (c) sustained where conflict has ceased. Food security and development programs must include conflict prevention and mitigation components so that considerable agricultural and rural development aid is not consumed in conflict (as it was in Somalia, Rwanda, Ethiopia, Indonesia, and Colombia). Savings from conflict avoidance might be calculated as returns to aid.

Reciprocally, relief and post-conflict reconstruction programs need to have food security and agricultural and rural development components if they are to help break the cycle of hunger and conflict. Such a transformation of development and relief efforts requires new policies and programs. Government planning and aid programs should include "peace" considerations and conditions, assessing the likely impact of policies on food security, equity, and poverty alleviation. Such planning and programs must be grounded in democratic processes, the participation of civil society, and the rule of law. When development agendas combine peace and food-security objectives, they will move beyond encouraging economic growth and good governance. They will then be able to assist in the building of states that are also capable of responding to emergency situations while ensuring everyone's access to adequate food. **W**

ENDNOTES

[1] Following the Conflict Data Project at Uppsala University in Sweden, minor conflicts are those which result in at least 25 battle-related deaths per year, but fewer than 1,000 deaths during the course of the conflict. Major conflicts result in at least 1,000 total deaths (Wallensteen & Sollenberg, 2000). Our earlier work on food wars (Messer, 1996) followed Sivard's (1996) definition of war, which focused solely on conflicts involving more than 1,000 deaths.

[2] This section draws on Cohen & Feldbrügge (2000) and U.S. Department of State (1998).

[3] See Ziegler (2001), especially paragraphs 27 and 74.

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Environmental Stress and Human Security in Northern Pakistan

By Richard A. Matthew

Abstract

Environmental and social factors that are generating high levels of conflict and insecurity in Northern Pakistan. Several factors make this case an important subject for analysis and discussion: (a) the strategic location of the region; (b) the potential for far-reaching and even global consequences should conflict spill across the borders and into countries such as Afghanistan and India; and (c) the similarities between this case and many others in the world. The article concludes with policy suggestions for both domestic and foreign parties concerned about the situation.

Located in the heart of the planet=s most dramatic confluence of mountain ranges, Pakistan=s North-West Frontier Province (NWFP) faces environmental challenges that are unprecedented in the area=s turbulent history. In light of the growing literature linking environmental change to a variety of security problems, how the people of the NWFP address these challenges may be a matter of regional and even global concern.[1] An intensification of violence and conflict in the NWFP[2] would be particularly alarming given the possibility of spillover effects into any or all of the following regions:

- an Afghanistan to the north and west that is reeling from decades of invasion, war, political extremism, and economic collapse;
- the conflict-prone valleys of Kashmir and Jammu to the east—disputed territories that have soured India-Pakistan relations since 1947;
- the rest of Pakistan to the south, made up of three provinces (Baluchistan, Punjab and Sind), each of which is confronted with serious political and economic problems and plagued by persistent civil unrest.

These three countries in turn lie on the borders of China, Russia, and Iran. Nuclear weapons, population pressures, environmental stresses, economic problems, and group-identity conflicts afflict much of this part of the world. What happens in this geopolitically strategic area is of importance both regionally and worldwide.

The situation in the NWFP is also of direct concern because it presents a problem that is either evident or emerging in many other vulnerable and volatile regions.[3] In many of these cases, a set of interconnected variablesCincluding rapid population growth, repeated economic failures, and weak and ineffective institutionsCpromote practices that simultaneously damage the environment and cause the steady deterioration of sustainable livelihoods. In consequence, social systems become mired in conditions that are difficult to change and highly conducive to perpetual poverty, infectious disease, and multiple forms of insecurity and violence.

As Pakistan enters the 21st century, its future, especially that of its northern region, looks bleak. Solving the complex challenges it faces will require financial and technical assistance from the North as well as great internal resolve to reform corrupt political processes, bolster the economy, and inch forward carefully-conceived—(but generally ignored)—plans for sustainable development.[4] Success in northern Pakistan could generate a valuable planning and policy

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model that might be adapted to help address similar problems elsewhere in the world. The social effects of failure, however, could spill across Pakistan=s borders, adding to the already sizable stockpile of regional challenges and tensions.

History and Geopolitics

The most prominent topographical features of the NWFP are the high peaks of the Hindukush and Himalayas that define the northern part of the province. These magnificent mountain ranges give way to the fertile Peshawar Valley, irrigated by the Kabul and Indus Rivers. Still further south, the province terminates in a series of alluvial and semi-arid plains that run on into the provinces of Punjab and Baluchistan.[5]

The 17 million people of the NWFP are generally poor and uneducated (see Table 1), although pockets of great wealth exist and many government officials have advanced degrees, often from European or North American universities. Fifty percent of the region's population is Pashtun; at least another six million Pashtun live across the border in Afghanistan.[6] In the words of the Pashtun political leader Imran Khan, his people "are one of the world's great warrior races" (Khan, 1993, page 3). Martial values shape the culture; most people are well-armed, and violence is an accepted way of restoring honor and resolving disputes (Khan, 1993, pages 1-12, 33-34).

The legacies of a colonial past weigh heavily on this region.[7] The British arrived in the late eighteenth century with hopes of creating a buffer state that would keep Russia out of Afghanistan. Britain's "Great Game" began with the first Afghan War (1838-42) and continued for over a century. When the British discovered that the Pashtun were virtually impossible to defeat in battle, they focused on intensifying existing discord among feuding Pashtun clans. For example, in 1901 the British introduced arbitrary divisions into the region by rewarding some clans with the semi-autonomous Tribal Areas that today run along the border with Afghanistan.

Unable to gain control over the Khyber Pass (a potentially lucrative trade route linking South Asia to the Middle East and Europe), the British turned their attention to cutting down the vast softwood forests of blue pine, fir, and spruce that covered much of the region. They established a forestry service dedicated to logging, and a highly centralized political system propped up by bribery and military force. In the south of the province, they oversaw the construction of sprawling and inefficient irrigation systems, access to which became a vital part of the political economy of bribery that was established to facilitate colonial rule. Deforestation and irrigation became the twin engines of environmental stress (see van Dijk & Hussein, 1994, page 35).[8] Today, soil erosion, waterlogging, and flooding are among the serious problems whose roots can be traced to the economic practices of the colonial era (see van Dijk & Hussein, 1994, pages 34-35; IUCN, 1997, pages 31-37).

The British allowed the local *jirgas* (or councils of elders) to manage routine affairs and resolve most local conflicts, a decision that ensured the continuation of a high level of clan identity and autonomy. When the British left in 1947, northern Pashtun clans were given the choice of independence or joining the new patchwork state of Pakistan. Those in the valleys of Kashmir and Jammu elected to recover their autonomy—and immediately became the targets of Indian and Pakistani expansion plans. The rest formed the NWFP.

Throughout contemporary Pakistan, local identities remain powerful. Political elites generally rely on support from those rural areas and clans with which they are associated. Ethnic, religious, provincial, and national constructions of identity are rarely harmonized except around a small handful of highly symbolic issues (such as the future of Kashmir and the possession of nuclear weapons to balance India's atomic arsenal). On most matters, competing identities pull Pakistanis in different directions, and the more local forces tend to be dominant.

This sense of being separate and distinctive is especially acute in the NWFP, which is often characterized by Pakistanis as a wild and remote place akin to Corsica or Sicily in Western Europe (see Khan, 1993). It is a sentiment that is reinforced by the province's political system—for, unlike the rest of Pakistan, the colonial governance structures of the NWFP have remained more or less intact. The

Map 1. Pakistan

virtually omnipotent Political Agent (provincial governor) is now selected in Islamabad rather than London, but the office continues to rule through force and bribery while leaving many matters in the hands of local elders. Political corruption is as evident throughout the NWFP today as it was prior to 1947. Civil strife and acute violence are endemic. And despite the efforts of some visionary directors, the forest service has had limited success in making the transition to sustainable forestry practices.[9] The lack of change in this region may in some measure be due to the fact that Pakistan is 60 percent Punjabi. Many Pashtun believe that during the first decades of Pakistan's existence, efforts to build a nation-state were focused largely on the more populous central and southern parts of the country—a process that tended to marginalize them and benefit the Punjab majority.

Recent external pressures have added another layer of difficulty to the challenge of reforming the NWFP's colonial legacy of corruption and exploitation. In particular, following the Soviet invasion of Afghanistan in 1979, the NWFP became the staging ground for the first multinational jihad since the Middle Ages.[10] *Mujahidin* flocked to the capital city, Peshawar, from the Middle East, Africa, and Asia. The U.S. Central Intelligence Agency provided $3 billion to support anti-Soviet forces in the province (Weaver, 2000, page 34). Virtually overnight, 3.5 million Afghan refugees crossed the border into northern Pakistan. Gradually, they were settled into 384 campsCthe majority of which were located on marginal lands in the NWFP. The refugees brought weapons, livestock, and small

Map 2. The Provinces of Pakistan
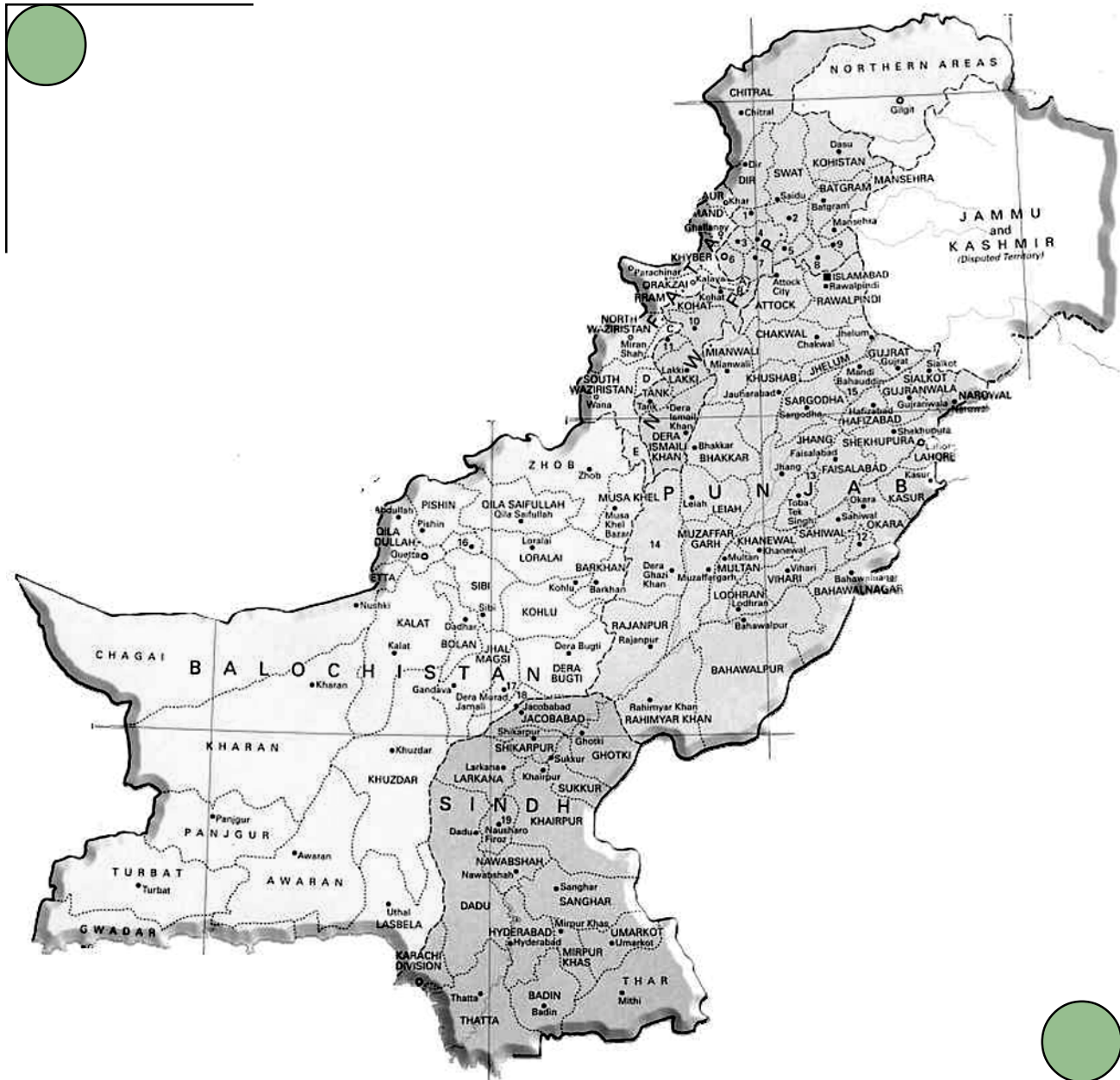
amounts of gold, but had precious little knowledge of how to manage the fragile resource base on which they would now depend (see Hanson, Matthew, & Aziz, 2000).

Throughout the 1980s, the quantity of small arms in the NWFP grew exponentially as the Afghan war raged on its borders. Drug trafficking became widespread as refugees struggled to survive and holy warriors struggled to fund their resistance to the better armed Russians (Weaver, 2000). The Taliban, educators who ran conservative religious schools for Afghan refugees, became a significant political force—one that in the mid-1990s would gain control over most of Afghanistan.[11] And the natural environment of the NWFP began to deteriorate even more rapidly than before under the added burdens placed on it.

In brief, rapid population growth during a period of instability and conflict overwhelmed political and economic arrangements that were fragile and inefficient from the outset, creating conditions in the NWFP that were favorable to environmentally unsustainable practices. This volatile mix of social and ecological factors now fuels conflict and violence in the province, a situation that raises concerns throughout the region.

AN EXPANDING CRISIS

The model presented below is not intended to be a comprehensive account of all of the variables and relationships in the NWFP that may lead towards either conflict and violence, on the one hand, or cooperation and security on the other. Instead, the model (based on information gathered through extensive interviewing and travel throughout this region in 1999) seeks to highlight elements that appear to be most determinative of the region's current vulnerabilities and threats to human security (see Hanson, Matthew, & Aziz, 2000).

At the core of this model are reinforcing

Table 1. Basic Facts about Pakistan and the Northwest Frontier Province (NWFP)		
Category	NWFP	Pakistan
Total Area (sq. km.)	74,521	803,940
Population (millions, 1998 est.)	16.5	135.1
Literacy Rate	17%	36.4%
Population Growth (1996 est.)	3.2%	2.8%
Per Capita Income (1996 est., U.S. dollars)	$200	$470
Pop. Living in Poverty (1996 est.)	20%	34%
Unemployment (1996 est.)	N/A	34%
Refugees (millions, 1999 est.)	1.6	2
Forest Cover	6%	5%
Grazing Land	23%	6%
Arable Land	19%	27%

Source: *The New York Times Almanac* (1999); IUCN (1997); IUCN (1998). NB: data are highly inconsistent across various sources

relationships among (a) unsustainable livelihoods, (b) the martial aspects of the culture, and (c) the rate and intensity of violence and insecurity. The province's growth in unsustainable livelihoods is in turn a product of external forces, population pressures, environmental stresses, and weak institutions—variables that tend to be highly interactive. Because the variables that render people vulnerable and create conditions conducive to conflict and violence often reinforce each other, it is difficult for policymakers and analysts to plot a course out of this situation without a high level of political resolve, considerable financial and technical resources, and strong local support for a range of interconnected goals.

To impart a sense of the challenges facing the NWFP, it is important to briefly describe each of the key variables.

External Forces

External forces affect all aspects of the crisis scenario building in the NWFP. These forces include the structural and institutional legacies of the period of British colonialism as well as the wide-ranging effects of the Soviet invasion into neighboring Afghanistan. More immediately, Pakistan's ongoing rivalry with India over Kashmir is especially relevant because the NWFP serves as the staging ground for Pakistani involvement. It is not coincidental that tensions in Kashmir have been greatest since 1989, when the Soviets were expelled from Afghanistan, and many of the mujahidin who had fought the Soviets remained in the area.

The current dire situation in Afghanistan is also significant. Many residents of the NWFPincluding some 1.6 million refugees—have deep cultural ties to Afghanistan, as well as important commercial links to that country (links that that include drug trafficking and other illegal activities). Anecdotal evidence suggests strong ties between some Pakistani elites and the Taliban government (see, for example, Marsden, 1998, page 128). Early in 2001, the civil war in Afghanistan (between the Taliban and the Northern Alliance) escalated, while drought and cold contributed to widespread famine in the country. The Taliban has also alienated further the world community by destroying two ancient Buddhist

Table 2. Key Dates in Pakistan's History

Year	Event
1940	Lahore Resolution calling for an independent Islamic State
1947	Independence and partitioning of sub-continent
1951	Prime Minister Liaqat Ali Khan assassinated
1956	Proclamation of Republic; first constitution drafted
1958	Military coup
1960	First elected president
1965	India-Pakistan War
1969	Military coup
1971	India-Pakistan War; East Pakistan secedes to become Bangladesh
1973	Constitution adopted
1977	Military coup
1985	Elections
1998	Testing of five nuclear devices
1999	Fighting intensifies in Kashmir and Jammu; military coup
2000	Government launches aggresive anti-corruption campaign

statues. In these volatile conditions, many Afghans have attempted to flee into Pakistan, a flow that both governments have sought to cut off and even reverse, adding frustration and uncertainty to a profoundly desperate situation.

Finally, endemic corruption, the drug trade, and political extremism (as well as allegations that some Pakistani military leaders are training and funding terrorists) are among the factors that have given the region a very negative image in the Western world (Weaver, 2000). In combination with U.S. sanctions against Pakistan for its nuclear weapons testing, these factors have resulted in very little assistance or capital of any kind being available for the NWFP.

Population Growth

Population growth in the province as well as in Pakistan generally has been fueled by the influx of Afghan refugees, cultural preferences, and poverty. As in many developing countries, the growing population tends to be poor and landless; hence, it is compelled to settle in environmentally marginal areas such as urban ghettos or the steep sides of mountains. Not only is it difficult to eke out an existence in such environments, but marginal lands are often contaminated by pollutants and more vulnerable to natural disasters such as flooding. In the capital city of Peshawar, for example, infrastructure for sewage and waste treatment has not kept pace with population growth, and exposure to contaminated water is virtually universal.

The toll on the fragile alpine environment further north also has been enormous. Under unprecedented population pressures, its forests are being decimated to provide fuel and shelter.[12] In consequence, topsoil is easily removed by wind erosion and flooding, reducing agricultural productivity and forcing people to rely heavily on food imports from the south. This degradation is a serious concern in a cash-poor province with about 0.44 hectares of land available per person, only about half of which is productive (that is, available for agriculture, grazing, or forestry).[13] This amount of land is approximately 10 percent of the area needed to support consumption in the most efficient developed countries such as Japan, and about 4 percent of the per capita area currently exploited by residents of the United States (Rees, 2000, page 84). Both population growth and environmental degradation reduce the amount of ecologically productive land available per person, resulting in a dire Malthusian scenario of scarcity. In this light, it is

hard to be optimistic about the prospects for developing sustainable livelihoods in the region.

Weak Institutions

Weak institutions exist throughout the province. Those created by the British and sustained through bribery and force have persisted, and those introduced by the Pakistani government since 1947 have been equally inefficient and corrupt. Local institutions such as the *jirga* are not well suited to handling problems of the magnitude faced by the NWFP. Based on over 70 interviews conducted in the province in the summer of 1999, it appears that distrust of the legal system and disillusionment with politicians and civil servants are common sources of anger and frustration in the NWFP. [14] For many people, the only way to resolve pressing conflictsCsuch as those related to property rightsCis to take matters into one's own hands, an approach that often involves high levels of violence. Weak institutions make it extremely difficult to plan and build infrastructure or to create jobs; they also tend to encourage unsustainable practices.

Environmental Stress

Environmental stress in the NWFP is widespread and severe. Polluted water and air in Peshawar, water shortages in much of the south, unsustainable forestry in the north, and land scarcity everywhere are among the environmental problems plaguing the region.[15] External pressures, population growth, and weak institutions simultaneously enable destructive practices while also making it very difficult to implement effective conservation management. This state of affairs particularly frustrates local authorities and environmental specialists who have invested considerable time and effort in developing the *Sarhad Provincial Conservation Strategy* for the NWFP (IUCN, 1996). Based on *Agenda 21* guidelines, this strategy is a well-informed, highly sophisticated, and widely ignored blueprint for sustainable development in the province. It focuses on the importance of developing a holistic approach that involves extensive community participation to improve governance structures, alleviate poverty, and improve education in order to make possible long-term sustainable development. The *Sarhad Provincial Conservation Strategy* places special emphasis both on addressing the challenges evident in urban environments and in promoting natural resource management. According to the authors of the report, higher levels of participation, better environmental legislation, and

Figure 1. Model of Environmental Stress and Human Security in the NWFP
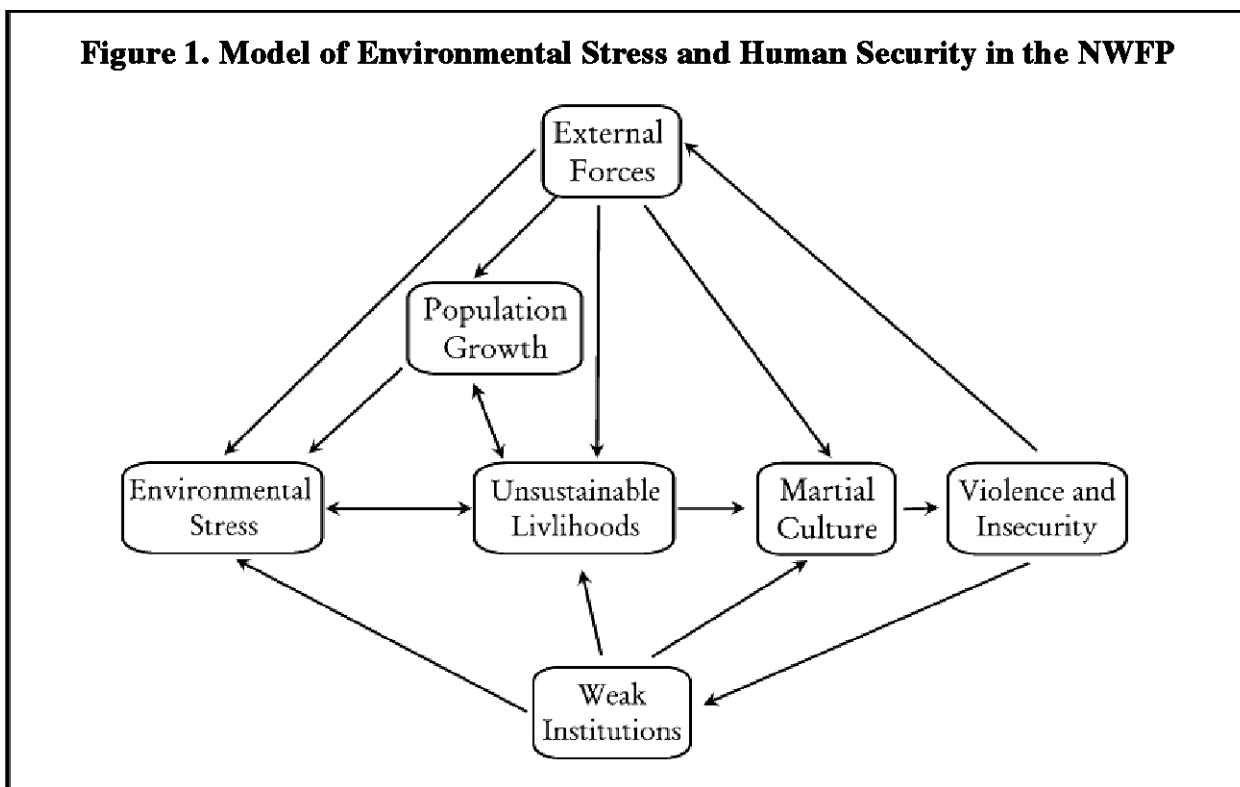
greater governance capacity stand out as urgent objectives for the province.

Unsustainable Livelihoods

Unsustainable livelihoods are the most obvious result of the interactions of the variables described above. Although official figures are not available, direct observation and field interviews suggest that large numbers of men are unemployed throughout the region (Hanson, Matthew, & Aziz, 2000). Some seek casual labor in distant cities such as Karachi; others venture abroad to work in Middle Eastern oil fields. Still others engage in illegal activities such as smuggling and drug trafficking. Many are compelled to draw down scarce resources for fuel and irrigation at unsustainable rates. Poverty encourages large families: they appear to be a rational strategy for minimizing economic risk by allowing families to maximize the household=s economic diversity by sending members to work abroad or in cities in case local means of support fail. Nonetheless, unemployment and uncertainty prompt some men to gravitate towards the blame-casting critiques and promises of political extremists. And everywhere one sees growing signs of resentment towards the refugees, who are constantly accused of working illegally and stealing.[16]

Martial Culture

Martial culture is not a necessary variable for linking environmental stress to violence and insecurity, but it is a prominent feature of the NWFP. If the conditions described above were removed, the level of violence in the region would be kept in check by time-honored cultural restraint mechanisms (well-described in Khan, 1993, pages 15-46). But in the current context of uncertainty and stress, such cultural constraints are far less effective. Cities and villages in the province can and do erupt into mobs of angry, armed men. Calls to liberate Kashmir and Jammu reach receptive ears.[17] Even Pakistan's nuclear tests rally great support, perhaps for the message of defiance they send across Pakistan=s borders.

Violence and Insecurity

Violence and insecurity have long been features of the NWFP, but these features are now exaggerated by the negative forces outlined in this analysis. Given the volatile geopolitics of the region, this crisis is not a condition that can be ignored without great risk. Today's NWFP is trapped in a system of reinforcing negative relationships. A failure in one area is quickly transmitted to others. The conditions for a large-scale disaster are in place.

There are several hot spots in the NWFP, each of which has the potential to erupt into violence, sink further into poverty, push inhabitants into illegal or unsustainable livelihoods, or force people to migrate.

Urban Centers

Approximately 1.3 million people (including some 500,000 Afghan refugees) live in the NWFP's capital city of Peshawar. Once known as the "city of flowers," Peshawar's infrastructure has been overwhelmed by an annual population growth rate of 4.6 percent. Raw sewage (only one-third of which is treated), industrial waste, fertilizers, and pesticides pour daily into

for example, is based on a system of entitlements established by the British in 1905, and relies non a collapsing irrigation works that is choked with sediment. The Daran Reservoir has also shrunk by 60 percent since its completion in 1962 because of siltation, and the system of canals that divert water from the region=s principal rivers (the Kurram, the Kabul, and the Gambila) is plagued by sediment and must be dredged frequently. The end result is that a small number of families granted unlimited rights to water by the British use this customary entitlement as the basis for continuing to monopolize large quantities of water (as well as to control most of the farmland), while an increasingly restless majority experiences chronic water shortages. The costs of

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Population growth, environmental degradation, land tenure, and poverty are clearly interrelated in the NWFP and constitute a multi-faceted policy challenge.

Peshawar's fresh water system. Approximately 40 percent of deaths in the city are linked to water quality problems. Air pollution is also severe because of toxic vehicle and kiln emissions (brick kilns typically burn car tires). In addition, some 60 percent of solid waste in Peshawar is not sent to landfills but accumulates in alleys and abandoned fields. Since 1979, Peshawar has served as a staging ground for the *mujahidin* as well as the hub of the Golden Crescent drug trade and a bustling center for smuggled goods. High unemployment and growing resentment over the continuing presence of Afghan refugees add to the general instability of the city.[18]

Agricultural Areas

Many central and northern districts and villages of the NWFP have relied on old growth forests to provide essential ecological services such as flood control as well as commodities like fuel and building materials. Today, extensive logging is causing hardship as well as widespread and often violent conflict over property rights; according to unofficial government sources, as much as 90 percent of NWFP forest rights are in dispute. Ineffective conflict resolution mechanisms, a sluggish economy, and ideological extremism further incite the large, young, and often unemployed citizenry to diffuse and often criminal violence.

To the south, tensions are growing around water scarcity and social injustice. Water allocation in Bannu,

building more just and efficient water distribution systems have so far been deemed exorbitant by local authorities, although plans to build a new dam on the Kurram River are under review.

Throughout the agricultural regions of the NWFP, population growth and environmental stress (together with social conditions perceived as unfair, corrupt, and inflexible) are the ingredients of potentially violent crisis.

Border Region/Tribal Area

The 800-mile border between the NWFP and Afghanistan has historically been an explosive place, and the legacies of British imperialism and the Afghan-Soviet War continue to haunt this region. As elsewhere in the NWFP, the British set up inefficient irrigation systems and large-scale timber harvesting operations that have resulted in salinization, waterlogging, soil erosion, and flooding. In the wake of the Soviet invasion, millions of landmines on the Afghan side of the border, political uncertainty, civil war, and a chaotic Afghan economy are factors preventing refugees from returning. To survive, these refugees cultivate poppy, produce heroin, and smuggle a wide range of goods. Meanwhile, untreated sewage and industrial wastes dumped into the Kabul River from many sites (especially the cities of Kabul and Peshawar) take a further toll on the environment. The Kabul River has levels of biochemical oxygen demand (BOD), chemical oxygen demand (COD), coliform, nitrites,

nitrates, sulphates, and sulphides that all pose serious health risks. Again, in an unstable social context, rapid population growth and environmental degradation are creating high levels of human insecurity.

Refugee Camps

The approximately 200 refugee camps located throughout the NWFP must also be considered hot spots. The psychological stresses of living in such miserable and inhumane conditions for two decades make these heavily-armed camps a source of great concern. As many as 1.6 million individuals in the province continue to live as refugees, many of them born and raised in the camps. With little or no formal education and few livelihood options, they constitute a tremendous challenge to the future stability of the region. Accurate information is difficult to obtain, but it is widely believed (both in the region and in the international community) that some inhabitants of the refugee camps are involved in the conflict in Kashmir, have links to the Taliban government in Afghanistan, and engage in illegal activities such as drug trafficking (Weaver, 2000). Moreover, tensions are growing between refugees and local Pakistanis who have accused the visitors of taking over the transportation sector, working illegally, and committing property and other crimes. Officially, the governments of Pakistan and Afghanistan would like the refugees to be repatriated. But this has not been an easy policy to implement, especially given the economic and other hardships in Afghanistan. In short, the refugees are part of the network of stresses plaguing the region, one that will have to be managed carefully until resettlement becomes viable. The prospects for violence within the camps, emanating from the camps, or aimed at the camps are considerable and probably increasing.

SCENARIOS FOR THE FUTURE

How might the forms of human insecurity discussed above play out in the NWFP in the years ahead? At least four scenarios are plausible.

Implosion

If traditional livelihoods and social systems erode and alternatives do not develop rapidly enough to alleviate growing fear and anger, the province's citizens might revolt against authorities. Violence in one part of the province might trigger violence elsewhere,

leading to a general collapse of the economy.

Projection

Conversely, local fears and anxieties might be channeled into violence directed against the Afghan refugees or against India in Kashmir and Jammu. The conflict in either case could rapidly spiral into a major catastrophe. Although the leaders of Pakistan and India have agreed to meet with the objective of resolving the dispute peacefully, the negotiations have been slow to take shape, and, to date, there is little basis for optimism.

Intervention

The outside world might decide to escalate its level of involvement in the province by combating the area's drug trade or other criminal activities. Intervention could be indirect (as has already happened on a smaller scale in the case of drug trafficking, when Pakistan's national government was pressured to apply force itself). However, intervention could also be direct.

Adaptation

Innovative, committed, and forward-looking groups in the NWFP might succeed in efforts to: (a) improve resource management; (b) promote sustainable development; (c) build educational and other infrastructure; (d) establish effective conflict-resolution mechanisms; and (e) address such thorny issues as property rights, refugees, illegal livelihoods, and Kashmir. Various groups including the International Union for the Conservation of Nature (IUCN), the Aga Khan Foundation, and the Sustainable Development Policy Institute (SDPI) are already experimenting with reforestation and alternative energy sources such as mini-hydroelectric plants. They are setting up cooperatives to develop the fruit and nut industry, encourage tourism, and empower women. And they are encouraging dialogue and cooperation among religious elites, elders, landowners, refugees, and government officials. Peaceful change cannot be ruled out as a scenario of the future.

CONCLUSIONS AND RECOMENDATIONS

What steps might promote conditions conducive to adaptation and stability rather than violence and conflict? While there are rarely simple solutions to complex problems, several actions can be suggested as priorities.

Brick kilns burning old car tires add to the high concentration of particulates in the air.

Refugee Camp

Photos by Richard Matthew

For External Parties

Avoid stereotypes and negative images of the region. They have little analytical value when they are stripped of historical context, and they are entirely misleading when they are used to characterize an entire population. For instance, simplistic, uncritical accounts of Marxism guided much analysis during the Cold War, generating conclusions about threats and alliances that in retrospect were mistaken or exaggerated. These poor analyses led to serious distortions of the political dynamics of places such as Chile under Salvador Allende and Nicaragua under the Sandinistas. They also led to costly policies that all too often supplied arms to squads of corrupt elites that, although espousing strong anti-communist views, were in fact committed to little more than personal aggrandizement at any cost.

Contemporary political forces such as Islam (which has a long, varied, and complex history) need to be carefully assessed in their proper historical contexts. And contemporary labels such as "failed state," "quasi-state," and "rogue state"—terms that contain both tremendous symbolic power and implicit charges of incompetence and corruption—need to be reconsidered and avoided when possible. Thickly-detailed accounts of unfamiliar regions that are based on human intelligence and first-hand experience will rarely support simplistic claims about causality or

threat. Such accounts will tend to make policy formulation a more challenging undertaking, but they may also lead to policies that work for all sides.

Appreciate the problems inherent in tackling a single issue. A holistic approach is increasingly the only approach that seems likely to provide adequate leverage on some of the more daunting issues of developing countries. For example, population growth, environmental degradation, land tenure, and poverty are clearly interrelated in the NWFP and constitute a multi-faceted policy challenge. While small-scale initiatives focused on one facet or another may yield some positive results, substantial progress will require that all aspects of the challenge be addressed. The real and potential impacts of any policy should be assessed across all variables likely to be affected. This of course is what the World Bank (2000) and other multilateral development and lending institutions now are arguing, based on fifty years of project design and implementation experience in diverse settings.

For example, family planning programs may achieve very little when implemented under conditions of dire poverty such as those found now in the NWFP. Restrictions on what women are able to do means that there are powerful incentives to have as many sons as possible as a strategy for gaining social status and reducing economic risk. In turn, poverty alleviation programs are of limited success if they avoid the politically and culturally sensitive issue of clarifying and protecting property rights. But sorting out property rights in the region must be done with some sensitivity to ecological realities and the requirements of sustainability. The NWFP is not only natural-resource poor, but the forest cover it relies on for so many services is in grave danger. Unfortunately, coordination among various policy initiatives is not often evident among the governmental and non-governmental groups working in the province.

Resume some forms of development assistance to the region. The $3 billion poured into the region by the United States in the 1980s was a great boon to the local economy and may have been of critical importance to the defeat of the Soviet Union in Afghanistan. But these funds did little to promote long-term development. Indeed, the purchase of vast quantities of arms may have made the province's long-term development more difficult than it would otherwise have been, as the weapons have remained in the province and are freely and cheaply available.

Today, U.S. aid has been cut off to punish Pakistan for its nuclear weapons testing program. Residents of the NWFP fail to understand why their country has fallen completely out of favor with the United States in light of their valiant, decade-long involvement in the Soviet-Afghanistan War—which they feel made a small but real and costly contribution to winning the Cold War. They also feel that India's prior development and testing of nuclear weapons created a threat to which Pakistan had to respond (see WWICS, 1999).

The province greatly needs a larger social and industrial infrastructure and more resources to manage environmental change and strengthen the economy. Aid targeted at addressing some of the region's most pressing problems—especially water and air quality in Peshawar, sustainable forestry in the north, and basic education and infrastructure throughout the region—could have immediate, positive results that would also lay the groundwork for economic development and regional stability in the years ahead.

For Internal Parties

Fight corruption and inefficiency in the political system by strengthening federal and local institutions while reducing the mandates of provincial institutions that have failed. One way of describing the political problems in the NWFP is to say that strong local institutions have been diluted and displaced by weak provincial and federal institutions. The question of how to distribute resources and authority within a state has challenged many countries. Even in the most successful cases (such as the United States and Canada), the distributions are constantly renegotiated as needs change. Pakistan has very little that unifies its four provinces symbolically, structurally, or institutionally. Given the magnitude of its current problems, it may not have the luxury of working its way towards strong federal and provincial institutions through decades of trial and error. At this point in the country's history, at least some foundational institutions—such as courts—must gain legitimacy in the eyes of all sectors of the society. Indeed, a fair system of laws interpreted and enforced by reliable police forces and courts could be of great value in promoting a healthy, united future. Clarifying and improving civil-military relations, improving tax collection, and providing basic public goods and services such as clean water, education, and health care are also obvious areas where great gains could be made

that would pull together the provinces and add substance to the existing sense of shared fate and purpose.

Focus on the restoration and sustainable use of basic environmental goods and services. The NWFP is one of those places where improvements in social system performance may be contingent on implementing aggressive environmental programs. The province's economy is largely natural-resource based, and its water and forests are vital resources that are under particular attack. By protecting these resources and weaving them into sustainable economic practices, NWFP authorities would also be increasing the potential for developing new economic sectors (such as eco-tourism, fruit trees, and onion cultivation) that can draw in foreign exchange. If they allow these resources to collapse, however, it may deprive the province both of its foundation and its future.

Foster sustainable livelihoods by searching for a solution to the highly—divisive issue of contested and unclear property rights. Throughout the world, unfair or insecure land tenure is a challenge to sustainable livelihoods, conservation management, and environmental stewardship. The situation in the NWFP appears to be especially dire—there may be neither enough land to support the population nor enough funds to compensate for scarcities through strategic imports. Steps must be taken on both fronts if sustainable livelihoods are to become a reality for the province. But virtually every potentially positive step forward—from family planning to the cultivation of fruit trees—requires a clarification of property rights to create better stakes in the system and higher levels of security for the populace.

Promote regional stability. Tensions among Pakistan, India, and Afghanistan are serious and show few signs of decreasing in the near future. One out of every five people on the planet lives in these three countries. They border a Russia that has capsized and is sinking fast, and a China that seems poised between ascending to superpower status and fragmenting into several parts (see Goldstone, 1999). The entire region may be a dry forest that a misplaced match could set ablaze. Kashmir and Afghanistan are possible ignition points. And even if a region-wide catastrophe does not develop,

The road to the NWFP is highly vulnerable due to erosion and deforestation. (Photo by Richard Matthew).

simmering tensions make it difficult to move many important policy sectors forward, especially those that would benefit from transnational cooperation. In either case, the promotion of regional stability would be wise. Pakistan has ties to both Afghanistan and India that could allow it to play a vital regional role as peace-builder.[20] The United States or another objective and powerful third-party should facilitate a framework for such a dialogue. **W**

ENDNOTES

[1] See Homer-Dixon & Blitt (1998); Homer-Dixon (1999); Deudney & Matthew (1999); Lowi & Shaw (1999); and Diehl & Gleditsch (2001). For an interesting alternative view developed in South Asia, see Nauman (1996).

[2] For discussion of environment and security in the region, see Myers (1993), pages 101-121.

[3] For similar cases, see Homer-Dixon & Blitt (1998).

[4] These plans are presented in great detail in the *Sarhad Conservation Strategy* prepared during the 1990s by a variety of Pakistani organizations in association with the International Union for the Conservation of Nature. See IUCN (1997).

[5] For further detail, see IUCN (1998) and van Dijk & Hussein (1994).

[6] Members of the current Taliban government in Afghanistan are Pashtun.

[7] For a valuable account of this period written by a Pakistani intellectual, see Mirza (1999).

[8] In some parts of the province, overgrazing is also a problem. This practice may be especially acute in some of the marginal areas in which refugee camps were established.

[9] According to van Dijk and Hussein, the province's forest cover is about equally distributed between the Hazara and Malakand Divisions of the NWFP, and in Hazara, it is declining at the rate of between 1.4 and 8 percent annually. This rate would mean that the forest cover could disappear within ten to fifty years (1994, page 35). Van Dijk and Hussein identify the breakdown of customary ownership systems as among the major causes of the rapid rate of deforestation. Throughout the 1990s, the government implemented a ban on logging in an effort to reduce the amount of flooding in the region. Field observation suggests that the ban had a minor impact on deforestation rates. An aggressive reforestation program has added forest cover, but it is not clear that this will survive and flourish. See Hanson, Matthew, & Aziz (2000).

[10] For an excellent discussion, see Weaver (2000).

[11] For a useful account of the Taliban, see Marsden (1998).

[12] According to a report prepared by the IUCN, fuel wood consumption in northern Pakistan is ten times higher than elsewhere in the country. In the forty years from 1952 to 1992, forest cover in Hazara Division declined by 52 percent. Unfortunately, this is an area in which trees grow slowly but burn quickly (IUCN, 1998, page 11).

[13] Author's calculations, based on various sources.

[14] For information on field work, see Hanson, Matthew, & Aziz (2000).

[15] Information drawn from van Dijk & Hussein (1994); IUCN (1998); and Hanson, Matthew, & Aziz (2000).

[16] Articles in the major newspaper, *The Frontier Post*, often link refugees to crime even in the absence of evidence.

[17] About 60,000 people have been killed in Kashmir and Jammu since 1989.

[18] Data from Hanson, Matthew & Aziz, (2000).

[20] For a thoughtful analysis of the complex links between Pakistan and India, see Mirza (1999).

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ICG Report: "HIV/AIDS as a Security Issue"

At current rates, more than 100 million people worldwide will have been infected with HIV by 2005. In sub-Saharan Africa, experts believe that AIDS will eventually kill one in four adults. Infection rates in other regions are also rising at steep rates. At the pandemic level, HIV/AIDS can destroy not only individuals, families, and communities, but also economic and political institutions as well as military and police forces. For a growing number of states, AIDS is not just a public health crisis, but also a multilevel threat to security.

The International Crisis Group (ICG), a private, multinational organization committed to strengthening the capacity of the international community to anticipate, understand, and act to prevent and contain conflict, has published a report entitled "HIV/AIDS as a Security Issue." The report details AIDS as an issue of personal, economic, communal, national, and international security; it then outlines recommended responses by the international donor community, the United Nations, affected countries, and the private sector.

"HIV/AIDS as a Security Issue" is available on-line at www.crisisweb.org/projects/showreport.cfm?reportid=321. To learn more about ICG, visit its Web site at www.crisisweb.org.

Dilemmas for Conservation in the Brazilian Amazon

By Margaret E. Keck

Abstract

More than a decade after images of flames devouring the rainforest focused international attention on the Brazilian Amazon, the fires continue to burn. This article traces the history of conservation efforts in the Brazilian Amazon and then argues that repeated failure to understand or accommodate the political factors at work in the Amazon undermines environmentalists' efforts to protect the rainforest.

With the possible exception of certain endangered species and NASA images of the growing holes in the ozone layer, there is no issue on the global environmental agenda as "photogenic" as tropical deforestation. Images of forests in flames or of heavy curtains of smoke enveloping huge swaths of the western Amazon and of Southeast Asia have, for better or worse, etched "tropical deforestation" onto the public consciousness. It has especially come to be identified with the destiny of Amazônia, and of the lion's share of the Amazon rainforest that is located in Brazil. This is no accident. From the end of the 1960s to the present, an area bigger than France has been destroyed or seriously damaged (Veja, 1997).

Tracking the ebbs and flows of Amazônia as an issue provides us with a fascinating case study in environmental politics, both domestic and international. Over the last century, Amazônia has occupied a special place in the imagination—at once "green hell" and "enchanted forest," containing in equal measure the promise of untold wealth and of ecological catastrophe. All of these portrayals have been invoked at one time or another by those attempting to influence the direction of Brazilian government policy and practice in the region.

This article argues that, despite having made tremendous headway in public opinion (in Brazil as well as abroad), environmentalists have still not found a way to make conservation of the Amazon forest politically palatable in Brazil. Moreover, Brazilian policymakers' growing stress on making environmental "goods" pay their own way— encouraged in that position by domestic and multilateral economic actors—makes it unlikely that this situation will change any time soon. As a result, whenever Amazonian conservation measures require legislative approval or serious political support in Brazil, they founder. These political impediments reinforce a tendency among conservationists to bypass political organs, thus fueling the latter's suspicions of conservationists' motivations and contributing to a vicious circle of distrust that results in further degradation.

There have been very constructive efforts in recent years to identify sustainable Brazilian local land uses and to involve local people in conservation activities. Following the murder of rubber-tapper leader Francisco "Chico" Mendes in December 1988, the federal government established several extractive reserves to facilitate nonpredatory use of the forest for harvesting of rubber, Brazil nuts, and other activities. Interest in "sustainable" forest products, spurred by private firms like Ben and Jerry's and The Body Shop, led both local and international NGOs to pay more attention to inventing low-technology processes that would make more of this possible. A Rondônia-based NGO, for example, pioneered a process that mechanized separation of cupuaçu pulp from other parts of the fruit; it was eventually bought out by a large Brazilian frozen food company. One now finds in supermarkets in the south of Brazil fruits and juices like Açai and Cupuaçu, formerly only found in Amazônia itself.

But these advances are only small-scale improvements and should not be taken as a sign that

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conservation has won substantial political support among decision-makers. Without the latter, conservation will continue in planning mode and among scattered projects instead of becoming state policy. Although foreign money can help promote a conservation agenda, without domestic support it will always be fighting a rear-guard action—fighting fires that (often quite literally) have already gone out of control. Politicians matter in Brazil, both in national legislatures and at state and municipal levels. Until their opposition can be neutralized, most of Brazil's conservation activities remain cosmetic. The good news, however, is that at least for now, those in charge of Amazon policy at the federal level (a) are aware of the necessity to address opposition concerns and (b) are actively engaging state governors and other key political elites in ongoing dialogues about these issues.

Requirements for Progress

What would it take to generate real Brazilian political support for tropical forest conservation? First, conservationists must recognize the full range of land use alternatives that private investors, small farmers, fishers, recreation developers, mining companies, plantation developers, politicians, and national security specialists see when they look at the region. These actors do not, in the main, see forests and biodiversity. They see an environment that is crisscrossed with human activity and history, with a great variety of private ventures involving individuals, firms, and traditional populations. Interfering with these private activities requires justification on the basis of a compelling public interest. Indeed, this process of negotiating interests is the essence of environmental politics.

Environmental politics involves changes in the legal and cultural norms regulating the relationship between human beings and the natural world. We define "environmental"—literally, pertaining to what is around us—as context, with ourselves as the center. This is distinct from the term "ecological," which derives from the word *oikos* (or home) and denotes an idea in which humans are part of the context. These are public norms, whether or not they regulate public or private behavior. To define something as environmental is to impute to it a public relevance, a public interest. When someone complains that the pile of trash by the stream head is compromising the quality of the stream, those who left the pile can no longer insist that, since it is on their property, they have every right to put their trash there. The disposal of their trash has ceased to be a private issue and has become a public one.

Politicizing an environmental problem—making it into an issue—takes place in three stages: framing, action, and consolidation. Framing begins with naming, the act of placing a "situation" in a category that readies it for action. In the case of the trash heap, naming the problem involved the move from lamenting the dirty water to calling it a polluted stream. In the case of the Amazon, it involved a similar move—from recognizing a diffuse process of frontier settlement (in which the focus was on the human side of the frontier) to calling it "tropical deforestation," in which the focus was on the forest itself. This shift only began to happen during the 1970s. Framing also invokes a causal story whose function is both (a) to demonstrate that a problem is not an inevitable result of a "natural" process and (b) to identify the persons or organizations responsible (whether for the problem itself or for its solution) (Stone, 1989). In the case of Amazônia, shifting the blame for forest loss from small farmer settlers to the government policies that enticed them to the region in the first place changed the political locus of action. There is often considerable resistance to particular ways of framing an environmental issue; the ongoing debate over human contributions to global climate change is a perfect example of this resistance. Finally, those who frame an issue may do so strategically, stressing one set of causes or potential solutions over another in order to raise the issue in the institutional setting most likely to be receptive to their claims.

New issues anywhere tend to get on the political agenda in waves—what public policy scholars call a punctuated equilibrium (Baumgartner and Jones, 1993). This means that, at particular moments, a long period of relative stasis can give way to a sudden burst

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of activity in which new issues and actors suddenly win attention and succeed in getting action on a problem which may either be new or have been languishing in relative neglect for a long time. There are any number of reasons for such moments, ranging from a natural disaster to the passage of a new law to a regime transition. These stimuli produce political opportunities; but unless these opportunities are seized by strategically-minded actors, they are normally missed. Even at moments replete with opportunity to dramatize an issue, the political skills needed to do so have to contend with the political skills of opponents. In the recent history of Amazônia, the political skills have too often been in the hands of the forces of devastation.

HISTORY OF ENVIRONMENTALISM IN AMAZÔNIA

Amazônia has a long history of cycles—not only of boom and bust, but also of periods of geopolitical significance alternating with periods of relative neglect. The region was first linked to the rest of the country by telegraph, and many of its territories were demarcated at the beginning of the 20th century by the expedition led by Marechal Cândido Mariano da Silva Rondon in 1907. Rondon's mission coincided with the end of the rubber boom, caused by the successful British effort to produce latex on its Asian colony plantations. Nonetheless, the mission made possible the mobilization of Brazilian rubber tappers to reactivate the production of natural latex during World War II, when the rubber plantations of Southeast Asia were under the control of the Axis powers. Rondon himself was quite sympathetic to the fate of indigenous peoples in the region, and much of the protective legislation regarding Indians was enacted as a result of his encounters. But like their counterparts elsewhere, Indians in the Amazon came out of the

Deforestation in the Amazon, 2001

forest
non-forest
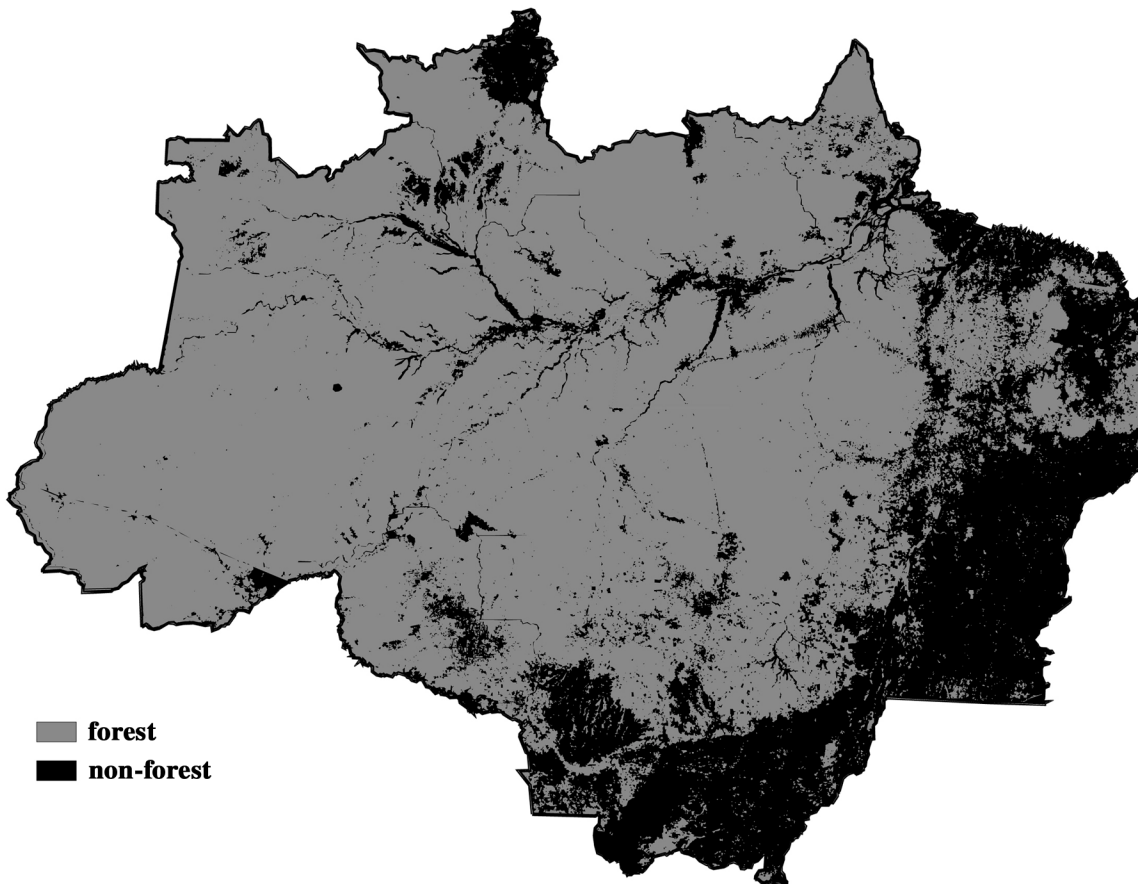
Source: Oregon State University (2001, January 18)

encounter with new epidemic diseases as well as the prospect of intensified settlement of their ancestral lands.

In the late 1960s, the Brazilian military dictatorship incorporated the Amazon explicitly into a national security agenda, with a focus more geopolitical than explicitly domestic. The importance to the regime of settlement and development of the region derived from (a) a belief that subversion could out "the need for careful consideration of the environmental problems involved in Amazonian development" ("The Opening Up of Brazil," 1972). UNESCO picked up IUCN's concern and made conservation of the Amazon rainforest the first project of its Program on Man and the Biosphere in 1971. But the Brazilian military government viewed the conservationist position as unwarranted interference in both its domestic and national security affairs. For

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take root in neglected and scarcely populated areas, and (b) a desire to demonstrate Brazil's greatness through the enormous wealth of natural resources held by the region. The view of the Amazon as repository of wealth, and of Brazil's destiny as coupled with development of that wealth, persists today. Thus, foreign efforts to influence Brazil's actions in the region have long been seen as the result of the *cobiça internacional*—international covetousness—regarding the region's resources (Reis, 1982).[1] The most recent wave of political attention to the region came in the late 1980s, stimulated from abroad as tropical deforestation became part of the agenda of "global" ecological problems.

Inventing "Tropical Deforestation"

In fact, the term "tropical deforestation" made it onto the international agenda in the first place because of the Brazilian Amazon. As late as 1968, the Latin American Conference on Conservation of Renewable Natural Resources had no session on forests, and in the index for volume 2 of the *IUCN Bulletin*, covering the period from 1967-1971, there is no entry for forests, deforestation, or tropical forest. The problem had not yet been named.

However, conservationists both inside and outside of Brazil worried about the development programs that the military government launched in the 1960s. Responding to the Brazilian government's decision to accelerate colonization and development plans in the region, IUCN—The Word Conservation Union—President Harold J. Coolidge and World Wildlife Fund (WWF) President Prince Bernhard of the Netherlands wrote to Brazil's President Médici in 1972, pointing most Brazilian officials, conservationists were just stalking horses for foreign governments seeking to prevent Brazil from achieving the place in the sun that its rapid development seemed to promise (Castro, 1972).

By the early 1970s, a massive program of road building was luring wave upon wave of settlers to the region—in search of opportunity, a plot of land to call their own, or perhaps a chance to strike it rich with tin or (later) gold. As the chain saws felled larger swaths of forest, organizations like IUCN and WWF encouraged Brazil's Environment Secretary Paulo Nogueira Neto to create conservation areas where possible. However, with almost no budget or human resources to monitor these areas, Nogueira Neto was in no position to defend them. Meanwhile, by assuming a strongly nationalist position at the United Nations Conference on the Human Environment at Stockholm in 1972, the Brazilian government put the international community on notice that it regarded environmentalists' calls for preserving the Amazon rainforest as attacks on Brazil's sovereignty.

Despite this initial flurry of high-profile diplomatic posturing, subsequent years saw an increase in not only settlements (and the failure of many of the early ones) as well as deforestation, but also in the number of (formally) protected areas in the Amazon. Scientists advocated protected areas because they believed that more knowledge, better education, and the gradual empowerment of the institutions charged with conservation offered the only real vehicles for change. Over the next decade or so, researchers at INPA (The National Institute for Amazon Research), the Museu Goeldi, and Brazilian and foreign

universities vastly increased the store of basic scientific knowledge about the region's ecology, while historians, anthropologists, geographers, and the occasional political scientist studied its peoples.

What of Brazilian *environmentalists* during this period? Although a Brazilian Environmental Secretariat was established after the United Nations Conference on Human Environment in Stockholm in 1972, and Nogueira Neto (a longtime conservation activist in São Paulo and well-known in international conservation circles) was named its head, this secretariat had no authority to challenge what other agencies in the government were doing and almost no resources to do anything on its own (Interview, Nogueira Neto, 1991). Despite these limits, Nogueira Neto managed both to raise the profile of environmental issues in the press and to establish a few protected areas. But challenging the government on the Amazon, the country's undeveloped "heartland" in geopolitical terms, would have cost him his job.

However, after the Geisel government began to relax the regime's strictures against opposition political activity in the mid-1970s, the opposition did take up the issue of Amazon preservation. In 1978 and 1979, it mobilized over the consignment of huge swaths of forest to investors for timber exploitation. At the end of 1978, the youth section of the opposition MDB party[2] in Amazonas called for general protests of the government's Amazônia policy. Out of this opposition grew the Movement in Defense of the Amazon, organized in 18 states and the federal district. The movement's appeal went well beyond environmentalists. In campaigning against the internationalization of the Amazon, the opposition appropriated for itself the nationalist appeal that the military had tried to wield with its developmentalist project in the early 1970s. The movement also protested (a) the lack of transparency and participation in decisions about the Amazon and (b) the lack of concern for the fate of impoverished inhabitants of the region. The movement's impact on policy was not very great, but it did nurture activists who later became regional leaders of the environmental movement (especially in the north and northeast of Brazil). The government response was primarily to make sure that forest policy discussions took place behind securely closed doors (Hochstetler, 1996).

Normally, however, the Brazilian military regime reserved for itself the mantle of defender of the nation. This perspective was especially evident in relation to indigenous rights claims. Around the end of the decade, scholars and activists trying to secure the rights of indigenous peoples also became important actors in the Amazon story. Their actions were invariably interpreted as threats to Brazilian sovereignty over its territory. Even their language (speaking of indigenous "nations") raised the hackles of national security officials. The presence of guerilla activity in the Alto Araguaia region until 1973 made the Brazilian military particularly sensitive to this issue.

The struggle over the nationalist mantle between the Brazilian government and the Movement in Defense of the Amazon during the late 1970s was essentially a domestic struggle that did not spill over into international institutions. Indeed, aside from UN agencies like the United Nations Environmental Programme (UNEP) (which could do little more than issue advice and admonitions), there were no international venues appropriate for acting on concern over deforestation in the Amazon. This situation changed in the 1980s, largely due to the political entrepreneurship of environmental activists and the commitment of a small number of people within multilateral development institutions (especially the World Bank). The next wave of attention to the Amazon was much more strident than the preceding one, and found the Brazilian government in a much less favorable position to respond.

"The Burning Season" [3]

Foreign interest in the Amazon swelled again in the late 1980s with the rise of "global" environmental issues such as depletion of the ozone layer and (especially) climate change. Through a set of serendipitous associations, tropical deforestation became associated with global climate change.[4] The coincidental element was provided by the weather during the U.S. summer of 1988. A month of sweltering heat and prolonged drought, coming on the heels of scientific warnings about probable human impacts on climate, seemed to confirm the worst predictions of the latter. At the same time, satellite images became available showing the extent of fires in the Brazilian Amazon that had been set to clear land either for farming or for speculation. The huge number of Amazonian fires made for great photos, stimulating even more press coverage.

For foreign audiences, a process spearheaded by Brazilian land speculators trying to defend their extensive properties became (in simplified media translation): "Brazil is burning down the rainforest."

Map 2. Amazonian States

International pressure to control the situation produced a nationalist response as it had a decade earlier—but this time Brazil was in a much less favorable position to resist. Events and rhetoric about Brazil during the 1972 Stockholm conference were far different: the Transamazon Highway had just opened, glossy magazines had proclaimed a new life on the frontier, and critics of Brazil's Amazon policy had been cast as spoilers who wanted to impede Brazil's glorious progress. But by 1988, the Transamazon Highway was overgrown, crater-filled (barely passable by motorbike at some points), and lined with deserted settlements, victims of too many hopes with too little infrastructure and extension support. The new life on the Amazonian frontier had made a few people rich, but it had broken as many dreams as it had fulfilled. Consequently, at least some of the skepticism about what was going on in the region was homegrown.

The years 1987 and 1988 were record years for Brazilian deforestation—not because of a sudden peak in new settlements or new ranching operations in the region, but for political reasons. In the Brazilian Constitutional Congress underway at the time, there was a real possibility that agrarian reform measures would be adopted. The prospect led to the creation of a rapidly organized counterattack by rural landowners under the leadership of the UDR (the Rural Democratic Union), which eventually succeeded in gutting the redistributive planks of the new charter. However, ranchers and others with large landholdings in Amazônia did not want to take any risks. Since any land-reform measure was likely to focus on so-called "unproductive" land, they looked for ways to make their expanses appear productive. At that time, one of the ways to demonstrate that land was productive was to clear it; such clearing counted as an

improvement, which added value to the property. And in case clearing was not enough, it was always possible to add a few cows. As a result, around 300,000 square kilometers of forest were destroyed in the last years of the 1980s (Hecht 1992, page 21).

Giving the Rainforest a Human Face

In the late 1980s, Brazilian environmentalists gained a whole new set of arguments tying conservation of the Amazon forest with protection of human extractive activities. Brazil nut gatherers, rubber tappers, and fishers were highlighted as examples of groups that lived in and off the forest without destroying it. But the livelihoods of these groups, small though they might be, were being threatened by the advancing settlement frontier. Accounts of their endangered situations created a

reserve—a form of protected area that allowed for collection and sale of renewable forest products (natural latex, Brazil nuts, and some others) under the protection of the national environmental agencies. Paulo Nogueira Neto was receptive to the idea, and it won support both from environmentalists in southern Brazil and from those in the United States and Western Europe who were campaigning to make the multilateral development banks (especially the World Bank) more environmentally responsible (Keck, 1995; Keck & Sikkink, 1998; and Keck, 1998).

When Chico Mendes was murdered in the midst of sustained international attention to deforestation in the Amazon region, the issue attained unprecedented salience. Brazilian President José Sarney created the first extractive reserves and took steps to curb some of the worst abuses in the region (though

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Worried that piecemeal solutions could not address the problem, the World Wildlife Fund (WWF) introduced in the mid-1990s an audacious campaign to try to get the Brazilian government to commit formally to conserving 10 percent of the Amazon forest.

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powerful narrative contesting the government's claim that fighting poverty required the large-scale development (and hence deforestation) of the Amazon (Keck, 1995). When rubber tappers' organizations from the western Amazon made common cause with environmentalists, it also undermined the popular tendency in Brazil to dismiss environmentalism as a hobby for the well-heeled and well-fed. In addition, the assassination of Francisco "Chico" Mendes in December 1988 by local ranchers created an ecological martyr and gave the problem of deforestation in the Amazon a human face.

The rubber tappers were well aware that, unless they built some powerful alliances, it would be only a matter of time before the advancing ranching frontier pushed them out of the way. With the help of the National Rural Trade Union Confederation (CONTAG), the tappers had won court cases that recognized their legitimate use rights to the land they worked. But the law was only a minor impediment to ranching expansion and land depredation in that region. The rubber tappers worked with Mary Allegretti (an anthropologist from the southern state of Paraná who later became Brazilian secretary of the environment for Amazônia) and Oxfam representative Tony Gross to develop the concept of an *extractive*

these measures were weakly enforced). The humanization of the deforestation issue was especially constructive in augmenting the participatory component of conservation programs then on the drawing board. For example, it had an enormous impact on the Amazon Pilot Program (funded largely by the G-7 and administered by the World Bank), which is providing both small- and large-scale funding to a range of conservation projects in the region. The program also financed capacity building and institutional infrastructure for NGOs to make it easier for them to monitor activities in the region. Although the pilot program's results are small in scale, the program has funded a significant number of demonstration projects, transformed the methodology of demarcating indigenous reserves, and had some degree of impact on public policies.

Making the Forest Pay

Since the source of the spike in Amazonian fire incidence in 1987 was not widely understood, its use thereafter as a baseline for measuring subsequent deforestation in the Amazon was misleading. It caused observers to overestimate the impact of policies intended to discourage it. On paper, at least, the Brazilian government undertook several important

policy reforms to reduce deforestation. In the package of policies known as "Nossa Natureza" (Our Nature), President Sarney announced the consolidation of existing forest and fisheries administrations into a single environmental institute called the Brazilian Institute for the Environment and Renewable Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis—IBAMA). IBAMA was charged with monitoring and licensing the cutting of forested areas. However, IBAMA was seriously understaffed in the field, and plans for increased monitoring proved hard to carry out when under-qualified field personnel lacked even funds to buy gas for the cars and boats they were expected to use. Thus, despite both policy change and sophisticated satellite monitoring capabilities developed at the Brazilian Institute for Space Research (INPE), the drop in deforestation rates after 1987 and into the 1990s were mainly because of recession, not state action. After the recession ended, high rates of deforestation returned—and 1997 looked much more like 1987 than the decade in between. When a wave of land occupations led by Movimento dos Sem Terra (the Landless Movement) at the end of the 1990s put agrarian reform back onto the political agenda, the rate of burning again skyrocketed almost immediately.

The use of the 1987 baseline was only one of the elements that allowed the Brazilian government to buy time through the early 1990s. Another was the successful bid by Brazil to host the 1992 United Nations Conference on Environment and Development (also know as the Earth Summit) in Rio de Janeiro. President Fernando Collor, the first directly-elected Brazilian president in close to thirty years, swiftly moved after his inauguration in 1990 to pacify both foreign and domestic environmentalists. He elevated the environmental secretariat to ministerial status and appointed José Lutzenberger, a key figure in Brazil's environmental movement and one with broad international recognition, as its minister.

Both foreign and Brazilian environmentalists applauded the move, and adopted a wait-and-see attitude. Even when it became increasingly clear that Lutzenberger (however important an environmentalist he might be) was not an effective minister, most of his potential critics remained silent. With the widespread mobilization of a broad range of organizations in preparation for the Earth Summit and the publicity it generated, there was still reason to believe the salience of environmental issues in general and of the Amazon in particular was bound to increase within Brazilian policymaking.

But Lutzenberger's inability to build on the momentum of the Rio occasion (coupled with corruption scandals involving Collor that exploded the minute the Earth Summit ended) wiped the environment off the Brazilian political map. For the next six months, the country's attention was glued to Collor's impeachment process; and by the time he had left office, the opportunity had dissipated. This is not to imply that there has been no environmental progress since Rio. In fact, over the last two decades, environmental issues have entered Brazilian popular culture and attained special importance among Brazil's young. There is more information and more general public sentiment in favor of conserving natural resources than ever before. However, this support is still not reflected at level of politics. The great opportunity of the early 1990s was largely wasted.

The efforts to make extractive activities appear economically viable (and thus able to "support" the forest, represented in the 1990s by biodiversity conservation arguments and bio-prospecting) were also unsuccessful. Although there were some high-profile economic activities generated during this period involving sustainably-generated rainforest products, these products remained highly subsidized by their corporate marketers. Bolstered by international pressure to eliminate both tariffs and non-tariff barriers, the Brazilian government had in the main embraced neo-liberal policy prescriptions. The proponents of neo-liberal reforms were anti-regulatory and highly optimistic about market solutions.

In this new policy environment, opponents of deforestation tried to bolster their position by arguing that a properly-conserved Amazon forest could pay for itself. Since the Amazon's environmental services are public goods (and thus hard to quantify in market terms), environmentalists began stressing the lucrative potential of its private goods—forest products and future pharmaceuticals. But although these arguments are easier to communicate, they are ultimately less compelling than the scientific and ethical issues at the core of tropical forest conservation and protection of indigenous peoples. It has been extraordinarily difficult to make a convincing case based on opportunity cost that deforestation does not pay—a case made even harder by a tendency towards heavy discounts on the future.

However much proponents of preservation and proponents of limited use may have made common cause during the 1990s, there is still a wide divide

Amazonian Deforestation Projections for 2020

Optimistic
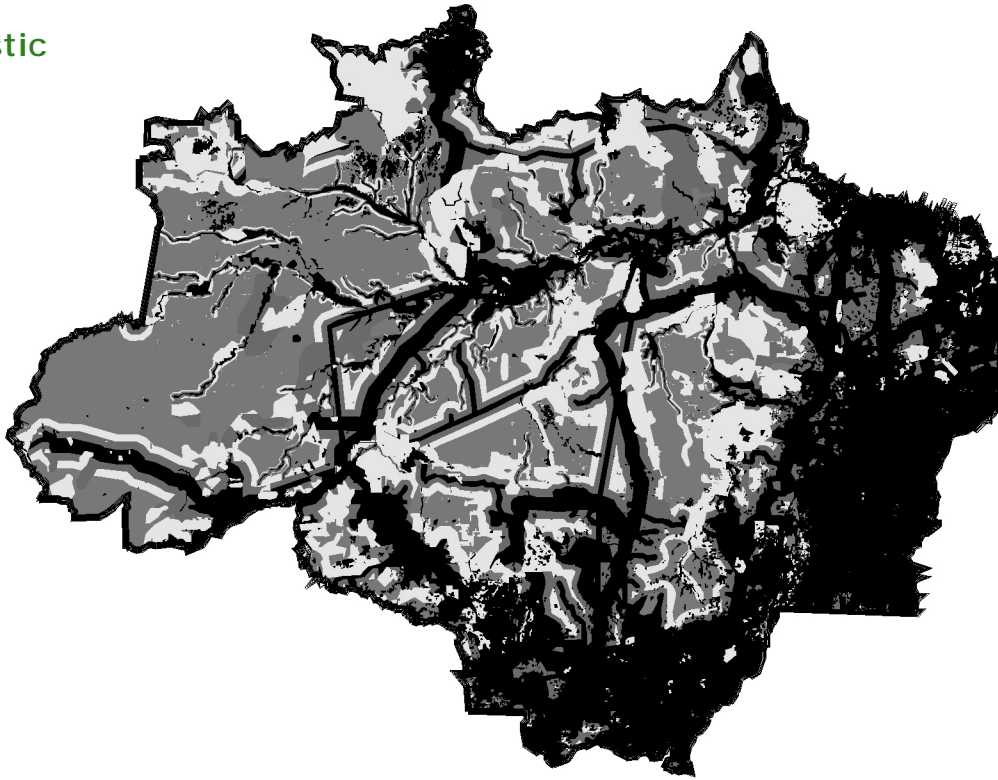
Non-Optimistic
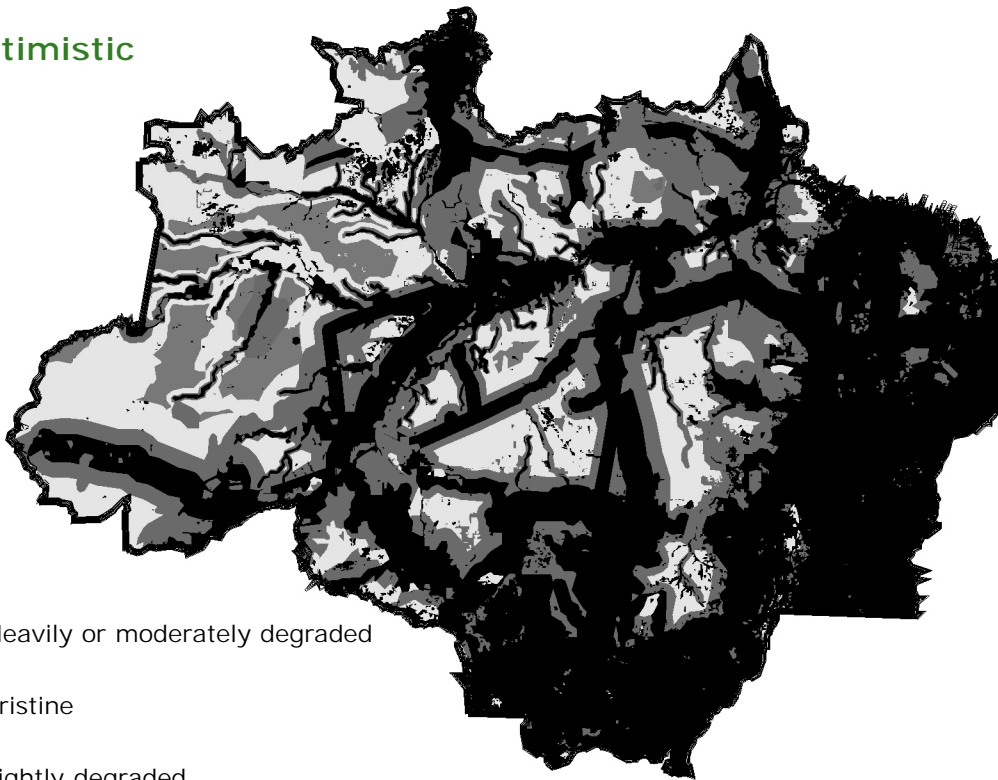
■ Heavily or moderately degraded

■ Pristine

□ Lightly degraded

Source: Oregon State University (2001, January 18)

between them. This gap persists among Brazilians and among foreigners concerned with the Amazon. Generally speaking, the first set is more often associated with the more traditional conservation organizations in Brazil and the larger conservation NGOs internationally. At the beginning of the 1990s, it looked as though these two positions were going to come together more than they eventually did. International conservation organizations began to pay much more attention to people-based environmental management, especially community-based resource management initiatives. A growing literature on common-pool resource management suggested that a great many communities had over time developed remarkably effective institutions to manage such resources, and that not all had degenerated into a "tragedy of the commons"(Hardin, 1968; Ostrom, 1990).

However, human-centered projects and programs tend almost by definition both to be very small scale and to have a significant failure rate. Concerned that these locally-focused activities were creating only an unsustainable patchwork of conservation, many conservationists wanted to focus their efforts on larger areas. The sharp rise in deforestation rates that came with resumed growth in the region also fueled a fear that time was running out. A decade after Nossa Natureza, IBAMA still had only 400 people in the field to monitor forest use.

By the end of the 1990s, timber companies (not a major contributor to deforestation in the Amazon in 1987) had become major Amazonian loggers. In a study concluded in December 2000, IBAMA found that around 80 percent of the management plans of timber operations in Amazônia were irregular. In many cases, the amount of timber listed the documentation presented to the government as scheduled to be harvested was more than the number of actual trees in the area. Timber companies used the difference to "launder" the logs harvested in reserve areas that were supposed to be off-limits (Angelo, 2000). But until IBAMA's recent survey, no one had ever gone out to the field to verify the inventories listed on the documents.

With the Cardoso government (which took office in 1994) more concerned about restructuring Brazil's economy than it was about conserving forest, timber revenues were attractive. Timber exports brought in more than 1.1 billion reals (over U.S. $1.03 billion) in 1997. The push to increase Brazilian exports generated more pressure on a variety of ecosystems. For example,

new federal regulations (a) allowed more deforestation on savanna land (favoring soy producers), and (b) increased the number of situations in which deforestation limits could be waived. Alongside these legal activities, the drug trade—long a significant source of revenues in Amazônia—was becoming increasingly powerful.

Worried that piecemeal solutions could not address the problem, the World Wildlife Fund (WWF) introduced in the mid-1990s an audacious campaign to try to get the Brazilian government to commit formally to conserving 10 percent of the Amazon forest. In 1997, worried about the damage that reports of increased deforestation were doing to Brazil's public image, President Fernando Henrique Cardoso endorsed the 10-percent proposal. In November 1999, a team for the Ministry of the Environment, Secretariat of the Amazon, began to work with people from WWF-Brazil to identify areas for protection under this program.

The process was not smooth. Despite objections from some members of the team (and despite a prior agreement that the 10 percent could include some areas for "direct use," i.e., areas with some sustainable human activities such as extractive reserves and national forest), the WWF representatives and several others on the team insisted that only "indirect use" protection would be contemplated. However, when the team forwarded the first version of its proposal to both the Global Environmental Facility (tagged as a significant funder) as well as to Mary Allegretti, the Secretary of the Amazon, Allegretti commented that they had managed to create something that would alienate absolutely everyone who could be alienated—both extractive Amazonian peoples (who by this protocol would have to be removed from the territories in question) and development interests. What made the situation even more problematic was that, over the past several years, the Brazilian Environmental Ministry has been unable to get *any* protected area legislation passed in the country's Congress due to opposition from Amazonian politicians. Allegretti sent the team back to the drawing board with instructions to include some direct use areas as well.

Allegretti's determination to create a feasible program in fact represented an important advance in the politics of the Amazon. Recognizing that confrontation was not producing any positive effects, she began to sponsor "positive agenda" conversations about alternatives to deforestation with state government officials in the Amazonian states. Thus

far, she has drawn up positive agenda statements from the states of Acre, Rondônia, Amapá, and Roraima. Although these are fairly minimal agreements, their very existence is an important step.

Consistent Conservationist Mistakes Regarding the Amazon

If we examine efforts to protect the rainforest over the last two decades of Brazil's history, we can detect a number of persistent misconceptions that have complicated policymaking in and for the region. Some are misconceptions about current settlement patterns in the region. Others have to do with the expected behavior of important actors. Conservationists in general—and foreign conservationists in particular—have fallen prey to one or all of these at one time or another (as have many of the region's best analysts).

1. Essentialism

By essentialism, we mean the tendency to take either the position that people are naturally conservationist or that they are naturally destructive. Neither absolute seems warranted by the evidence; of more relevance is a careful examination of the kinds of incentives that exist for one or another behavior, incentives that will vary from place to place and from time to time. Into the essentialist category we also have to put those who believe that indigenous people always will desire to protect a particular area. Thus, when the Kayapó Indians sell timbering rights to lumber companies, these essentialists are horrified and may indeed go too far in then concluding that indigenous peoples are no more likely than others to conserve natural areas (Conklin and Graham, 1995). Cultures, identities, and institutions or structures of authority and practice may be relatively sticky, but they are not frozen; people respond to new opportunities, and the way they do so reshapes the older relationships.

2. Keep politicians out of the loop if you want to get anything done

Many conservationists believe that the best approach to dealing with politicians in Brazil is to present them with plans for a protected area as a *fait accompli*, so that they will not be able to do anything about it. These conservationists think that politicians will try either to reject or to modify proposals for political (usually self-serving) reasons, thus undermining the more "objective" scientific rationality contained in the proposal.

A good illustration of this phenomenon was the process by which the first approximation of an agro-ecological and economic zoning plan for the state of Rondônia was drawn up in the early 1990s. Put together by technically proficient and for the most part well-meaning state officials working with consultants, the plan generated widespread controversy in the state because the kinds of land-use mandated by the plan often did not correspond to the situation on the ground. This mismatch was partly because the team that drew up the plan worked mainly from satellite images and did very little traveling outside the state capital.

More important, however, was the *political* isolation within which the team worked. When asked whether they had consulted with local government officials in different parts of the state in drawing up the zoning plan, the planners responded that they had not, since the local government officials were certain to be against it. However, local government officials were going to be responsible for much of the plan's implementation. While in the short run this kind of insulated strategy may streamline the creation of "paper parks," it also creates a kind of virtual reality, in which all of the actors act as if they believed something were true while knowing that it is not. Over the long run it has politically disastrous results and is the best way of insuring that park boundaries will not be respected.

When push comes to shove, no one is willing to risk much political capital on a plan drawn up in virtual reality, "para inglês ver."[5] As long as Brazil is either unwilling or unable to put money behind enforcement and monitoring, consent and political support are the only resources to make a policy effective. However tough it is to work things out with opponents of conservation, preaching to the choir is a much greater waste of time than is preaching to the unconvinced.

3. Officials in technocratic state agencies are free agents whose technical training disposes them to support conservationist goals

Although in many cases the second half of this statement is true, the first half almost never is. State officials are not free agents. Brazilian technical officials (especially in Amazônia) who are at a decision-making level are politically appointed. Their posts are usually doled out among supporters of the governing coalition (who might be federal or state deputies, mayors, or other political bosses), ensuring that important

supporters may appoint part of their own political coterie to public jobs. In addition, the political appointment process usually reaches several levels down, and the sponsor of names for the second and third echelon appointees may not be the same as the one who appoints the department heads. As a result, different levels of the same bureaucratic agency may or may not share a common agenda or governing style. These officials are constrained by the political sponsors at whose behest they serve. They can be removed through the same political process that appointed them in the first place, either because they fall out of favor with their immediate sponsor or because the sponsor shifts allegiances or falls out of favor with the governor, mayor, or president who heads the coalition. The extent to which these officials can take unpopular positions and remain in office thus varies a great deal—but it is usually low.

4. Failure to pay attention to political context

"Environment" is not a policy arena that exists in a vacuum. Neither is Amazônia, its deforestation, or its development. Understanding what is going on with regard to the Amazon requires paying attention to two relevant dimensions: (a) activities and dynamics in areas that are politically linked to some aspect of forest conservation—that is, linked in *political space*; and (b) items and dynamics on the relevant political agenda (national, regional, international)—that is, linked in *political time*. What is important here is the perceptual linkage, not that the relationship in reality bears any resemblance to the perception.

The debate over agrarian reform in the Brazilian Constituent Assembly is a perfect example of the former. For landowners in the Amazon, the possibility of expropriation caused them to speed up deforestation on their properties to demonstrate that land was being prepared for productive use as pasture. Land reform and conflict over land tenure have been among the issues most consistently linked with deforestation in Brazil, just as climate change and indigenous peoples are the policy areas most consistently linked with Amazônia outside of Brazil—especially in the United States.

Brazilians, on the other hand, have always believed that foreigners think of Amazônia primarily in terms of its purportedly vast mineral wealth and potential hydroelectric power. Although it must have some, it is not clear how much of an impact multinational involvement in the region has on U.S. foreign policy positions on Amazônia. Nonetheless, Brazilian politicians and some diplomatic personnel continue to insist that the U.S. government is not really serious when it takes conservationist positions and that these positions are essentially a front for U.S. multinationals.

Besides being aware of how their motivations are perceived, conservationists working in the Amazon need to be more aware of how other policy areas affect the ones that most concern them. This need has become abundantly clear with regard to land and energy policy. Other policy areas—for example, the expansion of the highway network being undertaken as part of the federal government's "Avança 2000" infrastructure development program—have even greater potential for disruption. Where roads are built in previously undisturbed areas, ecological processes are disrupted and/or destroyed, and settlements inevitably follow. With its focus on privatizing infrastructure development wherever possible, current Brazilian government policy provides a degree of insulation for economic actors from the constraints of environmental regulation.

Political time is also an important factor: environmentalists have always had to seize what political opportunities become available to accomplish reforms. Institutional capacity has tended to develop in the wake of major events—such as the 1972 Stockholm conference or the intense international focus on global environmental issues in the second half of the 1980s. Most people expected another such flurry of capacity-building in the wake of the Earth Summit in 1992, and Brazilian environmental and social change organizations mobilized for two years prior to that conference to build for just such an eventuality.

5. Money is the main problem, and "capacity building" is the solution to weakness of environmental protection institutions

The usual version of this argument is that the money to establish, maintain, and monitor conservation units is simply not available. There is a good bit of truth in this statement. However, if money were the main obstacle, then a big push on fund-raising by conservation organizations (coupled with other instruments such as debt-for-nature swaps and foreign assistance by sympathetic governments) should resolve the problem. When it does not do so, the failure is often attributed to "lack of technical capacity" or "lack of institutional capacity" on the part of the agencies charged with establishing and/or running conservation units.

But capacity has to be measured relatively and absolutely. If an environmental agency is short on money or technical capacity, is it equally true that the transport or public works secretariats lack these things? In fact, governments make choices about where to allocate existing capacity, and the choices are political. Governments must be convinced that protection of the landscape ought to be a priority expenditure before they will make it one. It is therefore impossible to separate the question of adequate funding or capacity from the need for the political will to use money for conservation purposes. In the absence of the latter, no amount of money or skill will make much of a difference.

Abundance (especially sudden abundance) of money or technical expertise can cause as many problems as its lack. Both non-governmental and governmental organizations can quickly become intoxicated with easy money from outside. The fact that the budgetary cycles of both the funders and the funded (in the case of governments) produce boom and bust periods in which recipients go for long periods waiting for money to arrive (and then are constrained to spend their windfalls before a predetermined deadline) is particularly noxious in this respect.

Conclusion

It is easy to despair after reviewing the last thirty years of history of the Amazon region. Conservationists have found victories difficult to win and even harder to sustain. Politics and political context *always* play an important role in decisions about the region, and those who want to affect those decisions ignore that context at their peril.

Brazilian conservation success stories confirm this lesson. Consider, for example, the case of the Brazilian state of Acre, where those who wanted to keep the forest standing were part of—and helped to create—a substantial coalition that opposed predatory land uses at the same time as it opposed predatory politicians. That movement eventually succeeded in electing people who supported these goals to high office—mayor of the state capital, then governor and senator. Under those circumstances, the terms of the equation may begin to change.

But to sustain that change, there must be support from outside of Amazônia, and especially from Brasília. We are once again witnessing a shift in the political context and the agenda on which Amazônia appears. In Amapá, where a similarly well-intentioned governor attempted to face down a state legislature permeated with drug money, the legislators were able to create a prolonged stalemate with little more than verbal opposition from Brasília. Although the ubiquity of drug-related activities has been known in the region for at least a decade, only recently has it been admitted officially as a national security problem.

Over the last three years, the rate of deforestation in the Amazon has crept up again. Between August 1999 and August 2000, 19,000 square kilometers of forest were deforested—the second most destructive year of this decade after 1995 (Schwartz, 2001). That amounts to the size of a football field every eight seconds. The story is achingly familiar. Under pressure from soybean producers to provide a cheaper outlet to the sea, the Ministries of Planning and Transportation (without consulting the Ministry for the Environment) agreed to pave the unpaved part of Highway BR-163 between Brasília and Santarem in the state of Pará. The currently unpaved part of the highway cuts through the Tapajos forest reserve and other vulnerable sections of forest. At the same time, under pressure from the landless movement, the government has increased the number of new small farmer settlements in the region. These settlers, in turn, use fire to clear their land, and the frontier advances. Along with loggers, settlers are likely to move along the paved roads, until they are bought out by the ubiquitous cattle ranchers. The combination of paved roads, settlers, and extractors (of minerals or of timber) is one the region has seen many times before.

As each cycle of destruction runs its course, new instruments have been created to make sure that there would not be another like it. The environment ministry and its congressional allies have called the move to pave BR-163 illegal—as any such large undertaking must, by law, have an environmental impact assessment. Whether they are strong enough to prevail against far stronger pressure from the road's proponents remains to be seen. W

ENDNOTES

[1] Arthur César Ferreira Reis's famous book *Amazônia e a Cobiça Internacional* is still widely cited as a major authority on Amazônia in foreign relations, and similar themes are stressed in the majority of Brazilian writings on the region. See, for example, Procópio (1992).

[2] MDB (Movimento Democrático Brasileiro—Brazilian Democratic Movement) was the legally sanctioned "opposition" political party during the military dictatorship that ruled Brazil between 1964 and 1985-89. A mere paper opposition through most of its first decade, the party began to exercise a genuinely oppositional role beginning with the relaxation of restrictions on its electoral activity in 1974. By 1978, the "opening up" of the authoritarian regime was in full swing.

[3] This was the title of a 1992 book by U.S. journalist Andrew Revkin about settlement of the western Amazon and the life of Francisco "Chico" Mendes, leader of rubber tappers in the region of Xapuri, Acre, who successfully confronted cattle ranchers encroaching on the land they had traditionally used. Mendes was assassinated by a cattle rancher in December 1988.

[4] This is not to deny that such a connection exists, but merely to note that public perception of a direct link between the record heat of several U.S. summers in the 1980s and the fires of the Amazon was vastly overdrawn at the time.

[5] Literally, "for the English to see." This is an expression used in Brazil to mean something that is done to satisfy outsiders, but that is not really intended to work.

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Environment and Security in the Amazon Basin

The Latin American Program of the Woodrow Wilson Center has published *Environment and Security in the Amazon Basin,* a series of papers given at Wilson Center meetings sponsored by both the Latin American Program and ECSP. (Two of the papers—those of Margaret Keck and Tomaz Guedes da Costa—are featured in this issue of the *Report*.)

The first meeting covered: environmental and sustainable development initiatives in the Amazon Basin; the roles of local, national, and international actors in the region; the evolving Brazilian national security perspective; and the rising threat of drug trafficking. The second meeting focused on environmental policy in the Brazilian Amazon and featured Mary Helena Allegretti, Special Secretary for the Coordination of Amazonian Policy in the Brazilian Ministry of the Environment. The final meeting examined Brazil's SIVAM Project and its implications on the Amazon.

For a copy of *Environment and Security in the Amazon Basin,* please contact the Latin American program at lap@wwic.si.edu.

BRAZIL'S SIVAM: AS IT MONITORS THE AMAZON, WILL IT FULFILL ITS HUMAN SECURITY PROMISE?

By Thomaz Guedes da Costa

Abstract

As Brazil implements its System for Vigilance of the Amazon (SIVAM), the country's leadership continues to tout the system as a major effort towards achieving its national security objectives—especially (a) preserving the country's sovereignty over its territories in that tropical forest region; (b) assisting in Amazon law enforcement, particularly in deterring illegal flights associated with contraband and narco-trafficking; and (c) providing environmental information aimed at promoting sustainable development and the preservation of natural habitats in the Amazon. But while official arguments promise SIVAM will contribute to all three objectives, the lack of: (a) transparency in the program's development and implementation; and (b) greater participation by non-official organizations in how SIVAM will gather, process, and disseminate information threatens the environmental and human security value of the system.

For at least the past decade, significant political actors, opinion-makers, and the general public (both in Brazil and overseas) have paid unprecedented attention to the Amazon region. They are primarily concerned with: (a) environmental protection of the area (as it becomes the backdrop for accelerated social and economic development); (b) exploration of natural resources; and (c) criminal activities with transnational implications. Reacting to internal and external calls for more efficient governance of the region, the Brazilian government argues that the country's new System for Vigilance of the Amazon (SIVAM) will, when fully implemented, play a key role in supporting the coordination of Brazilian federal policies in the region. Specifically, SIVAM is expected: (a) to help ensure Brazil's sovereignty over its portion of the Amazon; and (b) to provide greater means to generate geophysical, biological, and social data about the region as well as to improve the quality of sustainable development decision-making there.

Since 1985, the Brazilian government has been repeatedly shaken by contraband and security problems in the region and on its borders with other Amazonian countries such as Colombia and Venezuela. As a result, Brazilian authorities have wished to expand the country's national air traffic control system (SINDACTA) into its Amazonian region. But a lack of investment funds and the dauntingly large area that would have to be covered by radar (equal to that of Western Europe) delayed such an expansion.

Finally, a series of factors spurred the political will to launch SIVAM. First, as Brazil's developmental policies in the Amazon became the object of increasing foreign criticism and as the carbon dioxide cycle was linked to global warming, Brazil's federal authorities proposed a System for the Protection of the Amazon (SIPAM) at the 1992 Rio Conference. SIPAM began with a drive to map the region precisely as the first step towards establishing the Amazon as a zone in which economics and ecology would be balanced. Simultaneously, Brazilian law-enforcement authorities demanded greater control of the region's air traffic because of the growth of illegal drug-trafficking and cross-border smuggling fights in the early 1990s. But the decisive factor in the acceleration of SIVAM's development was the United States' intensified push to curb drug production and smuggling from Colombia, Peru, and Bolivia by air detection and interception of suspect aircraft. As an immediate consequence of such operations conducted by the

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United States and other countries in the arch from Venezuela to Bolivia, Brazilian President Fernando Cardoso issued a directive in 1996 to impede access of non-authorized flights across Brazil's northwestern border and to articulate the defense of its portion of the Amazon in reaction to strategies observed in neighboring countries (Presidential Directive, 23 February 1996).

SIVAM: Components, Goals, and Development

SIVAM is a complex combination of: (a) fixed, mobile, and airborne radar; (b) ground sensors; (c) telecommunication networks; and (d) computerized data collection and information management structures.[1] Accusations by opposition parties and the press of fraud and legal mismanagement in the initial contract bid process for SIVAM caused delays and protracted political difficulties for the program. But the first contract was finally launched in March of 1997, and first operations are estimated to begin in late 2002. Raytheon is the prime contractor for the ground technical segment, which will include up to 13 air traffic control sites and six mobile radars. The aerial portion is supplied by Embraer, a Brazilian aircraft manufacturer. It includes: five Embraer ERJ-145SA planes equipped with Ericsson's Erieye phased-array radar; three ERJ-145RS planes for monitoring natural resources exploitation and environmental missions; eight to 12 weather radar stations; and a variety of water and ground sensors and stations as well as communication facilities and three regional information processing centers (at Belém, Manaus, and Porto Velho). Air patrol in the region will be conducted mainly by Tucanos ALXs procured from Embraer.

Authorities—particularly in the Brazilian defense sector—are promising to use SIVAM to provide Brazil with the overall means: (a) to monitor human movements and activities and their impact on the Amazon; (b) to increase knowledge about the region's environment, biodiversity, climate, and geophysical features; and (c) to protect the Amazon's environment while promoting local economic development there. The first sketchy conclusions about SIVAM's effectiveness will be drawn as parts of the system become operational, are tested, and acquire full capability.[2]

The SIVAM program was born in a politically powerful crib in the mid-1990s, as issues of economic development in the Amazon region clashed with environmental concerns. Despite the existence of SIPAM, there was no clear national strategy in Brazil to protect the Amazon. The general perception was that market forces would continue to sustain those large agricultural projects and migratory movements that were putting at risk the ecology of the region without providing even remedial assistance to local communities and their traditional development (Silva, 1999). While a large number of Brazilian congressional representatives from the Amazon states were optimistic about SIVAM and its possibilities to bring investments to their region, the program's early history saw many controversies and much ambiguity—harsh battles over contracts, accusations of kickbacks and inside information, and bureaucratic disputes that marred its technical conception and purposes. The results of a Brazilian Senate investigation of irregularities in the early stages of purchases by SIVAM's contractors did not dispel the cloud of "shady deals" hanging over the program (Zaverucha, 1995). Additionally, as construction of the program's radar stations and sensors has moved ahead, cost overrun and conflict of interests have come under investigation by Brazil's Union Accounting Court (Fortes & Krieger, 2000).

Tangled by accusations of management wrongdoing, the program has thus far shown little to confirm its promise to provide useful environmental information to the scientific research community. Indeed, from SIVAM's inception, national security concerns of the Brazilian executive branch (first at the defunct Secretariat for Strategic Affairs and later the Ministry of Defense) have politically controlled the initiative.[3] This control has created a contradictory image. The most visual elements of SIVAM thus far belong to the Air Force air defense project. Nevertheless, SIVAM's proponents have accentuated its environmental protection capabilities in order to secure loans (particularly from within Brazil and from

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Author's Note: This article responds to comments made during a seminar entitled "Brazil's SIVAM Project: Implications for Security and Environmental Policies in the Amazon Basin," which was held at the Woodrow Wilson International Center for Scholars in Washington, DC on 14 June 2000. The views expressed in this article are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. government.

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international "green money" lenders) and to justify expenses for the project. Of the total twenty-year SIVAM budget of US $1.395 billion, the Export-Import Bank of the United States is financing 73.3 percent through the Bank of Brazil. Raytheon is financing 17.1 percent, and the Swedish Export Credits Guarantee Board (EKN) is providing Ericsson the other 6.1 percent. This is an interesting combination of funding partners for a program that has promised to prioritize environmental monitoring along with conventional air defense and law enforcement needs.

Although future analysts will be able to assess the program and review the issues surrounding its political installation, this article aims to raise awareness of the *need* for evaluation of the objectives and implementation of SIVAM in its human security aspects. In particular need of evaluation are the program's promises to increase scientific knowledge about the regional environment in order to inform sustainable development policies. Due to the absence of open sources regarding how SIVAM will gather, process, and analyze data, it is very difficult for an outside observer to elaborate extensively on the

program. Current public information about SIVAM's progress is limited. But one ought to at least start asking questions both about the transparency of the program and the criteria for evaluating the Brazilian government's commitment to using SIVAM for not only national security but also for environmental data-gathering and social objectives.

This article relates each of the initial stated aims for the program and then attempts to sketch out how SIVAM is or is not addressing these aims. First, the article addresses the issue of the program as *an instrument for Brazilian national defense.* SIVAM is primarily an air traffic control system to support air reconnaissance and interdiction; yet its formulation differs remarkably from the approach adopted by proponents of the Integrated System for Air Traffic Control and Air Defense (SISDACTA).[4] Second, the article then (a) examines the "green" (environmental) arguments that authorities continuously use to justify the program, and (b) comments on the uncertain prospects for SIVAM as *a knowledge generating mechanism for both economic development and environmental preservation of the Amazon region in*

Brazil. It is the author's contention that such a mechanism would demand a model of openly providing and exchanging data with the scientific community. Finally, the article concludes that it is uncertain at best whether the well-established security purposes of the project can successfully coexist with its environmental management possibilities. The major risk is that the program will systematically generate data that may not "fit" the scientific needs of research programs. This mismatch would compromise

Brazilian air space. By the late 1980s, only the Amazon region had not been brought under SISDACTA. SIVAM will, in fact, become upon implementation the newest segment of this national system of air defense.

"Command and Control" of the Amazon

One of the key arguments for SIVAM is that the system will enable a more effective presence in and control of the Amazon region by the Brazilian state.

The region's scant population and long boundary lines with neighboring countries amidst impregnable or unfriendly tropical forest have made for permeable borders and unchecked trespassing.

SIVAM's ability to contribute to the scientific knowledge as well as the human security of Brazil's Amazonian region.

SIVAM as an Instrument of Brazilian National Defense

From a historical perspective, SIVAM is a continuation (although under a different conceptualization) of SISDACTA. SISDACTA was an ingenious solution to the difficulties of integrating air traffic control for Brazil. Implemented in the 1970s and 1980s, it is a four-part air traffic control system that covers most of Brazil except for the Brazilian Amazon and Northeast regions.

SISDACTA resulted in efficient air traffic surveillance in southern Brazil. It evolved with the natural growth of Brazil's civil and commercial aviation and the need for effective air traffic control. And for two decades since its implementation, federal public investments in SISDACTA were made steadily and parsimoniously, without significant technical or political challenge. Under the aegis of the Ministry of Aeronautics (which is commanded by the Air Force), the program's authorities have imported radar and communication hardware mainly from France (particularly from the company Thomson-CSF), integrated the hardware with local software development, and produced a "dual-use" system. While SISDICTA is now the integrated civilian and commercial air traffic control mechanism for most of Brazil, it also provides a sophisticated and versatile air defense system (complemented by F-103 Mirages and F-5s air interceptors) for about 50 percent of the

The system's proponents insist that it will provide better information dissemination within the government, enabling authorities to then take more efficient action. President Cardoso has affirmed:

"the SIVAM will be our eye on the Amazon. It will supply information about deforestation and therefore make it possible for us to combat illegal activity more effectively. . .With SIVAM we will no longer have any excuses. Brazilians will have to take account of their responsibility as guardians of the world's largest rainforest" (Gamini, 2000).

The Brazilian Amazon covers about 5.2 million square kilometers (km), roughly the size of Western Europe or the continental United States from its eastern shores to the Rocky Mountains. Forests make up about 4 million square kilometers of the region. For the Brazilian federal government, this area is a well-defined geographic unit that has been the object of public subsidies in investments and special legal regulation—the so-called Legal Amazônia. With a population density of about three inhabitants per square kilometer, with almost 60 percent of its population residing in urban areas, this region presents many challenges to government and those interested in social development of the local population. Its scant population and long boundary lines with neighboring countries amidst impregnable or unfriendly tropical forest have made for permeable borders and for unchecked trespassing. Of Brazil's 16,500 km of land borders, 10,948 km is in the Amazon, running from French Guiana, Surinam, Guyana, Venezuela, Colombia, and Peru to Bolivia (four times the distance

between Madrid and St. Petersburg) (Dreifuss, 2000). On the Brazilian side, there are 11 federal states and 570 municipalities.

These enormous dimensions feed the Brazilian nationalistic imagination in many ways. Alexander López has argued that these preoccupations have two facets: "The first one refers to the nature of the physical space, and the second relates to the international valuation of the physical space" (López, 1998). Most contemporary Brazilian strategists or opinion-makers (exposed to values proposed by the geopolitical thinking that dominated the country's elite during the twentieth century) share the notion that the Amazon is a natural asset reserved for Brazil and that this asset helps to define the country's national power.[5] The prospect of SIVAM as an information generator about the region satisfies this mindset: the system is intended to permit Brazil to concentrate resources where needed to exclude other powers from the region as well as to expand the transformation of the Amazon's natural resources into wealth for Brazilians.

In fact, over the past five years, a new set of expectations for SIVAM's air traffic control capabilities and data generation have been hammered into the general public by the key government agencies, especially the Air Force. For example, at a government seminar in Brasilia, Ambassador Ronaldo Sardenberg— then Brazil's Minister for Special Projects at the Presidency—argued that SIVAM will attend to many political aspects of national interest such as

(a) the intense application of high technology that will change the face of the Amazon; (b) the integration of government in the federal, state, and municipal levels, involving Ministries and many other specific programs such as the Calha Norte,[6] the Economic Ecological Zoning and the Border Area Assistance to Municipalities; (c) the establishment of a very broad agenda for the region, from the integration of the Defense Ministry, the Ministry for Environment, the Ministry of Education, and the Ministry for Special Projects; (d) and the generation of new products as, for example, the addition of the Pro-Amazonia to the Promotec[7] that could generate results of dimension superior to that of SIVAM (Centro de Estudos Estratégicos, 1999, page 4).

At the same seminar, the Brazilian Minister of Environment, Mr. José Sarney Filho, argued strongly for those features of the system that would permit air traffic control to aid in environmental protection, territorial defense, and curbing criminal activities. These two messages are representative of the Brazilian government's aspirations for the project; therefore, these aspirations must also serve as a guide for future evaluation criteria.

The interest in implementing SIVAM on grounds of national security arises primarily from the notion that Brazil's sovereignty is at risk from (a) foreign covetousness (*cobiça*) of the Amazon territory, (b) illegal cross-border activities, and (c) other potential consequences of conflicts currently observed in neighboring countries (such as Colombia). This overall argument for sovereign "command and control" is the catalyst mobilizing internal political support within the federal government for funding SIVAM. Simultaneously, the environmental monitoring and sustainability arguments have been persistently presented to the Brazilian political spectrum (both members of Congress and opinion-makers) to justify the program's costs and to generate legitimacy.[8] In the words of SIVAM Chief Director Brigadier General José Orlando Bellon,

the problem with the Amazon has been that the state has not been able to make its presence felt sufficiently. SIVAM is a response to those who say we have not taken proper care of the Amazon. It will help us in the task of fostering renewable activities that will preserve the forest and clamp down on destructive forces (Gamini, 2000).

The idea that foreigners covet the Amazon has its roots in the continued interpretation of some events in 19th century Brazilian history, when agents of several foreign powers are reputed to have had schemes for taking control of the potential riches hidden under the tropical jungle cover. This view continued into the 20th century with the questioning (by politicians as well as agents of foreign governments) of Brazil's capacity and will to retain, develop, and protect its Amazonian territory.[9] Today, this concern is still shared across the Brazilian political spectrum. Both the Brazilian Navy Commandant Chagas Telles and Deputy José Genoíno (member of the opposition Labor Party) share the view that foreign political interests want to take advantage of Brazil's vulnerabilities and challenge the country's sovereignty in the region by posing arguments to internationalize the lands in the Amazon ("Forças Armadas," 2000; Genoíno, 2000). The notion is also strongly held in

many opinion-making circles within the Brazilian security sector.

As pollution and environmental destruction and degradation increase in many other places worldwide, this mindset has combined with increasing global demands on and for natural resources to sharpen the suspicion of many Brazilians. Many believe that foreign powers will indeed seek to exploit and control resources in the Amazon. For example, the Amazon Basin retains approximately 20 percent of the fresh water available in the world. As the distribution of and access to potable water become increasing challenges to public managers in many areas of the world, the notion that Amazon water is valuable and exploitable (even siphonable) by foreign powers has

the growth of other illicit and widespread activities in the Brazilian Amazon are placing pressure on Brazil to assert its control. Key among these activities are: (a) illegal occupation and exploration of soil and resources on private, reserve, and other federal lands; (b) criminal activities such as non-authorized mining and minerals trade; (c) logging and smuggling of precious wood; (d) capture and trade of bio-assets; (e) small arms trade; and (f) trickling migration.

Although such activities existed until now without a major "national security" reaction from the authorities, the recent growth of drug trafficking has exposed lawlessness in many parts of the region and revealed the Brazilian government as too weak to counter these challenges. Human movements by

> **Many Brazilians believe that foreign powers will indeed seek to exploit and control resources in the Amazon.**

become common currency among those Brazilians sensitive to such potential challenges. There are also arguments that foreign scientists, firms, and governments will undertake illegal research in the Amazon and gather its species without authorization in order to garner secret Amazonian jungle marvels that will eventually cure diseases and provide the key to human youthfulness, among many other benefits.

The Rise of Illegal Activity

But the issue of scientific discovery and ownership—voiced by local populations, scientists, and businessmen—might also actually be a legitimate concern and not merely a political banner used by government authorities or hysterical nationalistic voices. In fact, a broad spectrum of increasing illicit activity across the permeable borders and sparsely populated areas of the Brazilian Amazon also fuels the country's growing concerns regarding governance among the local populations, government authorities, and others interested in the region. These transnational criminal activities are increasing as the Brazilian state continues to have difficulty fully exercising its presence in and authority over the region.

For example, gold and diamonds are being smuggled through Brazil's border with Guyana as an increasing number of Brazilians cross into that country to prospect for minerals. Numerous small aircraft flights between Brazil and Venezuela or Brazil and Colombia are going untracked. And the expansion of drug-trafficking practices from Colombia as well as

ground, river, and air are now an essential part of a picture that includes Brazil in the Colombian internal struggle and international drug problem. The particularly active presence of the United States in its "war against drugs" in Colombia as well as the U.S. demand for trafficking interdiction in transient areas in the Amazon has provoked calls in Brazil both to improve its law enforcement and to coordinate those actions with neighbors.

The Amazon's integrity has thus become not just a question of law enforcement but also an issue of security. Brazilian authorities plan to use SIVAM to map areas of human presence and activities as well as movements and settlements—legal or illegal. This information would then be fed to police and other state authorities in an effort to better repress illegal activities. Brazilian authorities hope that SIVAM's expected combination of detection, interception, and authorization for destruction will (a) deter air shipment of illegal drugs through Brazil, (b) prevent the country from sinking further into this strategic regional problem, and (c) reduce incentives for Brazilians to break the law and join drug-trafficking activities. These goals will provide a wide field of criteria for evaluating the program.

SIVAM's remote-sensing and surveillance aircraft certainly provide FAB with a new level of technology and operational capacity. Once fully operational, SIVAM will provide FAB with a capacity for conventional interception operations (at least detection and vectoring) that the Air Force has argued it has

lacked to date—thus addressing the perceived need for anti-drug operations over the Amazon region. A Brazilian federal law enacted in 1998 gives the country's president the authority (including delegation down the chain of command) to order the destruction of any aircraft that does not respond to identification requests or obey air traffic control instructions as it moves into Brazilian airspace.[10] This authority, a key feature of a future implementation of interception operations under SIVAM, is equivalent to measures enacted by Brazil's neighbors and could be an instrument of coercive measures against drug air trafficking. The new airborne early warning capability associated with the modernization of FAB's interceptors in the coming years will also provide Brazil with unmatched conventional warfare air defense in the region, fulfilling the long-held Brazilian Air Force aspiration for much greater combat effectiveness.

The additional possibility of foreign guerrillas moving across Brazilian borders—especially from Colombia—and seeking sanctuary, logistic support, or political sympathy offers yet another justification for SIVAM. Guerrillas could harm Brazilian citizens, challenge authorities, and even recruit locals to their cause. In addition, the issues of hot pursuit, operations close to Brazilian territory by Colombian military forces, or unauthorized flights into Brazilian airspace (especially by the United States) create concerns for and pose challenges to Brazilian sovereignty. These prospects underlie the interest that the FAB has had in commanding the overall SIVAM program since its inception. As previously noted, program funds have been earmarked mostly for the purchase of hardware such as aircraft and radar. This equipment addresses the FAB's demands for surveillance systems of the region as well as for modernization. In theory, the system's dual-use capability allows for both detection of illegal flights of small aircraft and for environment monitoring of real-time events (such as forest fires) or for mapping and assessing deforestation, land use, or forest coverage changes. But although promotional rhetoric for the program indicates that it will also install many environmental sensors, the operational specifications of these sensors or what type of data they will provide remains unclear.

In traditional national security terms, therefore, SIVAM could provide great improvement for Brazil's preventive measures and repressive mission control in the Amazon (both for police and for conventional military forces). It also is a symbolic response to threat, expressing Brazil's will to take effective control of its sovereignty over the Amazon and to defend it more efficiently. But the project also demands a new logic in foreign affairs and defense policy: it will need to respond to the perception that Brazil is procuring weapons systems that might upset a conventional arms balance with its neighbors or break the region's confidence-building atmosphere that has come so far in the last decade.

GENERATING KNOWLEDGE FOR DEVELOPMENT AND SUSTAINABILITY

The second fundamental measure of SIVAM's effectiveness refers to the repeated official promise that the program will be a significant generator of data and information for (a) local and regional management and (b) the integration of the region into Brazil's efforts at economic development and environmental preservation. In a 1999 statement to the Brazilian Senate on the purpose of SIVAM, Brazilian Minister of Defense Dr. Élcio Álvares said:

> The purpose of the SIPAM (The System for Protection of the Amazon)/SIVAM project is to integrate, to evaluate, and to disseminate *conhecimentos* (knowledge) that can permit global and coordinated actions of government agencies in the Amazon Region in order to take advantage of its resources. The project will contribute mainly to environmental protection, control of land occupation and its use, surveillance and border control, prevention and fight against endemic and epidemic diseases, civil defense, identification and combat of illicit activities, protection of indigenous peoples' lands, and control of air traffic, river movements, and others (Álvares, 1999).

In order to meet the goals listed by Minister Álvares, the system will have to strive to generate and disseminate information to be used by other sectors. If this is the key argument to justify and gather political support for the program, then SIVAM's relationships with consumers of its data should be a basic avenue for evaluating its effectiveness. Other authorities have also emphasized that information from SIVAM can and will be used for better governance and social progress in the region (Centro de Estudos Estratégicos, 2000).

But consultations between SIVAM officials and the program's potential consumers (such as governing

authorities, bureaucrats, scientists, investors, individuals, and nongovernmental organizations) have to date been few or very narrow. Those that have occurred have certainly been not at all the kind of exchanges that will help establish the epistemological model necessary to link data generated by SIVAM with the information demanded by these potential consumers. As SIVAM is essentially managed by the Air Force with extensive supervision by the Defense Ministry, the traditional military culture of secrecy and self-sufficiency may well result in the autonomous and closed development of the project—with further

Force and its foreign technological suppliers. For Câmara, SIVAM is conceived of as a centralized information processing system run by the military—a concept that contrasts with the non-hierarchical networking features now afforded scientific discourse by the Internet. The Internet counters the traditional lack of Brazilian interagency interaction as well as the lack of information exchange between the Brazilian government and non-official organizations; it also takes advantage of existing networks already in place for data generation about the region. If SIVAM were to adapt the Internet as its tool of exchange, Câmara

> The basic disconnection between SIVAM and the need for scientific data is that no one knows if the data generated is what scientists need.

secrecy standards, new information flow filters, limited research and development opportunities, and only a few technological partners/contractors (and these mostly from abroad). The Brazilian law and security enforcement subculture also may have reduced the project's transparency and information dissemination in the name of preserving the level of secrecy required for "national security" or law enforcement missions. The major issue is that the Air Force will control the flow of the information to other parties, including to organizations outside the security community. How this will be done is not clear. Therefore, an objective assessment of SIVAM's effectiveness of the information generation procedures and their use may not be possible at this point.

However, there is little evidence to date to show that the Brazilian government will be able (a) to integrate SIVAM with other information platforms or programs in the region, (b) to develop the expected multi-program articulation for local socioeconomic development, or (c) to induce SIVAM's managers to focus on anything other than the program's output for national security.

Indeed, there is currently silence from the Brazilian government on how to link these ends. As Gilberto Câmara has pointed out, there is a lack of clear evidence that SIVAM's "technical reasoning" (its hardware and logistics) is being matched by an effort to lay down tracks for "interpretative reasoning" of the climate, biodiversity, and human security data and information the program promises to deliver. Câmara has suggested that the engineering nexus of the program has failed to include the contributions of individuals and agencies outside the circles of the Air

argues, the program would generate an extensive information base that could be analyzed by proven methodological instruments (Câmara, 1999). The basic disconnection between SIVAM and the need for scientific data is that no one knows if the data generated is what scientists need. In contrast, a project such as the Large Scale Biosphere-Atmosphere Experiment in Amazonia-LBA has been developed in an integrated fashion with a diverse number of research projects (Project LBA, 2001).

Past Failures and Integrative Weakness

The integration of other federal programs in the Amazon region has already met with failures in the past decade. For example, SIPAM was to be a strategic umbrella concept for a "holistic" protection of the region. But SIPAM has never made any progress and in fact has been rejected by all bureaucracies; not even the Office of the Presidency has been able to find a proper "fit" for the idea. Its coordination was finally moved to the Defense Ministry in 1999, running the risk that SIPAM's "protection" mandate may now take on a "national defense" connotation. Its logic could now be subordinated to the actual physical implementation of SIVAM.

This recent history of civilian inability to harness resource allocation and full implementation of "sensitive" programs in the Amazon continues. The Border Area and the North Arch, two other federal projects initiated by the same Secretariat for Strategic Affairs, have now also either lost support of the executive or been taken over by the Defense Ministry for administration and funding. Interagency coordination is a central issue that President Cardoso

recognizes as he calls for greater integration, for instance, regarding the need to protect against fires in the region (*"Presidente,"* 2000). But fragmentation has been the dominant feature of federal programs for the Amazon, and this will continue to be a challenge to SIVAM's effectiveness.

The potential effectiveness of SIVAM could also be hindered if it is not vertically integrated with local and state governments. Since 1988, the Brazilian constitution has limited the actual authority of the federal government to command a centralized policy; greater power has been given to states and

A Lack of Bridging

SIVAM's other potential environmental disappointment regards its actual production of data for environmental monitoring. For example, the project promises to fund 200 stations to monitor water resources and 20 to monitor weather. But what more information will SIVAM provide than that already produced by other government agencies such as the National Institute for Space Research (INPE), the Ministry of Agriculture's weather service, or the Brazilian Institute for Natural Environment (IBAMA)? Such inconsistencies and redundancies cloud the

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The knowledge produced by a SIVAM oriented towards human and environmental security could even change perceptions about the scope of threat to the region—broadening it beyond organized crime or border control to include the possibility that human presence may destroy the ecology of the Amazon through unrestrained deforestation.

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municipalities. The Brazilian Amazon has nine federative political units with governors who control local politics and take advantage of a disproportionately superior representation in the National Congress. This devolution of power has hindered the balance that can be struck in the Amazon between local social development (driven by local politicians) and environmental protection efforts committed by the federal legislation and programs. Yet such a balance is becoming increasingly critical as market forces and new programs provide stimuli for new Amazonian economic ventures and continued traditional clearing of jungle areas for agriculture.

The vast areas of the Amazon, the limited means of transportation and communication available there, and the difficulties in setting up logistical infrastructure in the region have been factors limiting the intrusion of human presence. But migration into the Amazon continues. Consequently, federal investments, subsidies, assistance, and spending in the region that would address the need for environmental protection have suffered from budgetary limits, from bureaucratic disputes over scarce political attention, and from bottom-up exercises of local and state-level politics in the actual allocation of resources. Corruption scandals such as those under investigation in SUDAM (a major public agency for economic project financing in the Amazon) also dampen confidence in the role of the public sector to manage effectively the region's policy.

prospects for SIVAM as an effective tool for conservation.

As noted above, little evidence is also available of effective bridging between scientific proposals and the project's information modeling process. As Valter Rodrigues points out, the "sustainable development standards" SIVAM is supposed to be promoting have yet to be determined (Rodrigues, 2000). While one may find news from SIVAM that it is linking the project's development with significant institutions in the scientific community in Brazil, the only evidence of these links is the promotion on SIVAM's official Web site of regional seminars between the project's core administration and local research institutions to "transfer technology" and "develop joint projects." The scope and impact of such common efforts are left unspoken (SIVAM, 2001).

And contrary to the claims of SIVAM's managers that there is increasing scientific participation in shaping the project, there are in fact important major scientific absences. The Internet home pages of organizations such as the Brazilian Council for Scientific and Technological Development (CNPq) (Conselho Nacional, 2001), the Brazilian Society for the Progress of Science (SBPC) (Sociedade Brasileira, 2001), or Brazil's National Academy of Science (ABC) (Academia Brasileira, 2001) give no news of their respective involvements with SIVAM.[11] If SIVAM is to become a valid tool for scientific knowledge to assist sustainable development in the region, the

participation of leading nongovernmental entities such as these should share both the burden of the intellectual logic of the system and the specification for scientific information needed.

In addition, if international cooperation is a mainstay in the conduct of Brazilian foreign policy in the Amazon region, what role does SIVAM play in support of this aim? This is another unanswered question regarding the information on and sharing of SIVAM's technology and "know-how." Given the great products the system is projected to provide, it would be helpful to extend participation and sharing of ideas with neighbors, even in the conception phase. But again, no significant efforts in this regard are identifiable.

The knowledge produced by a SIVAM oriented towards human and environmental security could even change perceptions about the scope of threat to the region—broadening it beyond organized crime or border control to include the possibility that human presence may destroy the ecology of the Amazon through unrestrained deforestation. The generation of knowledge regarding strategic human, group, and international interactions in the Amazon will have little utility unless it includes scientific information about the region's natural cycles and the management of its human presence with environmental sustainability efforts.

THE NEED FOR BROADER PERSPECTIVES

Perhaps the greatest contribution made thus far to broadening the definition of security in the Amazon comes from an unexpected quarter: Senator Marina Silva, who represents the Brazilian state of Acre. She is a *cabocla*, a former farm worker who, after making her livelihood from extractive activities in the jungle, became a labor leader and then a representative both in the state house of Acre and later in the Federal Senate. Ms. Silva has a different perspective on security in the Amazon:

[I]n relation to the Amazon, as an asset threatened, I believe that one of the most important and significant threats we experience results from wrong policies implemented after the end of the extractive cycles and the introduction of models centered on large [agricultural] projects. The threat results from misleading perspectives. The first mistake is to consider the Amazon as

an empty demographic space. The second mistake is to consider the Amazon as a homogenous forest. The third mistake is to think of development in the Amazon and not of the Amazon. Development in the Amazon makes us think of defense policy in the Amazon as large projects in the Amazon, as actions of government in the Amazon, instead to think of a process of endogenous development, where the Amazon [environment] itself can generate its own responses. From this matrix of misleading perspectives results a series of mistakes that causes the Amazon [region] to be seen, not only by us *Amazonidas,* but also by all Brazilian people and even by those from abroad, as a [natural] asset under threat. The idea of such large projects produced the destruction of 13,000 km^2 [of forest] burnt in [1998]. If we continue at this destructive pace, in thirty or fifty years, and this is the truth, there will be no more Amazon [forest]. I am not the one affirming this, but these are the conclusions of technical research from alternative sources and from those conducted by the government through official research institutes themselves [such as INPE] (Silva, 1999).

The concept guiding SIVAM is a clever and practical approach both to preserving Brazil's sovereignty and law enforcement and to generating information for social and scientific development. As a result, it will vastly increase Brazil's air defense capabilities for both conventional and classic air defense as well as for law enforcement. But SIVAM's implementation risks being deficient for environmental purposes because of its uncertain model of information gathering and dissemination. Probing (a) how this model is set, and (b) how it could eventually function in harmony with information needed for scientific development and local management are keys to ensuring SIVAM's success as a tool for environmental security. As the program stands, however, SIVAM's full utility as an instrument for human security in the Amazon region is being endangered by the lack of transparency in its conceptualization and implementation. How the evaluation process of the program evolves is a key to its success in meeting the expectations of the Brazilian taxpayers, citizens, and others concerned with the protection of the Amazon as a unique and significant natural environment on the planet. W

ENDNOTES

[1] For detailed information provided by the administrators of the program, see "Raytheon" (2000).

[2] As of May 2001, the first ERJ-145s had been delivered and are under operational testing, regional centers were being constructed and equipped, and first radars were under experimental testing.

[3] Representatives of the Labor Party have echoed the doubts expressed by the Brazilian Society for the Progress of Science (SBPC) with regard to the project's relative lack of Brazilian technology suppliers. For example, Senator Eduardo Suplicy has argued that "scientists members of SBPC are warning that SIVAM…could avoid spending US $1.438 billion dollars, as proposed by Raytheon, and [could] be undertaken [for] US $927 million using both national industries and technology" (Suplicy, 1996).

[4] In the early development of SISDACTA in the 1970s, the absence of an effective air control system (especially for commercial aviation) made it politically easy also to construct an intelligence component to the program, yielding a "dual-use" system.

[5] The classical Brazilian geopolitical views are fundamentally derived from Couto e Silva (1967).

[6] The Calha Norte ("North Arch Project") is an effort to increase state control in the border region from the Atlantic coast to Peru. Since most federal agencies, particularly the Ministries of Education, Health, and Economy, do not assign priority to investments or to posting officers in that region, Calha Norte has evolved to be a Brazilian Army-run administration. Local municipalities are assisted with sanitation, health, education, and management activities. Financial resources have been continuously shorter than actual budgetary demands.

[7] Pro-Amazonia and Promotec are programs run by the Ministry of Justice to increase law enforcement in the Amazon region.

[8] For arguments emphasizing the environmental promises of SIVAM, see for example the words of Brigadier General José Orlando Bellon, SIVAM's Chief Director, in "SIVAM funcionará" (1999).

[9] The perception that there are forces or conspiracies that want to internationalize Brazilian Amazonian territory has been part of the Brazilian political vocabulary for some time. The United States is considered a key conspirator in this reputed Amazonian internationalization effort. Advocates of Brazilian vigilance against such an effort identify U.S. Navy Captain Mathew Fawry's suggestion in 1817 to the U.S. Secretary of State about forming a sovereign country in the Northern Amazon as the first overt manifestation of U.S. interest in controlling the region. Between 1989 and 1992, many indirect and direct comments of U.S. officials (such as those of then-Senator Al Gore challenging Brazil's sovereignty in the region) have given credence to the perception of this threat. Original documentation regarding these allegations is not forthcoming. No primary sources are provided by those who hold these fears. But references to the past feed present arguments, and periodically new fears are raised as the issue reappears on the agenda of strategic debates in many circles— especially in more nationalistic ones such as the Escola Superior de Guerra and its alumni associations throughout the country, or the Military Club, a social club of retired military officers in Rio de Janeiro. The arguments are presented by Chagas (1997).

[10] For the transcript of this law and comments on it, see Correia (2000).

[11] For the official argument of current scientific participation, see Site Oficial (2001).

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COMMENTARIES

THE U.S. NATIONAL INTELLIGENCE COUNCIL'S *GLOBAL TRENDS 2015:* EXCERPTS, COMMENTARIES AND RESPONSE

In January 2001, the U.S. National Intelligence Council (NIC), a center within the Central Intelligence Agency that provides the agency's directory with mid- and long-term strategic thinking and direction, published Global Trends 2015: A Dialogue About the Future with Nongovernmental Experts.*" This unclassified and public report, which expanded on the NIC's previous effort* Global Trends 2010*, takes a look at the world over the next 15 years from the perspective of the national security policymaker.*

Produced in consultation with experts outside the intelligence community from academia, think-tanks, and the corporate world, Global Trends 2015 *identifies worldwide seven dynamics or "drivers" (such as demographic trends, natural resources, globalization, and the role of the United States) and estimates their impact in an effort to produce a comprehensive picture of the world in 2015. In his introductory letter to the report, then-NIC Chairman John Gannon wrote that* Global Trends 2015 *"should be seen as a work-in-progress, a flexible framework for thinking about the future that we will update and revise as conditions evolve. As such, we are pleased to share it with the public, confident that the feedback we receive will improve our understanding of the issues we treat. We welcome comments on all aspects of this study."*

The Environmental Change and Security Project invited a wide range of scientists, government officials, nongovernmental activists, and defense analysts from across the globe to write commentaries on any aspect of Global Trends 2015 *that struck them. Fourteen responded, and their commentaries follow the below excerpts of the report itself. Finally, Ellen Laipson, acting chairman of the NIC, responds at length to the commentaries. We are pleased and proud to present this fertile exchange.*

The full text of Global Trends 2015 *is available in print form from the National Intelligence Council and on the web at http://www.cia.gov/cia/publications/globaltrends2015*

Over the past 15 months, the National Intelligence Council (NIC), in close collaboration with U.S. Government specialists and a wide range of experts outside the government, has worked to identify major drivers and trends that will shape the world of 2015.

The key drivers identified are:

(l) Demographics.
(2) Natural resources and environment.
(3) Science and technology.
(4) The global economy and globalization.
(5) National and international governance.
(6) Future conflict.
(7) The role of the United States.

In examining these drivers, several points should be kept in mind:

• No single driver or trend will dominate the global future in 2015.

• Each driver will have varying impacts in different regions and countries.

• The drivers are not necessarily mutually reinforcing; in some cases, they will work at cross-purposes.

Taken together, these drivers and trends intersect to create an integrated picture of the world of 2015, about which we can make projections with varying degrees of confidence and identify some troubling uncertainties of strategic importance to the United States.

The Methodology

Global Trends 2015 provides a flexible framework to discuss and debate the future. The methodology is useful

for our purposes, although admittedly inexact for the social scientist. Our purpose is to rise above short-term, tactical considerations and provide a longer-term, strategic perspective. Judgments about demographic and natural resource trends are based primarily on informed extrapolation of existing trends. In contrast, many judgments about science and technology, economic growth, globalization, governance, and the nature of conflict represent a distillation of views of experts inside and outside the United States Government. The former are projections about natural phenomena, about which we can have fairly high confidence; the latter are more speculative because they are contingent upon the decisions that societies and governments will make.

The drivers we emphasize will have staying power. Some of the trends will persist; others will be less enduring and may change course over the time frame we consider. The major contribution of the National Intelligence Council (NIC), assisted by experts from the Intelligence Community, has been to harness US Government and nongovernmental specialists to identify drivers, to determine which ones matter most, to highlight key uncertainties, and to integrate analysis of these trends into a national security context. The result identifies issues for more rigorous analysis and quantification.

THE DRIVERS AND TRENDS

Demographics

World population in 2015 will be 7.2 billion, up from 6.1 billion in the year 2000, and in most countries, people will live longer. Ninety-five percent of the increase will be in developing countries, nearly all in rapidly expanding urban areas. Where political systems are brittle, the combination of population growth and urbanization will foster instability. Increasing lifespans will have significantly divergent impacts.

In the advanced economies—and a growing number of emerging market countries—declining birthrates and aging will combine to increase health care and pension costs while reducing the relative size of the working population, straining the social contract, and leaving significant shortfalls in the size and capacity of the work force.

In some developing countries, these same trends will combine to expand the size of the working population and reduce the youth bulge—increasing the potential for economic growth and political stability.

Natural Resources and Environment

Overall food production will be adequate to feed the world's growing population, but poor infrastructure and distribution, political instability, and chronic poverty will lead to malnourishment in parts of Sub-Saharan Africa. The potential for famine will persist in countries with repressive government policies or internal conflicts. Despite a 50 percent increase in global energy demand, energy resources will be sufficient to meet demand; the latest estimates suggest that 80 percent of the world's available oil and 95 percent of its gas remain underground.

In contrast to food and energy, water scarcities and allocation will pose significant challenges to governments in the Middle East, Sub-Saharan Africa, South Asia, and northern China. Regional tensions over water will be heightened by 2015.

Science and Technology

. . .the world will encounter more quantum leaps in information technology (IT) and in other areas of science and technology. The continuing diffusion of information technology and new applications of biotechnology will be at the crest of the wave. IT will be the major building block for international commerce and for empowering nonstate actors. . . The integration—or fusion—of continuing revolutions in information technology, biotechnology, materials science, and nanotechnology will generate a dramatic increase in investment in technology, which will further stimulate innovation within the more advanced countries. Disaffected states, terrorists, proliferators, narcotraffickers, and organized criminals will take advantage of the new high-speed information environment and other advances in technology to integrate their illegal activities and compound their threat to stability and security around the world.

The Global Economy and Globalization

Th[e] globalized economy will be a net contributor to increased political stability in the world in 2015, although its reach and benefits will not be universal. In contrast to the Industrial Revolution, the process of globalization is more compressed. Its evolution will be rocky, marked by chronic financial volatility and a widening economic divide.

The global economy, overall, will return to the high levels of growth reached in the 1960s and early 1970s. Economic growth will be driven by political pressures for higher living standards, improved economic policies, rising foreign trade and investment, the diffusion of information technologies, and an increasingly dynamic private sector. Potential brakes on the global economy—such as a sustained financial crisis or prolonged disruption of energy supplies—could undo this optimistic

projection.

Regions, countries, and groups feeling left behind will face deepening economic stagnation, political instability, and cultural alienation. They will foster political, ethnic, ideological, and religious extremism, along with the violence that often accompanies it. They will force the United States and other developed countries to remain focused on "old-world" challenges while concentrating on the implications of "new-world" technologies at the same time.

National and International Governance

States will continue to be the dominant players on the world stage, but governments will have less and less control over flows of information, technology, diseases, migrants, arms, and financial transactions, whether licit or illicit, across their borders. Nonstate actors ranging from business firms to nonprofit organizations will play increasingly larger roles in both national and international affairs. The quality of governance, both nationally and internationally, will substantially determine how well states and societies cope with these global forces.

States with competent governance, including the United States, will adapt government structures to a dramatically changed global environment—making them better able to engage with a more interconnected world. The responsibilities of once "semiautonomous" government agencies increasingly will intersect because of the transnational nature of national security priorities and because of the clear requirement for interdisciplinary policy responses. Shaping the complex, fast-moving world of 2015 will require reshaping traditional government structures.

Effective governance will increasingly be determined by the ability and agility to form partnerships to exploit increased information flows, new technologies, migration, and the influence of nonstate actors. Most but not all countries that succeed will be representative democracies.

States with ineffective and incompetent governance not only will fail to benefit from globalization, but in some instances will spawn conflicts at home and abroad, ensuring an even wider gap between regional winners and losers than exists today.

Globalization will increase the transparency of government decision-making, complicating the ability of authoritarian regimes to maintain control, but also complicating the traditional deliberative processes of democracies. Increasing migration will create influential diasporas, affecting policies, politics and even national identity in many countries. Globalization also will create increasing demands for international cooperation on

Global Population: 1950-2015

Total
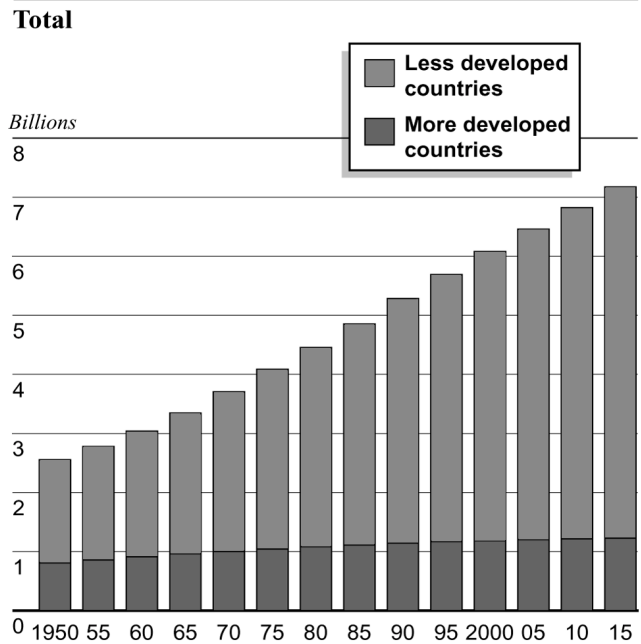
Source: US Bureau of the Census.

Growth Rates
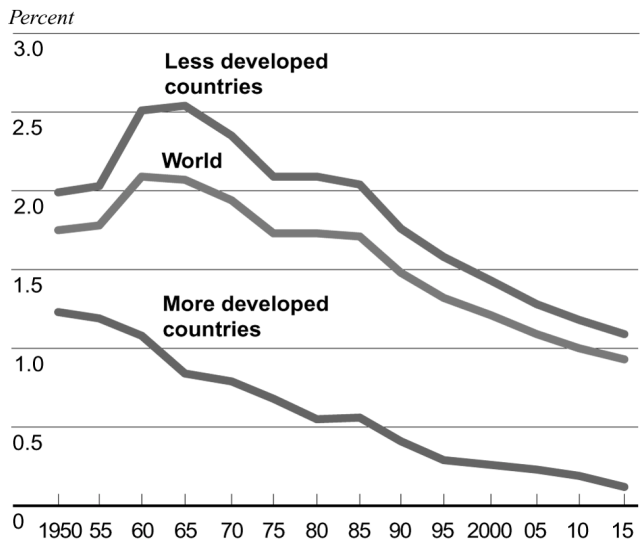
Source: US Bureau of the Census.

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From NIC *Global Trends 2015*

transnational issues, but the response of both states and international organizations will fall short in 2015.

Future Conflict

. . .The risk of war among developed countries will be low. The international community will continue, however, to face conflicts around the world, ranging from relatively frequent small-scale internal upheavals to less frequent regional interstate wars. The potential for conflict will arise from rivalries in Asia, ranging from India-Pakistan to China-Taiwan, as well as among the antagonists in the Middle East. Their potential lethality will grow, driven by the availability of WMD, longer-range missile delivery systems and other technologies.

Internal conflicts stemming from religious, ethnic, economic or political disputes will remain at current levels or even increase in number. The United Nations and regional organizations will be called upon to manage such conflicts because major states—stressed by domestic concerns, perceived risk of failure, lack of political will, or tight resources—will minimize their direct involvement.

Role of the United States

The United States will continue to be a major force in the world community. US global economic, technological, military, and diplomatic influence will be unparalleled among nations as well as regional and international organizations in 2015. This power not only will ensure America's preeminence, but also will cast the United States as a key driver of the international system.

Diplomacy will be more complicated. Washington will have greater difficulty harnessing its power to achieve specific foreign policy goals: the US Government will exercise a smaller and less powerful part of the overall economic and cultural influence of the United States abroad. . .

KEY UNCERTAINTIES: TECHNOLOGY WILL ALTER OUTCOMES

Examining the interaction of these drivers and trends points to some major uncertainties that will only be clarified as events occur and leaders make policy decisions that cannot be foreseen today. We cite eight transnational and regional issues for which the future, according to our trends analysis, is too tough to call with any confidence or precision.

Science and Technology

. . .Advances in science and technology will generate

dramatic breakthroughs in agriculture and health and in leap-frog applications, such as universal wireless cellular communications, which already are networking developing countries that never had land-lines. What we do not know about the S&T revolution, however, is staggering. We do not know to what extent technology will benefit, or further disadvantage, disaffected national populations, alienated ethnic and religious groups, or the less developed countries. We do not know to what degree lateral or "side-wise" technology will increase the threat from low technology countries and groups. One certainty is that progression will not be linear. . .

Asymmetric Warfare

IT-driven globalization will significantly increase interaction among terrorists, narcotraffickers, weapons proliferators, and organized criminals, who in a networked world will have greater access to information, to technology, to finance, to sophisticated deception-and-denial techniques and to each other. Such asymmetric approaches—whether undertaken by states or nonstate actors—will become the dominant characteristic of most threats to the US homeland.

The Global Economy

Although the outlook for the global economy appears strong, achieving broad and sustained high levels of global growth will be contingent on avoiding several potential brakes to growth. These include:

- *The US economy suffers a sustained downturn;*
- *Europe and Japan fail to manage their demographic challenges;*
- *China and/or India fail to sustain high growth;*
- *Emerging market countries fail to reform their financial institutions;*
- *Global energy supplies suffer a major disruption.*

The Middle East

Global trends from demography and natural resources to globalization and governance appear generally negative for the Middle East. . . Linear trend analysis shows little positive change in the region, raising the prospects for increased demographic pressures, social unrest, religious and ideological extremism, and terrorism directed both at the regimes and at their Western supporters. . .

China

Estimates of developments in China over the next

15 years are fraught with unknowables. Working against China's aspirations to sustain economic growth while preserving its political system is an array of political, social, and economic pressures that will increasingly challenge the regime's legitimacy, and perhaps its survival. . . Two conditions, in the view of many specialists, would lead to a major security challenge for the United States and its allies in the region: a weak, disintegrating China, or an assertive China willing to use its growing economic wealth and military capabilities to pursue its strategic advantage in the region. These opposite extremes bound a more commonly held view among experts that China will continue to see peace as essential to its economic growth and internal stability... W

THE COSTS OF U.S. MILITARY POWER TO THE ENVIRONMENT AND HEALTH

By Rear Admiral Eugene J. Carroll, Jr, U.S. Navy (Ret.)

Following 37 years active duty in the U.S. Navy, Rear Admiral Carroll joined the Center for Defense Information. He writes and speaks in the United States and abroad on a wide spectrum of national and international security issues. He is a graduate of the U.S. Navy and Army War Colleges and holds an MA in international relations from George Washington University.

United States= national security policies and programs during the next 15 years will have far more effect on international relationships and security conditions throughout the global community in the year 2015 than will any foreseeable technological developments during the same period. This statement is true for two reasons.

First, as the world=s leading economic power and only military superpower, the United States shapes the security policies and programs of every developed nation in the world. America is the only nation to divide the entire globe into military zones and maintain nearly 250,000 highly armed, combat ready forces on foreign soil and seas under the authority of U.S. regional commanders-in-chief. No nation can ignore the immediate presence and power of the United States. Some may be reassured by this power, while others feel threatened. But all are subject to the hegemonic influence of the U.S. military presence.

Second, the military-industrial complex about which President Dwight Eisenhower warned us, abetted by Congressional hawks, has a collective interest in promoting a huge and growing military budget which can be justified only by a continuation of U.S. superpower status around the globe.

These two factors coincide to drive half of all U.S. research and development (R&D) investment into military programs. In 2001 alone, military R&D totaled more than $42 billion (Budget of the United States Government, 2001, page 99). This expenditure exemplifies how America has for more than 50 years led the world in spending for newer and ever more destructive weapons systems. Such budget priorities have diluted the investment capital available to fund advances in such fields as renewable energy systems and other means to reduce global environmental pollution. Similarly, efforts to improve global agricultural production, water management, energy conservation and disease control have been compromised.

It is disappointing, even alarming, that *GT 2015* fails to emphasize the need for major increases in resources to address these growing problems. Instead, the report pays lip service to the existence of Adrivers@ such as food, water supply, energy, and environment without noting the need for major investments to improve conditions globally. Remarkably absent also is any recognition of pandemics such as AIDS. The future is at great risk unless such dangers are recognized as universal threats to humankind, not just pockets of disease in underdeveloped nations. The true costs of maintaining U.S. military dominion globally must be measured not only in the dollars devoted to the U.S. Department of Defense, but also in the consequent opportunity costs of constructive non-military programs that must be foregone because of lack of funding.

Now, based on the work of U.S. Secretary of Defense, Donald Rumsfeld, a bipartisan commission has declared: A...the U.S. must have the capabilities to defend its space assets against hostile acts and to negate hostile use of space against U.S. interests@ (Report of the Commission, 2001, page xi). Since President Bush=s determination to deploy Aa robust@ National Missile Defense (NMD) System necessarily requires at least two new constellations of military satellites, the United States

is now committed to space as a new battle zone. The effect of this will be to intensify U. S. military confrontation of the global community by flaunting our superpower status.

This effort is a particularly significant example of the opportunity costs of excessive investment in dubious military ventures. It also reflects the fact that worldwide expenditures on armaments and military forces still exceed $800 billion annually. *GT 2015* could and should have identified the potential benefits of reducing military spending in order to free funds to deal with the problems it projects.

Furthermore, since no military challenge goes unanswered indefinitely, the NMD initiative will ensure a spiral of counter-efforts, with anti-satellite systems and then anti-anti-satellite systems to follow. In the process, the world=s efforts to deal constructively with the problem of rapid population growth, energy and water shortages, global warming, and environmental pollution will be blunted because the lion=s share of investment in R&D will be diverted from beneficial programs into destructive military measures.

The needs of an interdependent world community increasingly require cooperative approaches to solve mutual problems. U.S. insistence on maintaining and expanding its superpower status through military measures, particularly in space, substitutes confrontation for cooperation. Such a policy can only impoverish the world of 2015 and make it a poorer, more dangerous home for humankind. W

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GLOBAL TRENDS 2015—A DEMOGRAPHIC PERSPECTIVE

By Richard P. Cincotta

Richard P. Cincotta is a senior research associate at Population Action International (PAI) with research experience in North America, Asia and Africa. From 1992-96, he served as a policy fellow at USAID's Population, Health and Nutrition Center. He is co-author (with Robert Engelman) of Nature's Place: Human Population and the Future of Biological Diversity *(PAI, 2000).*

In publishing *GT 2015*, high-ranking members of the U.S. intelligence community have relied on outside voices—"nongovernmental expertise," they call it— to draw attention to those global trends and regional relations that should shape the U.S. government's priorities. I wish them success. These are confusing, out-of-focus times for the makers of U.S. foreign policy. More than a decade after the breakup of the Soviet Union, international relations theorists have yet to find a better description for the era following the Cold War than "the post-Cold War era" (and I have no good suggestions, either).

GT 2015 cuts through some of the confusion. Its publication is evidence that senior U.S. intelligence analysts have accepted many of the conclusions of recent research into the underlying causes of intra-state conflict and state failure—research focused on demographic change, perceived scarcities in critical natural resources, and the state-sanctioned institutions that foster social, economic, and technological adaptation and successful governance.

In the following comment, I focus on *GT 2015's* approach to demographic trends. On the whole, its approach is balanced. To their credit, the NIC's experts account for the economic and social significance of evolving age structure (the *new demography*—not new for demographers, but a new focus for demographic studies on economic development during the 1990s). And they do this without discounting the impact of (a) continued population growth (the *old demography*) in almost all developing countries as well as (b) projected population declines in Russia and several other industrialized countries during the next 15 years (a trend some refer to as the *birth dearth*). Each of these aspects of demographic change are worth comments.

Age Structure

As *GT 2015* suggests, no demographic structure appears potentially more politically volatile or more

economically fragile than the *youth bulge*—the high proportion of youths that is characteristic of the world's remaining high-fertility societies. For example, insurgency movements have been extremely successful recruiting warriors in societies (such as those in the Middle East and in West Africa) that are awash in young, unemployed, and discontented males (Collier & Hoeffler, 1997; Mesquida & Wiener, 2001).

And *GT 2015* also calls attention to *population aging*—the slow transformation of a bulge in the mid-adult range of the world's population into a bulge in the elderly range (65+ years old). This trend (and the challenges it represents for financing health care and retirement systems) confronts Japan and most of the industrialized world. Ultimately, all nations face this inevitable demographic challenge to some degree as they approach population stability (what demographers call a *stationary* population) or population decline. Wisely, *GT 2015* has avoided snap judgements about the economic impact of population aging. This is uncertain terrain. Some countries may be able to maintain somewhat lower ratios of retirees-to-workers by (a) accepting more immigrants, (b) setting retirement back to older ages, or (c) attracting more women into the workforce while making it easier for women to raise children while working. Although reluctant to accept large numbers of immigrants, Japan is currently experimenting with several of these options as well as with returning some of the responsibilities for old-age care back to families (Ogawa & Retherford, 1997; Tolbert, 2000).

But *GT 2015* does less well at identifying countries that by 2015 could benefit from the *demographic dividend*—economic opportunities that are created by quickly-declining fertility and the resultant shift in population age structure. The dividend comes in the form of a low ratio of children and elderly dependents to eligible-for-work adults (called "the dependency ratio"). A low dependency ratio (DR) occurs when fertility declines and the youth bulge (a characteristic of high-fertility societies) matures into a bulge composed of working-age adults. Unless the population structure is dramatically affected by migration or abrupt changes in birth or death rates, very low DRs can be expected to climb again in two to four decades as the worker bulge graduates into a bulge in the elderly population.

Several East Asian nations have already experienced very low DRs, including Japan (DR<0.5 since 1965), and South Korea, Taiwan and Singapore (DR<0.5 since the 1980s). Declines in DRs followed earlier investments in

Figure 1: Estimated and projected trends in the dependency ratio (DR) in China, Europe, Latin America, and Africa, 1985 to 2025
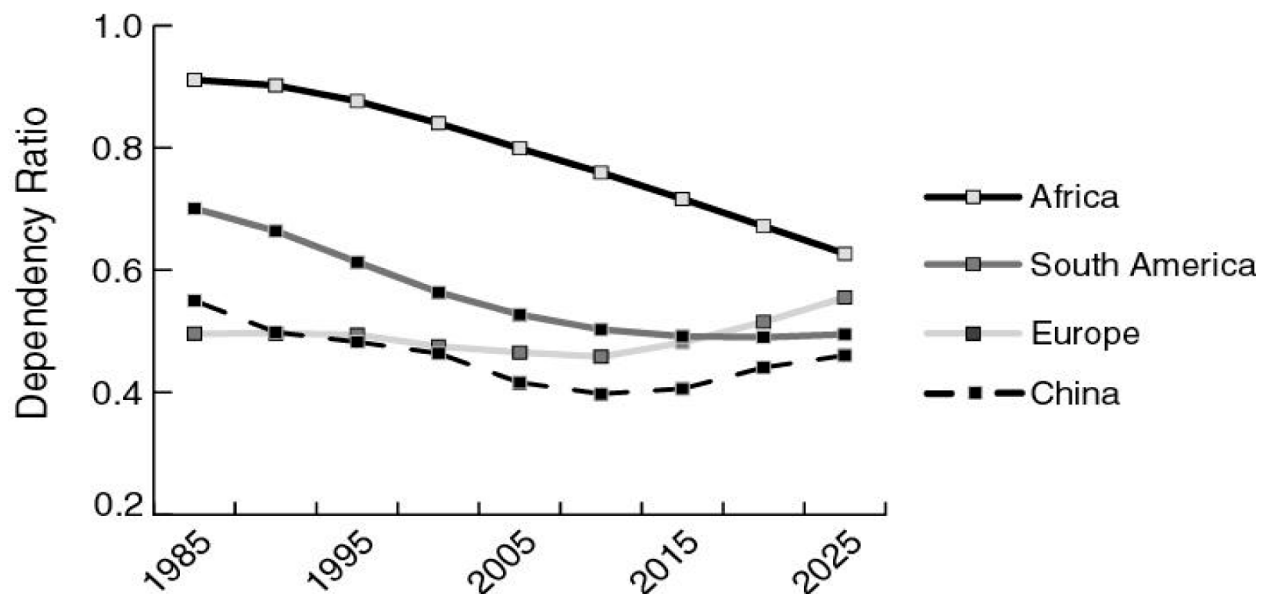
DR is the ratio of the summed populations of children (ages 0-14 yrs) and elderly dependents (ages 65+ yrs) to the population of working age adults (ages 15-64 yrs). The coming period of very low dependency is likely to provide an additional boost to China's growing economy.

Source: UN Population Division (1998).

family planning programs (1960-75) (Tsui, 1996) and efforts to increase girls' school enrollments. When the growth in numbers of school-age children began to slow in these nations, their governments responded by investing more in each student. Within two decades, poorly-trained workforces in these East Asian nations were partially replaced by larger, more educated workforces with smaller average family sizes. Soon after, labor force growth slowed. Wages rose. Workers saved. And governments encouraged financial institutions to invest in the export-oriented, capital intensive industries that could effectively employ a skilled workforce (ADB, 1997; World Bank, 1993).

Which countries are next in line for a demographic dividend? *GT 2015* does not tell us that China's DR should dip very low around 2015 (Fig. 1), or that China appears most likely to make economic gains from its worker bulge, having invested substantially in education—for both girls and boys—during its fertility decline. If current projections hold, China will by 2030 have more educated people of working age than Europe and North America combined (Lutz & Goujon, 2001). By 2015, Thailand, Poland, Tunisia, Costa Rica, Mexico, and Cuba may also be in line to capitalize on their low DRs.

But other countries may have lost or squandered the short-term opportunities created by their own fertility decline. For example, while Brazil and India are set to experience a huge worker bulge around 2015, both have fallen short in efforts to bring basic education to the broad spectrum of their populations (Birdsall, Bruns, & Sabot, 1996; Repetto, 1994). Civil war has crippled Sri Lanka's otherwise promising economy. And while total fertility rate (the expected lifetime childbirths per woman) in South Africa dropped from 6.5 in 1960-65 to about 2.9 today, that nation's demographic dividend will probably slip away because of the tragic decimation of that country's worker bulge by HIV/AIDS.

Population Growth and Decline

World population is now more than 6.1 billion people and is still increasing at roughly 77 million human beings annually (UN Population Division, 2001)—more than was added annually when Paul Ehrlich's *The Population Bomb* was published in 1968. With population actually near stability or dropping within a belt of industrialized countries stretching geographically from Western Europe eastward to Japan, it is apparent that the increases are now concentrated in fewer countries than it was three decades ago. Most of these countries are very poor. Many are politically unstable.

What the relatively slow decrease in numbers will mean in economic terms in some industrial countries—particularly in Russia, where there is high unemployment—is anybody's guess. Japan will be the place to watch. To deal with a shrinking labor force, Japanese industry has invested heavily in technology and automation, and moved labor-intensive manufacturing overseas. For its part, the government has stepped up investments in technical training, research, and development (Bauer, 1995). A recent dramatic downturn in the value of condominiums in Japan could be the first signs of an economy readjusting to perceptions of slowing demand for urban housing. While it is far too soon to tell how well Japan will handle its demographic challenges, it is a good bet that demographers and economists will find Japan's next 15 years worth studying in detail.

High Marks

Global Trends 2015 is excellent work. Those who are professionally concerned with global politics, national security, or military readiness and who have not yet read the NIC's report should do so. With *GT 2015*, the National Intelligence Council has demonstrated that intelligence can be an intelligent, publicly informative vocation[1] — and that taking a hard, educated look into our foreign policy future can be front-page news. **W**

ENDNOTE

[1] To gauge *GT 2015*'s impact, I phoned the U.S. Central Intelligence Agency (CIA) and inquired as to how many copies of the report were sold or downloaded from the NIC Web Site.

A CIA public relations officer replied, and told me, "Unfortunately, the CIA does not divulge that information." Some things never seem to change.

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GOVERNANCE, CONFLICT, AND THE LIMITS OF GLOBALIZATION

By Johanna Mendelson Forman

Dr. Johanna Mendelson Forman is a senior fellow at the Association of the U.S. Army's Role of American Military Power. An expert on security sector reform, civil-military relations, and development, she helped establish USAID's Office of Transition Initiatives in 1994 and has served as a senior social scientist at the World Bank's Post-Conflict Unit.

One of the benefits of living in a globalized age is the new openness at the Central Intelligence Agency's analytical unit. *GT 2015* allows scholars and practitioners a window on the agency's thinking about the "drivers" that will shape our new millennium. The report serves as a valuable tool for those who seek a synthesis of contemporary thinking about how life after the Cold War has changed the way the United States perceives its place in the world.

At first glance, *GT 2015* appears to underscore the complexity of international relations and thus the necessity of a coherent foreign policy for the world's only superpower. It also maintains that the United States will remain central in the year 2015 to the economic and political development of other nations. Yet although the last decade of research on conflict, poverty prevention, and the linkages between good governance and economic stability may have improved our predictive abilities for some types of events, there are global dynamics that even a power like the United States will be unable to control. U.S. security in 2015 will be more compromised by a borderless world in which transnational crime, access to weapons of mass destruction, and the turmoil arising from weak governance will be factors.

Three areas of analysis in *GT 2015* reaffirm some of the important work of the last decade: (1) governance; (2) conflict (and its impact on both First and Third World security); and (3) the limits of globalization as a salve for reducing poverty. For example, *GT 2015* notes that "most of the world's 191 states are ethnically heterogeneous,

Countries With Youth Bulges in 2000 and 2015[a]

Youth bulge
in 2000

Youth bulge
in 2000 and 2015

Latin America	Sub-Saharan Africa		Middle East	Asia/Pacific
Dominican Republic	Benin	Mali	Gaza Strip	Marshall Islands
Grenada	Botswana	Mozambique	Jordan	Solomon Islands
Haiti	Burkina Faso	Namibia	Lebanon	Tonga
Honduras	Burundi	Niger	Libya	
Nicaragua	Central African Republic	Nigeria	Iran	
	Chad	Rwanda	Iraq	
	Comoros	Sao Tome and	Saudi Arabia[b]	
	Congo, Democratic	Principe	Syria	
	Republic of the	Senegal	West Bank	
	Congo, Republic of	Sudan	Yemen	
	Cote d'Ivoire	Swaziland		
	Eritrea	Tanzania		
	Ethiopia	Togo		
	Kenya	Uganda		
	Lesotho[c]	Zambia		
	Malawi	Zimbabwe		

[a] A country is considered to have a youth bulge if the ratio of the population aged 15 to 29 to the population aged 30 to 54 exceeds 1.27.

[b] Saudi citizens only; does not include the large number of guest workers.

[c] Lesotho did not have a youth bulge in 2000.

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From NIC *Global Trends 2015*

and many contain ethnic populations with co-ethnics in neighboring states. By 2015, ethnic heterogeneity will increase in almost all states, as a result of international migration and divergent birthrates of migrant and native populations" (page 42). *GT 2015's* analysis only ratifies some of the recent economic modeling of the relationship between ethnicity and conflict, which maintains that it is less likely internal conflicts will increase in the future solely on the basis of ethnic differences (see Berdel & Malone, 2000).

The report also underscores the work that World Bank economist Paul Collier has done challenging the conventional wisdom that ethnic and religious diversity spell trouble. Indeed, as Collier notes, it is when a society is composed of only two ethnic groups that conflict is at its highest. The more ethnically diverse a state, the less

likely it is to experience a civil war. And religious diversity is even more crucial to national security: the greater the degree of religious diversity in a society, the safer it is (Collier, 1998). On this point, one need only look to the *GT 2015's* important graphic on "Worldwide Adherents of Selected Major Religions" to understand why Africa is more likely to suffer unabated conflict whereas East Asia (which has the most diverse religious mix globally) will be less explosive.

The issue of governance is one that *GT 2015* explores from several angles. Most significant is the report's emphasis on the impact that good leadership can have on a state's ability to (a) mobilize resources, (b) integrate new ideas into policy formation, and (c) allow the participation of non-state actors. As we struggle to understand more about the factors that determine

whether foreign assistance can promote economic and political development, *GT 2015* suggests that we more closely track both how recipient states are governed and what kind of leadership emerges within them. High levels of corruption or the free operation of drug cartels or terrorists will signal the inability of a state to manage its own future economic and political growth. The trends described will certainly provide a more predictive model for those seeking to support countries where a commitment already exists to put reform and institution building on the priority agenda (World Bank, 1998).[1] But the report still remains very nation-state oriented despite its predictions of increased international collaboration and the growing importance of non-state actors.

GT 2015 also notes how poverty reduction in some parts of the globe will be hampered by such factors as massive epidemic diseases (such as HIV/AIDS and tuberculosis) or ongoing conflict that inhibits basic economic growth. And the report properly highlights the ongoing exclusion of so many people in Africa and Asia from economic and political life, in part because of water shortages or a lack of infrastructure for the delivery of adequate medical or educational services. These types of obstacles demonstrate how much farther apart the First and Third world will be in fifteen years. It is precisely the paradox of exclusion from the global economy (based on physical, political, or health reasons) that suggests the dark side of globalization for those people subjected to ongoing insecurity due to internal conflict, forced migration, or disease. It also puts the United States on notice of the need to address these tremendous gaps in the quality of life in a more collaborative fashion— through the support of international organizations whose missions address poverty alleviation, global health support, and peacebuilding.

It is reassuring to note that the U.S. government has assimilated so much learning into this trends analysis. *GT 2015* sounds a potential alarm in policymaking circles that preventing deadly conflict might be as central to our national security as the building of a missile defense or investment in other high technology weaponry to ward off the perverse terrorist activities of non-state actors (Carnegie Commission, 1997). But reading this report in the current environment of U.S. withdrawal from global concerns seems ironic. U.S. leadership demands not only greater understanding of the problems that lie ahead, but also a strategy for acting upon the major threats that could prevent another Bosnia, resolve a regional war in Central Africa, or address the growing instability in the Andean region. Will this report truly sound an alarm, or will policymakers turn off the buzzer and go back to sleep? Complacency seems to be the biggest risk the United States faces in a day and age when its power remains unchallenged. **W**

ENDNOTE

[1] See, for example, World Bank (1998), which discusses the impact of governance on the ability of economic development assistance to support development.

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The USA in an Interdependent World: New Leadership through International Cooperation?

By Michael Hanssler and Arno Weinmann

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GT 2015 provides a comprehensive and carefully compiled scenario for our common future and will hopefully reach a broad international audience.

But the report's overall assumption that the United States will remain the preponderant power in the decades ahead could well be questioned. For example, will today's global power structures remain as they are once a majority of the Chinese population has access to the Internet and China further increases its wealth and expands its military influence? And might not the continuously increasing worldwide poverty gap as well as the digital divide cause at least a partial collapse of our present transnational systems, leading to the creation of fundamentally new models of global governance?

Other complicating factors abound. In the near future, developing nations may more aggressively question the traditional development model as promoted by the Bretton Woods Institutions, the WTO, and other international organizations—organizations that are already perceived by some to be acting under a regime dominated by industrialized countries. And what changes in the balance of economic and political power will we see once a well-educated and striving middle class population in India (which already today outnumbers the total population of the European Union) puts its full weight on the global scale? Such important questions are only partly covered in *GT 2015.* Again, the conclusions the authors of the NIC report take are hampered to a large extent by being based on the assumption that the United States will continue to be the major force in the world community.

By 2015, the globalization backlash may well have become a global phenomenon in our society—seriously questioning the traditional U.S. hegemony and resulting in a strong desire for new regional forms of cooperation along the principle of subsidiarity. A return to functional regionalism (as outlined in Alternative Scenario 3 of the report) seems a valid alternative and is already today being called for by many grass-roots organizations.

On specific issues: The report's assumption that the biotechnology revolution will be instrumental in feeding a growing world population appears slightly optimistic—given the present cultural and political concerns about genetic modification in Europe, India, and other regions of the world.

Regarding conflicts and natural resources: Both fields are thoroughly covered in *GT 2015,* and environmental issues also fortunately receive adequate recognition. But even more attention might have been drawn to the interdependencies and system linkages arising from a mounting regional, national, and international competition over natural resources, the access to land and water, and interrelated migration problems. What will happen if some of the Intergovernmental Panel on Climate Change (IPCC) scenarios come true and sea levels actually rise much faster than analysts had predicted but a few years ago? Will the people in Bangladesh not turn to India for refuge and shelter if their land is flooded? And what would such a crisis mean for the already precarious balance of power in South Asia? Surely the United States would be well advised to prepare for such potentially real catastrophes. Difficult as they might be to imagine, such dramatic scenarios would be a worthwhile addition to future NIC reports.

In addition, poor nations will be hit hardest by the effects of global warming, with further and considerable repercussions on the political and economic stability of large parts of Africa and Asia. Would such fundamental "socio-economic-ecologic" issues perhaps deserve even more attention in the work of the National Intelligence Council than *GT 2015* gives them?

In essence, we may well see in 2015 a world in which the United States will no longer dominate world society—regardless of whether we welcome such a development or not. It is therefore our hope that the

world's strongest economy will in the future be even more inclined to meet its international obligations—be it as a role model of democracy or as a strong and reliable advocate for the United Nations. Ⓦ

International Environmental Governance: New Roles for Governments and Nongovernmental Organizations

By Liliana Hisas

Liliana Hisas is president of Fundacion Ecologica Universal (FEU), a nongovernmental environmental organization based in Buenos Aires. She has worked for FEU since 1992.

Globalization is posing certain changes in the way governance will be shaped in the coming years. The greater and freer flows of information, capital, goods, and services (among others) are having a profound impact on global economic development, international trade, communications, labor, environment, health, and human development. There is also an unprecedented tendency toward the increased interaction of peoples, governments, and businesses across international borders.

The environmental field in particular will be affected by these trends. Access to safe water, the impacts of climate change, and the continuation of population growth will pose some of the major global challenges over the next 15 years. To respond to these challenges, the world will have to face the importance of effective environmental governance. Governance will have a decisive impact on trade and health as well as environmental decision-making. Therefore, the nongovernmental environmental community welcomes the initiative of the United States National Intelligence Council to include environmental issues in its *GT 2015*

report.

The results of a recent United Nations Development Programme study suggest that many of the major environmental problems in the next century are problems that exist now but that are not receiving enough policy attention. But how can these problems be effectively addressed? The key is not to label governments as *them* and NGOs as *us.* Instead, both cultures should work together as *us,* towards a safer and more balanced environment. In some developing countries, both governments and NGOs see each other as competitors or adversaries instead of strategic allies. Only by working together as partners can the effective environmental governance that the global environment requires be achieved.

Here is a review of the actors essential for effective environmental governance:

· *Governments*: The design, implementation, and enforcement of environmental policies are the responsibilities of governments. But in today's world (where globalization is expanding so quickly and

national economies are a priority), most government environmental agencies do not or cannot act more strongly. Governments' priorities are limited, especially in the developing world, to defending the interest of their own economic situations, of their labor forces, and of their own natural resources.

· *Nongovernmental Organizations:* NGOs define a large and diverse number of entities, ranging from solidly-structured and organized international groups to smaller but effective self-financed groups, research academic entities, "government" non-governmental organizations, and single-person organizations. The effectiveness of the environmental NGO community is based on the following factors: expertise, knowledge, research, close contact with people at the local level, and capacity to network with other organizations. In most cases, NGOs have developed a more solid capacity than governments to deal with (for example) global environmental conventions, as these groups have been following up the international negotiations since their inception.

· *Private Sector.* The for-profit component represents the motor of most economies in both the developed and developing world. Compliance with environmental standards is perceived not to be an option for many developing-world companies, which fear losing their competitiveness.

New Roles for Effective Global Environmental Governance

Until there is an honest, open, and fruitful dialogue between these actors, most efforts towards effective global environmental governance are fated to fail. This tendency will be worsened by the quick pace of globalization.

By 2015, the new roles for effective global environmental governance will have several requirements:

· *Governments* will have to confront demands from NGOs and more organized and informed individuals for greater participation and the right to live under better conditions. However, the majority of governments will continue to resist engaging with nongovernmental actors. Some governments (especially in developing countries) will have to overcome certain misperceptions and prejudices regarding dialogue and engagement with civil society. Some of these misperceptions and prejudices include (a) the idea of NGOs having more financial resources than governments, or (b) that governments are unique sources of environmental knowledge and

actions. These are particularly clear in the government-NGO relationship in the developing world. Governments will also realize that *not* complying with global environmental commitments will bring major negative consequences at the national level. In the area of international trade, some of the consequences of this noncompliance are already visible, and in a globalized world are devastating for the environment. In Indonesia and Malaysia, to cite just one example, the price for entering the global market has been rapid deforestation.

· *The private sector's* commitment to environmental governance will depend on the demands that governments and civil society place on it as well as its compliance with trade agreements. One of the key questions, then, is if companies are ready to convert their production processes to much cleaner ones.

· *NGOs* could become the major driving force of this new equation. For that, NGOs will have to organize and articulate their pro-environment messages better, and the alliances among Northern and Southern NGO networks will have to increase in number and strength. Strategic alliances with the media will be crucial. Empowerment of people through information will certainly challenge the authority of most governments, as a more-informed and better-coordinated civil society will demand more from both governments and for-profit companies.

The critical point for changing these interrelationships will be marked by the World Summit on Sustainable Development (the Earth Summit II), to be held in Johannesburg, South Africa in September 2002. This Summit will review the ten-year period from the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil in 1992. Not much has happened since the first Rio conference regarding compliance with international environmental agreements. The Convention on Climate Change, for instance, is a clear example of how national interests are much more important to most governments than global commitments. The frustration most NGOs are accumulating by the lack of commitment, enforcement, and engagement with governments will be made clear at this Summit, where confrontations will be inevitable. The positive side of this critical period is that, after Earth Summit II, governments, NGOs and the private sector will have a chance to start the process of moving towards more effective governance in order to achieve reliable commitments and actions towards the environment.

Natural Resources and Environment: Blind Spots in *GT 2015*

By Leslie Johnston

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From a national security perspective, *GT 2015* identifies seven global drivers considered key in defining the international security environment in the coming years. It was very encouraging to see that one of the global drivers identified is "natural resources and environment." However, given the unique opportunity to highlight the relationship between the environment and security, this section of the report failed to develop this linkage in the following three aspects:

· Absence of criteria used for selecting the specific environment issues,
· Inadequate analysis presented for the conclusions reached, and
· Dissociation of the interdependency of the environmental issues discussed.

Due to space constraints, this commentary can only briefly address each of these three aspects and provide a suggested course of action for future NIC work in this area.

Some Blind Spots

First, with respect to the absence of selection criteria, it is not obvious why *GT 2015* primarily focused on: (a) food (grain production only); (b) energy (fossil fuel availability); and (c) water, in light of the overwhelming decline of the global environment and its potential impact on human livelihoods and security. A number of reports issued in 2000 and 2001 have painted a very different picture of the future environment than *GT 2015,* which states that "the pressures on the environment as a result of economic growth will decrease as a result of less energy-intensive economic development and technological advances" (page 31). But in contrast to this conclusion, the current global patterns of production, consumption, climate change, and agricultural expansion raise serious concerns about the present and future capacity of the Earth's natural resource base to sustain a growing population. For example, the World Wildlife Fund's *Living Planet Report* (2000) has estimated that the Earth's ecosystems and renewable natural resources have declined 33 percent over the past 30 years, while demands on these ecosystems have increased by 50 percent. The conclusions reached by *GT 2015* appear to depend heavily on technological advances—but the authors do not acknowledge that, even with such advances, many functions and services provided by ecosystems cannot be substituted with technological fixes.

The *GT 2015* treatment of natural resources and environment also does not provide its readers with enough information to evaluate the validity or the process by which its conclusions were obtained. For example, the section on food states that "world food grain production and stocks will be adequate to meet the needs of a growing world population" (page 26). This conclusion is presented without reference to the critical issues facing agriculture, such as (a) soil degradation, which is a concern for as much as 65 percent of the world's agricultural land (World Resources, 2000, page 62) or (b) that the food supply for 480 million people is currently being produced with the unsustainable use of water (Brown, 2000). Another recent study has highlighted the impact of expanding agricultural production to meet world demands as a major driver of global environmental change. Its authors argue that such an expansion would be accompanied by unprecedented "eutrophication of terrestrial, freshwater, and near-shore marine ecosystems"—subsequently compromising their productivity, contribution to food security, and associated ecosystem functions (Tilman et al., 2001).

The Omission of Fisheries

Another glaring omission in the "natural resources and environment" section of *GT 2015* is the lack of any discussion on the impact of declining fisheries as related to food security and general environmental trends. This omission is critical given that, as a food source, fish provided 16.5 percent of the total animal protein for human consumption in 1997 (World Resources 2000, page 79).

Approximately one billion people (predominately in Asia and coastal developing countries) rely on fish as their primary source of animal protein. The latest reports on

the status of the world's fisheries is that the annual global catch of wild fish is leveling off at just under 90 metric tons (Engelman et al., 2000). Eleven of the world's 15 major ocean fishing areas and more than two-thirds of ocean fish species are in decline. The FAO 1999 report states that the world's fishers are fully exploiting 44 percent of fish stocks and overfishing another 16 percent (FAO, 1999). This statistic is not surprising, since the number of fishers has more than doubled between 1970 and 1990 while the number of fish caught per fisher declined by an average of 30 percent (Engelman et al., 2000). Although commercial aquaculture is making up some of

livelihoods cannot compete with foreign-owned large-scale trawlers and developed-country markets. And as a greater share of fish is exported for foreign exchange and profits, the net supply of fish in developing countries for domestic consumption declines. For example, off Africa's Atlantic coast, increased fishing by commercial trawlers has caused fish resources to drop by more than half from 1985 to 1990 (World Resources, 1998, page 196). In developed countries, citizens have the luxury of either buying the types of fish they prefer to eat or switching to another protein source. But if fisheries collapse in countries in which people depend on fish as a

> The authors of *GT 2015* demonstrate a fundamental lack of understanding of the interdependency of natural resources within the environment.
> ⸺Leslie Johnston, USAID

the difference, these products are primarily destined for developed-country consumers and impose substantial environmental costs on developing countries. These costs include (a) loss of coastal ecosystems, (b) increased demand on wild fish harvests as food supply for farmed carnivorous fish species, and (c) exacerbating demands on available water resources for human consumption and agriculture (McGinn, 1998).

What is even more troubling is the fact that humans are now fishing down the food chain: the composition of caught fish is shifting from high trophic level, piscivorous fish toward low trophic level, planktivorous pelagic fish and invertebrates (Pauly et al., 1998). This shift in species composition, relative abundance, and predator-prey relationships is changing the marine community. Thus, we are altering the entire ecological balance of the ocean with unknown consequences.

Finally, continued deterioration of coastal ecosystems (such as coral reefs and mangroves) and the fish stocks they support could have serious implications for future access to protein resources and employment security in developing countries.

While potential conflicts over water resources merit extensive discussion, limited attention has been paid to the tensions surrounding fisheries activities. But the potential for heightened tensions and increased conflicts rise as stocks decline, demand increases, trawlers venture farther from home, and other economic industries (such as offshore oil and gas drilling) impact the resource. As an economic resource, fishing provides jobs for over 20 million people worldwide, with 95 percent of these jobs in developing countries. Small-scale fishers and local consumers dependent upon fishing for their food and

major part of their diet and income, the potential for conflict will be dramatically heightened.

Such conflicts between developed countries range from the 1970s "Cod Wars" between Britain and Iceland to the 1996 incident of a Canadian patrol boat commandeering and impounding a Spanish fishing vessel in pursuance of the Canadian Coastal Fisheries Protection Act. Increased tensions have also arisen between developed countries and developing countries over fisheries. In 1990, Namibian government officials boarded five Spanish supertrawlers that were illegally fishing in the Namibian Exclusive Economic Zone waters (Fairlie, 1999). The court case that ensued resulted in the confiscation of the Spanish vessels and an imposition of 1.65 million rand (U.S. $206,327) in fines upon the ships' captains. Less well-known but no less significant are those disputes that have occurred between commercial offshore trawling fleets and inshore fishers from developing countries (Fairlie, 1999). There have also been heightened tensions and conflicts reported among fishers within a country. Finally, it should be noted that these issues are not limited to marine fisheries. In India, for example, violence has erupted between the National Fisherworkers' Forum and the commercial prawn farms on the largest fresh water lake in Asia, Chilika Lake (Noronha, 1999).

Climate Change

It is also disturbing that, in light of the scientific evidence, climate change is only briefly mentioned in *GT 2015* and was not specifically tied to its potential impact on security issues. Research is increasingly linking climate change to shifts in distribution patterns of wild species as well as their reproductive success, population

abundance, and shifts in predator-prey relationships. All of these will ultimately impact ecosystem functions and services (Wuethrich, 2000).

For example, rising sea surface temperatures (driven by climate change) are accepted by the scientific community as the primary cause of the unprecedented global coral bleaching events. The mass coral bleaching and mortality events of 1998 were the most geographically widespread and severe that have ever been recorded. As the reef structure degrades with subsequent bleaching events, the coral reef ecosystem function and productivity will be impacted. Yet *GT 2015* fails to mention this important issue. And equally disconcerting is the report's lack of discussion on the environmental and political ramifications that increased oil and gas extraction will have in many developing countries. For example, *GT 2015* states that Latin America "has more than 117 billion barrels of proven oil reserves and potentially 114 billion barrels of undiscovered oil" (page 30). But one needs to analyze the *cost* of extraction in these environmentally and politically sensitive areas (Bowles et al., 1998). Offshore drilling for oil (and associated activities that threaten rich spawning grounds) can also present potential conflicts compounded by already declining fisheries (McGinn, 1999).

Natural Resources and the Environment

Finally, by dividing the report's environment section into two parts (natural resources and environment), the authors of *GT 2015* demonstrate a fundamental lack of understanding of the interdependency of natural resources within the environment. This type of treatment does a disservice to the importance environmental issues will play in the future. For example, although the report's water section discusses the issue of water usage and food production, the authors make no connection between the two sections (such as the implications of decreased water availability on grain production).

The loss of biodiversity via deforestation is another example of this environment/natural resource interdependence that is only briefly mentioned in the report—but without any reference to how this loss could potentially impact not only food security, but also water quality and quantity. A little-recognized fact about the interrelationship of biodiversity and food is that 72 percent of 1,330 crop species have one or more cultivars that require pollination by bees, while at least twenty genera of animals other than bees also provide pollination services to the world's most important crops. As managed bees are in decline in many parts of the world, these wild animal pollinators (which need intact habitat to survive) are assuming an increasingly critical role for the world's food supply (Nabhan and Buchmann, 1997).

Forests also regulate the volume and periodicity of water flows and serve as a water filtration system. However, deforestation disrupts the functioning of the ecosystem leading to destructive flood and drought cycles, degraded water quality, and loss of topsoil—all of which ultimately impact agricultural productivity and human livelihoods. Additionally, the effect of deforestation far inland indirectly impacts coastal resources. For example, coral reefs are among the most biologically rich and productive ecosystems, contributing about one-quarter of the total fish catch in developing countries. But sedimentation resulting from deforestation results in the smothering of corals and the reduction of filtered-light levels, ultimately impacting coral survival and production capacity of the reef ecosystem (Bryant et al., 1998).

Although *GT 2015* is a good first step towards putting these issues on the national security agenda, I would encourage the NIC to take the next step and revisit the issues and implications for international security through the lens of natural resource interdependency. As noted above, the mismanagement or overexploitation of one resource can produce cascading impacts throughout its associated resource system. **W**

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No Substitue for Real Policymaking

By Michael A. Ledeen

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Policymakers do not want broad generalizations, hedged in weasel words. They want specific analyses of real countries with real leaders. Alas, *GT 2015* gives very little specificity and (amazingly) fails to mention a single leader. Instead, it almost always describes so many possibilities that it is virtually useless for policy purposes. When the report does take a firm stand, its claims are dubious. And it is dangerously overconfident on at least one of the major policy issues facing this country.

My heart goes out to the authors, who were asked to conduct an impossible exercise. No one this side of Nostradamus can accurately forecast 15 years ahead; anyone who can get it right for the next three to five years is a genius. No wonder they hedged almost all their bets. Moreover, it is hard enough for a single skilled thinker to produce a clear, incisive analysis; if an entire committee has to sign off on it, the final product will always be muddled and diluted. *GT 2015* is better than most

collective papers (it is very well written), but it is no substitute for the real thing.

Leaders and *A*Governance@

The greatest single weakness in the report is its vacuous abstractnessCstating on page 17, for example, that *A*[a]ll trends...will be influenced...by decisions of people.@ Having said this, the authors of *GT 2015* subsequently lapse into vague references about good and bad *A*governance,@ when the policymaker needs to hear about specific leaders, and how *they* are likely to react to the various scenarios spun out in the text. One needs to hear about Putin, Arafat, Mbeke, and BlairCnot about *A*governance.@ One might argue that, since we are looking 15 years ahead, these leaders are unlikely to be in power. But the world of 2015 will depend in part on the decisions of these real people in the next few years, and the study would be much more useful if the authors had devoted some of their considerable brain power to the men and

women who compose contemporary Agovernance.@

The report=s failure to deal with real leaders leads the authors into some unfortunate euphemisms, which in turn obscure some global realities. Talking about Africa, for example, we hear that Athe potential for famine will persist in countries with repressive government policies or internal conflicts@ (page 9). In plain English, some leaders starve their opponents to death. Is it politically incorrect to say just that?

This is all part and parcel of *GT 2015's* pattern of downplaying politics at the expense of economics and Anatural forces.@ I suppose it is still fashionable to pretend that there is a social Ascience,@ but the best we can do is to try to understand specific circumstances and leaders well enough to be able to do some Aif...thens.@ This goes beyond the categories of leadership; some tyrants will do better than others in a given situation, as will some democratic leaders. Most of us thought Spain would face dramatic internal turmoil after Franco=s death, but King Juan Carlos proved a brilliant democratic leader. And Singapore=s great success is due to the enlightened despotism of Lee Kwan Yu. Again, the report states that Amost autocratic states in the Middle East and Africa will not have the institutions or cultural orientation to exploit the opportunities provided by nonstate actors...@ (page 46). But the point is that good leaders make good institutions, not the other way around. A generation ago, Africa and Asia were at a similar level of development, but good Asian leadersC in and out of governmentCcreated the institutions, and reshaped the cultural orientation of their people. Some, like Singapore and Taiwan, did it from above. Others, like South Korea, did it from below. Policymakers need to know how this was accomplishedC which models succeeded and which failed.

Tocqueville bemoaned Americans= tendency to embrace Abig ideas@ at the expense of the tough details and detailed thinking that is required to understand our real condition, and *GT 2015* suffers from this weakness in our national character. As Tocqueville commented, once you buy into a general theory, you are less inclined to work hard for an outcome that seems in conflict with the presumed general tendency. I fear that studies like *GT 2015* will make policymakers less inclined to get actively involved in supporting democratic leaders, which I believe should be a central part of our foreign policy. The report is rife with statements such as AThe interplay of demographics and diseaseC as well as poor governanceCwill be the major determinants of Africa=s increasing marginalization...Only a few countries will do better...@ (page 71). Once again, one would like to know the specifics: which are the Afew countries,@ and why will they do better? What can we do to increase the chances of other countries doing better? None of these themes are discussed.

Worse yet, there is a misguided assumption in *GT 2015* that problems are best solved by governmentsCan assumption that informs statements such as: ATo prosper in the global economy of 2015, governments will have to invest more in technology, in public education, and in broader participation in government to include increasingly influential nonstate actors@ (page 18). One might better argue that governments will have to do *less* so that free people can function better, education can improve, and private associations (from corporations to philanthropies) can function more effectively. The bulk of our experience in the past half-century suggests that government is both a major cause of the problems and a highly inefficient element in their solution.

Science

A lot of the science in *GT 2015* is dubious. Global warming, which is a questionable hypothesis based on computer modeling that leaves out several key elements in the environment, is accepted as fact in the report: AGlobal warming will challenge the international community as indications of a warming climate . . . occur@ (page 32). This confidence is misplaced; there should have been some discussion of the weakness of the hypothesis and the counterevidence pointing to global cooling. And the report=s generalizations about the greenhouse effect are also somewhat contradictory. On page 31, for example, we are first told that Agreenhouse gas emissions will increase substantially,@ and then, later on the same page, we hear that environmental pressures will decrease because new technologies will Areduce the rate of increase in the amount of pollution...@ And it seems to be assumed that nuclear energyCthe cleanest energy form of allC will not be expanded.

Similarly, *GT 2015* generalizations on medical Ascience@ are far beyond reasonable, such as its assertion that A[n]oninfectious diseases will pose greater challenges to health in developed countries than will infectious diseases@ (page 24). This assertion seems suspectCwhat with the emergence of new drug-resistant strains of infectious diseases like TB, malaria and pneumonia, and the potential for new forms of AIDS. To take one example, if AIDS mutates into a form that can be carried by aerosol or insectsCand there are some very good scientists who say this is quite possibleCthe entire picture would change.

China

Finally, there is China, perhaps the most important single foreign policy challenge to the United States. The direct threat to the United States is described by *GT 2015* in one of those euphemisms that make the document so much less useful than it should be:

Estimates of China beyond five years are fraught with unknowables...Most assessments today argue that China will seek to avoid conflict in the region to promote stable economic growth and to ensure internal stability. A strong China, others assert, would seek to adjust regional power arrangements to its advantage, risking conflict with neighbors and some powers external to the region (page 50).

That last clauseCAsome powers external to the region@Cmeans the United States. The basis for it is not some theoretical hypothesis, but the official military doctrine of the People=s Republic of China, which brands the United States an enemy, and accordingly defines China=s military mission as preparing to fight and win a war with the United States. Why is that doctrine not spelled out explicitly? The most likely answer is that the authors of the document do not believe it. They should have said so. They go on to say that Athe majority of the (Chinese military) force will not be fully modernized by 2015@ (page 53)Can incredible claim which in turn rests on the assumption that the current leaders Aapparently agree that, for the foreseeable future, such priorities as agricultural and national infrastructure modernization must take precedence over military development@ (page 54)Cand that this policy will remain in place under the next generation.

These are assumptions that drive a certain American policy, whose tenets are: don=t worry about China, don=t try to limit the exports of Western military technology, and don=t design American policy to deal with the very real possibility of armed conflict with China. The assumptions may be trueCbut there is lots of evidence that they are not, and policymakers are paid to protect the nation against worst-case scenarios. *GT 2015* embraces the most soothing scenario, even as it warns that the Chinese future cannot be predicted with any real confidence beyond five years at the most.

Thus, not only is the document generally of little use to policymakers; on occasion, indeed on what is arguably the most important foreign policy challenge we face, it is downright dangerous. **W**

ADVENTURES IN FUTUROLOGY

By Gavin Kitchingham, United Kingdom Ministry of Defence

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Predicting the future is difficult. Winston Churchill, when asked to list the desirable qualities for an aspiring politician, answered: "It is the ability to foretell what is going to happen tomorrow, next week, next month, and next year. . .and to have the ability afterwards to explain why it didn't happen."

Having recently been through an exercise at the United Kingdom Ministry of Defence (MOD) similar to *GT 2015* (which culminated in publication of the paper *The Future Strategic Context for Defence*), I can empathize with all those involved in the production of the U.S. report. Perhaps the only predictions which they (and we) can make with absolute certainty is that some people will tell us that we have got it wrong, and that some of them will be right.

Notwithstanding the difficulties, the reason that we engage in such adventures in "futurology" is a recognition that the impact of policy decisions that we take today will be felt in ten, twenty, or thirty years and beyond— particularly given the length of equipment development and acquisition programs. There is a danger that key decisions taken on the basis of the world today (or worse still, the world yesterday) will prove inappropriate to the changing security environment of the future. But can you actually pin down those changes with any degree of confidence?

Given the inherent uncertainty involved in any exercise of this nature, it is perhaps gratifying that *GT 2015* and

Strategic Context reach broadly similar judgements and conclusions in a range of areas. Certainly there are differences between the reports (particularly differences in emphasis). But over a range of issues, both identify the same key trends. A common theme is the increasing significance of environmental and resource issues as a factor with the potential to lead to tension and conflict. On technology, both papers focus on developments in the same key areas of information technology, bio-technology and nano-technology. Similar concerns are expressed in both over asymmetry and the proliferation of sophisticated military equipment. And an overarching theme informing both papers is the recognition of the lack of a "clear and overriding" threat to national security as well as the implications of this for defense and security policies.

Then again, perhaps too much common ground is not entirely a good thing. It might indicate, for example, that both sets of authors have been insufficiently radical and that our projected world of tomorrow is too similar to the world of today. Both reports, of course, seek only to predict *trends* and not to predict *specific events* (which is a particularly fruitless exercise). Some trends, of course, are particularly amenable to extrapolation from existing data; but others require a significant input of "judgement" from the authors. Where those judgements are shared by *GT 2015* and *Strategic Context*, we might ask ourselves whether this commonality simply reflects common prejudices or assumptions on the part of the reports' authors.

GT 2015 does go on to identify a number of possible "discontinuities" which might upset its base case analysis. We also considered this approach for *Strategic Context* but decided against it for two main reasons. First, the range of potential discontinuities or "shocks" is so enormous that only a fraction could be included, and the report's audience might have sought to draw from any selection unwarranted conclusions about national insecurities or preoccupations.

The second reason was that *Strategic Context* constitutes a formal element in the MOD's strategic planning process, and that we generally do not propose to plan for specific low probability shocks (beyond certain contingency planning). This characteristic also explains another difference in approach between the papers. While *GT 2015* seeks to identify those trends that are "major drivers for the shape of the world," it does not consider the implications of this analysis for policymakers. *Strategic Context* goes on to identify (at least in broad terms) the key implications of its analysis for defense; it is thus one of the key elements driving the formulation of the UK's

defense and security strategy.

GT 2015, on the other hand, perhaps enjoys slightly greater freedom to be radical by virtue of what I might describe as its "semi-detached" status. Whilst the paper is clearly a National Intelligence Council product, the preamble also makes it clear that the paper synthesizes a range of views expressed by the various specialists who contributed to its production. At points in the paper, this freedom manifests itself in a refreshing willingness to be controversial.

Strategic Context also sought to make use of nongovernmental expertise. In our case, this input was fed in at a later stage of the process by means of external review of a draft which had been produced by MOD authors, who drew on a variety of internal and external sources of data and in consultation with other UK government departments. For future iterations of the paper (which we envisage producing perhaps every four years), we are very keen to involve external experts from the earliest stages of preparation.

Both papers reflect the need to take account of a wide range of issues—and not just traditional political and military factors—to inform defense and security policymaking. Grouping such diverse material can of course be difficult, and there is a danger that any sub-divisions used will mask interrelationships between subjects. The *Strategic Context* authors chose to divide its analysis between seven "dimensions" of the international security environment: (1) *physical* (e.g. environment/resources/demography); (2) *technological*; (3) *economic*; (4) *social and cultural*; (5) *legal, moral, and ethical*; (6) *political*; and (7) *military.* It is noticeable that, of these dimensions, *GT 2015* gives least prominence to the social and legal dimensions. Regarding these, *Strategic Context* addressed issues including: (a) developments in international law; (b) access to education; (c) social attitudes; (d) domestic and international public opinion and the impact of ethical considerations; and (e) the role of the media and nongovernmental organizations. There are also, as one would expect, issues on which *GT 2015* places much greater emphasis. These include (a) the impact of globalisation, (b) developments in information technology, and (c) analysis of the Asia-Pacific Region. The section on the role of the United States, addressing issues such as the ability to harness "power" to achieve foreign policy goals, is perhaps the most interesting product of the "freedom" to which I referred earlier.

Whilst I do not propose to indulge in a lengthy comparison between the details of the papers, I would like to offer two examples of the ways in which those fishing in the same pool of data can reach rather different

conclusions. (This is the "judgement" referred to earlier in action.) *Strategic Context* identifies the disproportionately large numbers of under-30s in developing countries as a continuing contributor to instability and violence. *GT 2015,* on the other hand, stresses the slowing in population growth, and suggests that a reducing "youth bulge" will improve chances of stability. On a different subject, *GT 2015* concludes that the individual's sense of nationality will weaken only in nations that are governed inefficiently. *Strategic Context* suggests that this "denationalizing" trend will be more noticeable amongst educated "elite" groups in society, particularly perhaps in Europe.

Strategic Context was published in February 2001, partly as an attempt to raise (domestically) the level of awareness and improve the level of debate on defense and security issues. It was the first time that the MOD had published this sort of wide-ranging strategic analysis, and the response, particularly in the news media and academic community, has been broadly positive. Initial press headlines tended to sensationalise and focus on the negative—"Bleak New World" and "Apocalypse Soon"—but the substance of media coverage has been more measured. The initial flurry of interest has been succeeded by further media debate on some of the issues raised. Requests for the paper have been such as to merit a second print run.

We recognise *GT 2015* as a major contribution to the sort of wider debate that we seek to encourage on the international security environment. Indeed, the value of any futurology work is increased by being able to draw on and compare a variety of analyses that have been informed by different perspectives—national and otherwise. By this, you may have guessed that we intend to crib the best ideas from *GT 2015* to inform the next iteration of *Strategic Context.* I hope that the authors of the next *Global Trends* paper will feel free to return the compliment. **W**

GOVERNANCE AND CHANGING AGE STRUCTURES

By Gayl D. Ness

Gayl D. Ness is Professor Emeritus of Sociology at the University of Michigan. His major recent publications include Five Cities: Modelling Asian Urban Population Environment Dynamics (2000); Population and Strategies for National Sustainable Development (1997)*; and* Population Environment Dynamics: Ideas and Observations (1993)*.*

*G**T 2015* offers a comprehensive and intelligent view of major global trends and sources of both strength and instability for the next 15 years. While I do not disagree with the report's overall assessment, there are two issues which its authors might have given greater emphasis: (a) the growth of young male populations, and (b) centralized and ineffective governance in countries experiencing that growth. These dynamics seem to me to present a greater threat of violence and instability than the report envisages.

Changing Age Structures

Changing age structures will provide major sources of instability in both the more-developed and the less-developed regions of the world. For the more-developed regions, aging populations will require large immigrant streams to provide the required work force. These regions will also continue to be magnets for large waves of legal and illegal immigrants. In either case, the migrants will be coming primarily from much poorer countries with markedly different social, religious, and cultural systems.

It is doubtful that the wealthy regions will be able to accept large waves of culturally different immigrants without substantial tension (already visible in anti-immigrant right-wing movements in both Europe and North America). While these tensions may be manageable through the wealthy nations' effective governance structures, they will also severely tax these governments and their policymakers. There also remains the possibility of major *nationalistic* movements that will erode and perhaps destroy the democratic gains made in the past half-century.

LePen's movement in France and the neo-Nazi violence against Africans and Turks in Germany are troubling signs in what we would normally consider the more stable and democratic parts of Europe. The Yugoslav experience is one of the most troublesome and bloody, in part because of the long history of Balkan violence. At the same time, the more peaceful movements in Czechoslovakia and South Africa offer the prospect of another scenario. Contrasting these latter two examples with Yugoslavia suggests that leadership is a critical

variable. Václav Havel and Nelson Mandela were apparently able to chart a more peaceful and democratic course and to win followers to that cause. Slobodan Milosovic, on the other hand, had to use deep-seated Serb nationalist sentiments to hold onto power when his original ideological base collapsed. How many more Havels and Mandelas will we have in the coming decades? And how many more Milosovics?

For the less-developed regions, the problems associated with changing age structures will be more severe. In these areas, rising numbers of young people about 12 million. Already the Pakistani government is incapable of providing schools for the great majority of these young men. Its combined primary and secondary school enrollment ratio of 41 percent is even less than much-poorer Nepal (UNDP, 1998). Nor does the economy offer them much hope for jobs. There are no signs at this time that Pakistan's government or economy will improve in the near future. Militant Islamic groups now find easy recruitment among these "young without hope" populations.[2] As a result, the "jihad factories" of the Islamic militants appear now to be one of the country's

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Without schools and jobs, the rising numbers of young males in poor countries will provide demagogues with fodder for ethnic, religious, and political violence.
—Gayl D. Ness

(especially young males) will mean constantly rising demands that those countries are already incapable of meeting. Young male populations are growing in precisely those countries least capable of providing them with the education and employment that give them hope for the future. In 2000, there were an estimated 35 million young males (ages 15-19) in the world's least developed regions (mostly in sub-Saharan Africa and South Asia). By 2015, that number will be 51 million and still rising (UN, 1996).

There is a long history of scholarship noting that young males are a highly volatile population (Moller, 1966-67; Campbell, 1968; Daly & Wilson, 1988; Mesqueda & Wiener, 1999).[1] This has given rise to the notion of a "young male syndrome" that is closely associated with societal and individual violence. It is true that these youths are found at the centers of urban and ethnic riots. But it is also true that these are the same people that infantry sergeants want as recruits. Their high energy and lack of experience often gives them a sense of immortality and fearless energy. They can be mobilized for heroic, self-sacrificing and altruistic activity, but they can also be mobilized for extreme bloodletting. This implies that other conditions will affect or even determine whether or not this volatile population turns violent. Without schools and jobs, the rising numbers of young males in poor countries will provide demagogues with fodder for ethnic, religious, and political violence. Much of this will be local or regional (as in the ethnic wars of Africa), but there will also be dangerous international implications as well.

Pakistan will surely be one of the most important arenas of the resulting instability. In 2000, the estimated number of young males in Pakistan was just over 8 million (UN, 1996). By 2015, that number will rise to largest growth industries; and the future holds little hope for reductions in the resulting tensions. Given Pakistan's conflict with India over Kashmir and the increasingly central role Pakistan and Afghanistan are playing in the international Islamic terrorist movement, these tensions will not be easily contained within national or even regional boundaries.

The issue of leadership is also critical here. Young males can be mobilized to great acts of heroism and self-sacrifice *as well as* acts of brutality. The recent extreme Hutu-Tutsi violence in Rwanda, the lesser but still serious violence we see now in Kenya and Zimbabwe, and the more pervasive calm of Tanzania cannot be explained by age structures alone, since they are all very much the same in each case. Similarly, recent age structures in what were Yugoslavia and Czechoslovakia were very much the same, but the levels of violence were far different. In these cases, leadership has played a prominent role in determining whether the young male syndrome will lead to violence or more peaceful transitions.

There may also be policy lessons in these cases. Increasing economic opportunities can relieve some of the pressure on these young males and give them more hope; development may be something of a pacifier. Similarly, reducing fertility is a sure way to reduce the proportion and growth of this highly-volatile population, although it takes almost two decades for societies to feel these effects of this decline. Finally, external intervention (as in Bosnia) or the lack of it (as in Rwanda) may also play a critical role.

Governance

Four decades ago, Edward Shils (1961) pointed to a

critical issue of political development in the "new states."[3] He noted (a) that these new governments were highly centralized, (b) that this centralization produced debilitating inefficiencies and exacerbated inequalities, and (c) that centralization proved to be a self-reinforcing process. It produced a vicious cycle in which the central government kept power and resources for itself because it believed local governments lacked effective management capacities. But centralization itself deprived local governments of the experience to learn and deprived local populations of any possibility of making their governments responsible and responsive—which further reinforced the argument for centralization.

High degrees of government centralization also tend to weaken government efforts to promote social and economic development. Centralization deprives planners of important information about local conditions and obstructs the adaptation of plans to distinctive local situations. Unfortunately, those countries with the weakest and most centralized governments are also those with the high and growing numbers of young males. As they lack the capacity to provide hopeful futures for these young, the potential for violence in these countries increases.

In sum, age structures will be critical ingredients in social stability and violence over the near future. Aging in Europe will require even greater immigration than we see now, and with this migration will come pressures associated with right-wing politics. It is in the poorest countries, however, that age structures will be most problematic. There, growing numbers of young males will be living under governments incapable of providing them much hope for the future; and demagogues will be tempted to exploit this population for violent ends. Though much of that violence may be localized, it could also easily spill over national boundaries and become part of the global network of terrorism and violence. W

ENDNOTES

[1] I was first made aware of this issue by Howard Schuman, who conducted surveys of racial attitudes for the Kerner Comission in 1967-8 (Campbell, 1968). Mesqueda (1996) and Wiener (1999) use a ratio of males 15-29 to males over 30 as an index that shows a strong relationship with levels of societal violence. My use of 15-19 year olds examines what I feel to be the most volatile part of the age categories.

[2] This point is made poignantly in Burns (2001).

[3] This was a term that came into vogue in the late 1950s and early 1960s, especially after the demise of colonial systems and the rise of newly independent states in Asia and Africa at the end of World War II.

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SEARCHING FOR COMETS

By David Rejeski

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I was not sure whether I should approach the content of the recent *GT 2015* report as a gourmet (eagerly sampling a multi-course meal) or as a weary-eyed astronomer (searching for dim comets and uncharted galaxies). I chose the later approach, if only to try to find ways of building on the report and the dialogue I imagine it will stimulate.

I will take an unpopular stance, and also one that seemed underdeveloped in the report—namely, that institutions matter, especially institutions that can learn and adapt rapidly in highly-complex global systems. Recently, Peter Drucker raised the idea that the prime driver of future society will not be technology, information, or productivity, but what he terms the *managed institution* (Drucker, 1999). Institutions tend to receive little attention in the two-axis geopolitical debates that oscillate between state and non-state actors, good states and bad states, or the state versus the market. But, as Daniel Bell pointed out over a decade ago, scale is the key to maintaining political relevance in a global economy; and institutions are very scalable (Bell, 1988).

Transnational Corporations

Let us imagine for a moment the qualities that might characterize highly effective institutions over the next decades—institutions that will have to operate in not only a globally integrated economy but also in a highly fragmented polity. These qualities might include such things as global reach and intelligence gathering capability, organizational flexibility, good partnering abilities, high innovation capacity, a multicultural/cosmopolitan workforce, and the ability to attract and hold top talent. Let me suggest that the set of organizations that comes closest to this character set are neither government entities nor NGOs (who seemed to have emerged as heir apparent to state actors), but transnational corporations (TNCs).

In this regard, it is important to distinguish TNCs from the older concept of multinationals (in which companies had clear domestic and foreign units). TNCs are organized, managed, and evolve transnationally. Their management and economic boundaries have little or no relationship to national boundaries. From the perspective of most TNCs, countries are often reduced to the status of "cost centers."

Of the one hundred largest economic entities globally, about one-half are nation-states and one-half are TNCs (Cohen, 1998). That means that 130 of the 180 recognized states of the United Nations have economies smaller than the largest 50 TNCs (UNCTAD-DITE, 1996). The top 100 non-financial TNCs own over U.S. $2 trillion in assets outside their home countries, employ 40 million workers abroad, and have sales in their non-home countries of $14 trillion (over twice the volume of world trade). Many of the technology-focused TNCs have R&D budgets in excess of $1 billion dollars per year—funding that is spread through a global innovation system with interconnected research centers and labs. Collectively, these corporations control a large amount of the R&D spending—both in the United States and worldwide—on a range of potentially "game changing" technologies in the biological, information, and communication areas highlighted in the *GT 2015* report.

Ten transnational media conglomerates dominate most of the global media system, and their control will increase as communication technologies functionally merge. Even the Internet (that hacker's paradise of openness and empowerment) has been largely colonized by commercial interests. Of the one hundred most-visited Internet sites, over ninety are commercial. And access (or non-access) to large parts of the information highway is now cleverly controlled by commercial search engines (Introna & Nissenbaum, 1999).

In terms of reach and global presence, while the U.S. government has embassies and consulates in 176 countries, McDonalds has 15,000 restaurants in 171. In fact, McDonalds opens five new restaurants a day, four of them outside the borders of the United States. Hewlett-Packard (HP) has almost three times as many employees as the U.S. Department of Commerce, 54 percent of which operate outside the United States in

120 countries. HP has key research labs in the United Kingdom, France, Israel, and Japan; it has plans to open labs in China and India. And at the moment, over one-half of Dupont's sales as well as over one-third of its work force are outside of the United States.

Taken as a group, TNCs exercise enormous control over a variety of forces shaping our collective future. These include: (a) nutrition (in both developed and developing countries); (b) access to existing and evolving

capabilities and behaviors (for instance, reflexive/proactive behavior instead of reactive/prescriptive) that are rare in most government institutions but increasingly common in TNCs and NGOs. For certain tasks, networked organizations offer distinct competitive advantages. They provide the advantages of bigness while maintaining the flexibility of smallness. In many cases, networks will outperform hierarchies both at gathering and processing diffuse data in a global environment and

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> Leaving transnational corporations off the map of the emerging geopolitical landscape is like leaving the superhighway system out of the Rand McNally atlas.
> —David Rejeski, Woodrow Wilson Center

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telecommunications infrastructure; (c) global transportation and logistics; (d) the availability of news; (e) the shaping of consumer preferences and tastes; (f) the flow of currency; and (g) the provision of pharmaceuticals and health care.

My purpose is neither to vindicate nor vilify large business. Rather, it is to make the point that leaving transnational corporations off the map of the emerging geopolitical landscape is like leaving the superhighway system out of the Rand McNally atlas.

The Importance of Flexibility and Learning

The final reasons TNCs matter may seem less obvious but are equally critical and have to do with what might be termed *organizational learning capacity*. Unlike many state actors, which can survive with outmoded mindsets, aging workforces, and crippled budgets, global corporations are under continual pressure to challenge and change their legacy systems and operating assumptions. They must connect to the outside world and use evolving and often uncertain knowledge of their operating environment "to do better" (Axelrod & Cohen, 1999). If Václav Havel is right that the "idol of state sovereignty must inevitably dissolve," it may because statist institutions either fail to learn or learn at a slower rate than other entities vying for geopolitical power (Havel, 1999).

Successfully managed institutions in the future will be institutions that can (a) manage change and (b) recognize, shape, and operate in both networks as well as within traditional hierarchical structures and markets (Powell, 1990). That will require a set of organizational

at locating innovation and talent. Highly-networked organizations may be better at playing what Robert Putnam called the "two-level game" of international and domestic policy that is orchestrated above and below the level of the nation-state, in which operations on the international and domestic levels cannot be entirely separated and in fact impact one another (Putnam, 1988). Some TNCs such as Sony have adapted overt strategies of *global localization*—of building globalized, networked operations that are highly sensitive to local politics, culture, and economic constraints or opportunities.

GT 2015 maintains that governance matters, stating that "[s]haping the complex, fast moving world of 2015 will require reshaping traditional government structures" (page 11). It is hard to argue with the statement, but how often does this happen in reality? And are we really prepared to move in that direction? As former Commerce Secretary William Daley recently commented: "To achieve results, the federal government needs to be reorganized. What business in American hasn't reorganized itself in the past 50 years?" (Daley, 2001).

Luckily, 2015 is still a long way off. By 2015, we will have completed what some have termed the "second industrial revolution," based on new production technologies, business and organizational models, and logistics systems (Agrawal & Cohen, 2000). By then, we will have probably increased computing power by a factor of one thousand. And perhaps by then we will also have designed governance structures and institutions that can deal with the complex and dynamic world *GT 2015* describes in such great detail. **W**

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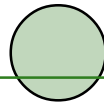
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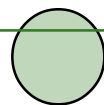
New Actors and the Dynamics of International Politics

By Ervin J. Rokke

Ervin J. Rokke is President of Moravian College in Bethlehem, Pennsylvania and an Emeritus Professor of Political Science at the U.S. Air Force Academy. His 35-year military career included assignments to the Academy faculty as well as Air Force Assistant Chief of Staff/Intelligence; as Director of Intelligence at Headquarters, European Command; and as Defense Attache to the Soviet Union. He retired at the rank of lieutenant general in 1997.

GT 2015 is an impressive effort (a) to identify major determinants in international politics, (b) to set forth the uncertain future that they portend, and (c) to uncover some corresponding propositions relevant to the policymaker. Its virtue stems not from confident prognosis but rather from the recognition that international politics lies in the hands of "drivers" which relate to one another in unpredictable fashion. Our basic predicament is complex; *GT 2015* teases from this complexity a series of propositions that are at once modest and useful.

Old and New Questions

In part, the authors of *GT 2015* approach their task with a traditional framework for analyzing international politics. The classic questions concerning the identity of the major actors, their capabilities, and their intentions regarding one another remain by implication. The report characterizes the post-1989 period in terms strikingly like those appropriate to the traumatic events following 1789, 1815, 1870, 1919, and 1945. As in previous periods of revolutionary change, the current world emerges as a period of turmoil for which a steady state remains elusive.

The more important question for *GT 2015*, however, has to do with the nature and intensity of interaction among a new assortment of actors on the world stage. By highlighting demographics, natural resources and environment, science and technology, globalization, and future conflict, the authors have substituted a series of dynamic variables for the conventional factors of form and substance (e.g., man, state, international system) (Waltz, 1959). The center of balance, if you will, has shifted from the actors themselves toward the dynamics of their interactions. For intelligence community analysts, this is a welcome (if overdue) transformation.

Non-linearity

By focusing on the dynamics of international politics, *GT 2015* concentrates on the current global tendency toward havoc instead of presenting conventional analyses of what are usually considered the historically predictable outcomes of nation-state interactions. *GT 2015* recognizes that not only have the types of global actors themselves expanded to include a whole assortment of non-state players, but that the interactions of these actors have exploded both in velocity and intensity, spilling across traditional geographic boundaries in ways that defy projection. Just as with modern Grand Prix accidents (which seldom involve only one racecar), the entire world stage is today victimized by seemingly localized entanglements and their resulting mayhem.

In all of this, *GT 2015* recognizes non-linearity as a key feature of our time. As science and technology along with other "drivers" complicate and dramatically accelerate the interactions among world players, they also drive nails into the coffin of international predictability. The authors are right both in steering clear of crisp, detailed projections and in presenting a synopsis of possible "significant discontinuities." Even so, readers looking for where *GT 2015* is most likely to err should look first for what the authors acknowledge to be an "informed extrapolation of existing trends" (page 5).

Imperatives for Security Policy

Can this report's modest but realistic projection for the next 15 years provide useful parameters for policy? Yes, indeed. One important example of this usefulness relates to the nature of our security structures, both national and international. *GT 2015* clearly supports political scientist Jim Rosenau's contention that the challenge of maintaining international security has bifurcated, with the two emerging masters being (a) traditional state interaction and (b) far more complex multicentricity (Rosenau, 1997). In recognizing that international and regional security organizations like the United Nations and NATO were designed to deal primarily with nation-states, *GT 2015* sets forth the very real challenge to stability associated with the likes of Kurds, Serbs, Hutus, and Shiites as well as other non-state actors like terrorists and organized crime. "Effective governance" is what the authors' demand, and properly so (pages 27-33).

GT 2015 sets forth even more demanding challenges

for American security policy and military force structure. Arguably, these challenges are the salient feature of the study. Among major players, it posits China, Russia, Japan, and India as worthy of particular attention; actions these countries take will be vital to traditional power relationships in key regions. Though *GT 2015* does not forecast the actions of these key players with precision, it does make clear that the United States will retain a major role in maintaining an acceptable balance of power in each of their associated regions. The components of this power are both conventional and nuclear; it therefore is unlikely that the United States can avoid responding with at least some level of force in kind. This, I would submit, is the "traditional" military imperative contained in the report.

However, traditional notions of military power do not enjoy center stage in *GT 2015*. Instead, it portrays the "drivers" behind the evolving relationships among the major powers in increasingly economic, demographic, and resource terms. Non-military drivers are particularly salient in traditional areas of regional concern such as South Asia, Sub-Saharan Africa, and Latin America. *GT 2015* authors also point out quite properly that a host of new non-state players are emerging—including transnational religious institutions, international nonprofit (and profit!) organizations, international crime syndicates and drug traffickers, foreign mercenaries, and international terrorists. These represent the "non-traditional" imperatives for American policy.

And so it is that *GT 2015* sets forth parameters for military force structure as well as security policy in a broader sense. The careful reader can only be concerned that the response of the American defense establishment to these challenges remains focused on the traditional dimensions of those challenges. The so-called "Revolution in Military Affairs" (which represents the central theme of ongoing dialogues about American security policy) largely relates to making our military establishment more efficient and effective on the battlefield by using information-age technology as well as associated organizational and procedural improvements (Owens, 2000). These are worthy enterprises that, if implemented, can improve the military's capacity for meeting traditional challenges and even expand, at the margin, its utility for such non-traditional tasks as peacekeeping and disaster relief.

But *GT 2015* makes clear that a wide variety of non-traditional challenges also are encompassed within our security predicament. No amount of improved technology applied to weapons systems in a linear fashion (or, for that matter, a "leapfrog" fashion) can resolve the complex issues emerging in the post-industrial age. Even Clausewitz saw war as a "remarkable trinity" revolving about people, the state, and the field of battle (Beyerchen, 1997). For him, the result was one of disproportionate effects and unpredictability. *GT 2015,* like Clausewitz, foresees a security situation increasingly sensitive to initial conditions. These include AIDS, natural resources, food, environment, science, and technology—all of which our security strategies have tended to overlook.

Conclusion

GT 2015 calls for a comprehensive approach to international stability and security that effectively integrates American policy across the spectrum of demographic, ecological, scientific, and economic as well as military drivers. Students of the "new sciences" would argue that such an integrated approach is the only proper response to a security predicament that has evolved into a complex adaptive system with worldwide tentacles. This truly is a new world in which the application of explosive force, however agile, is no longer sufficient to serve either American or broader security objectives. *GT 2015's* modest approach to predicting the future sets forth a very ambitious prescription for policy, indeed. **W**

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China, Climate Change, and Biases in *GT 2015*

By Judith Shapiro

Judith Shapiro teaches environmental politics at American University. Her new book, Mao=s War Against Nature: Politics and the Environment in Revolutionary China, *is published by Cambridge University Press. Her other books on China, (written with Liang Heng), include* Son of the Revolution *(Knopf, 1983) and* After the Nightmare *(Knopf, 1987).*

On the whole, China-watchers=forecasting record has been poorCfew anticipated the post-Mao economic reforms, and even fewer the Tiananmen massacre. Wisely, then, *GT 2015* underlines China=s unpredictability. The report shies away from projections about a country whose rapid transformation is complicated by globalization, a values crisis, the fragility of the Communist Party=s legitimacy, and an imperfect conversion from a command-driven economic system to a Amarket socialism@ fraught with corruption.

China-watchers tend toward extremesCsome fearing a strong China, others a weak one. Like Goldilocks, the China-watchers consulted for *GT 2015* seem to want a China that is Ajust right,@ neither aggressively expansionist nor collapsing into chaos. Had the report=s space permitted, the authors might have expounded upon the relationship between China=s domestic uncertainties and its international behavior. There is great potential for internal unrest in China due to displacements of workers and peasants, the increasing scarcity of fundamental resources like water, and ethnic tensions tied to human rights violations. Governance issues are paramount. As with globalization-influenced transformations elsewhere, the gap in China is widening between the Awinners@ (who include entrepreneurs, those able to learn new skills, and those able to profit by their connections to the old establishment) and the Alosers@ (who include former workers in money-losing state-run factories and farmers struggling under heavy tax burdens). If the World Trade Organization=s (WTO) proposed agricultural import liberalizations come through, these farmers could be devastated. *GT 2015* assumes that China=s entry into the WTO will proceed on schedule, although (as of this writing), China appears wisely to have reconsidered some of its commitments. These domestic issues will affect the choices China makes in the international arena.

Environmental Assumptions

The report=s China sections seem to downplay the importance of environmental issues, as does *GT 2015* as a whole. While the study mentions Northern China=s falling water tables and the great South-North water transfer scheme (a megaproject with staggering ecological ramifications), its discussion of China=s critical impact on the global environment is limited, perhaps for space reasons. It is worth noting, for example, that China has become one of the world=s major traders in imperiled wildlife (as China=s middle class develops its taste in bushmeat and coral reef fish); or that the country is now driving deforestation in Southeast Asia, as it seeks to curb the floods associated with logging on the upper reaches of its own rivers. And most importantly, China=s will be the major carbon producer of the next decades, a fact that will have even more impact upon the world by 2015 than it does today.

Indeed, one of the most striking flaws in *GT 2015* is its head-in-the-sand approach toward climate change. Seemingly disregarding the implications of its own forecasts both that (a) energy demand will increase by 50 percent over the next 15 years (page 28) and (b) that energy supplies will be adequate to meet that demand, the report then asserts (without apparent foundation) that Apressures on the environment as a result of growth will decrease as a result of less energy-intensive development@(page 31). *GT 2015* fails adequately to take into account the high costs of fossil fuel dependence in terms of climate-change induced Anatural@ disasters, coastal flooding, droughts, environmental refugees, spread of tropical disease spread, and heightened global tensions over resources. While the report foresees Ameltbacks of polar ice, sea level rise, and increasing frequency of major storms,@ it appears to downplay the implications of these phenomena by predicting Aincremental progress in reducing the growth of greenhouse gas emissions@ (page 32). (AProgress in reducing growth@ is a slippery phrase, often favored for putting positive spins on dire situations.)

And in a final box on possible Adiscontinuities,@ *GT 2015* mentions that, while global climate change may cause widespread natural disasters, its predicted scenario is of Aan enduring global consensus on the need for concerted action on…the environment@ (page 82). Unfortunately, while global climate change is real and such disasters are already occurring, such consensus has eluded the world,

Mao's War Against Nature: Politics and the Environment in Revolutionary China

By
Judith Shapiro
Cambridge: Cambridge University Press, 2001

"*In an illuminating and absorbing account, Judith Shapiro reveals how Mao's policies resulted in such massive environmental degradation that it clouds China's future despite current conservation efforts. Even today, countries often seem to subscribe to Mao's dictum, 'Man Must Conquer Nature.' China's mistakes offer important lessons for everyone, as this timely book so lucidly describes.*"

-George B. Schaller, Wildlife Conservation Society; author of *The Last Panda*
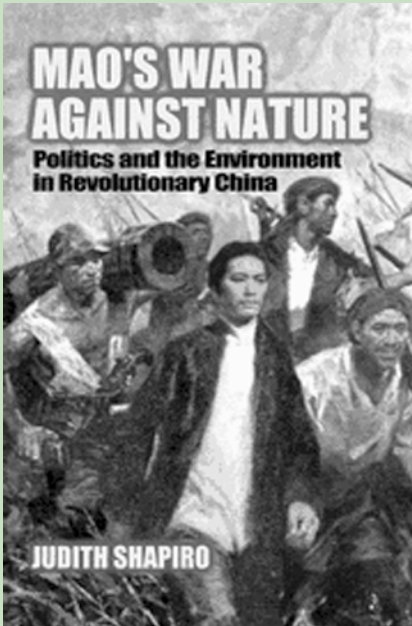
In clear and compelling prose, Judith Shapiro relates the great, untold story of the devastating impact of Chinese politics on China's environment during the Mao years. Maoist China provides an example of extreme human interference in the natural world in an era in which human relationships were also unusually distorted.

Under Mao, the traditional Chinese ideal of "harmony between heaven and humans" was abrogated in favor of Mao's insistence that "Man Must Conquer Nature." Mao and the Chinese Communist Party's "war" to bend the physical world to human will often had disastrous consequences both for human beings and the natural environment. *Mao's War Against Nature* argues that the abuse of people and the abuse of nature are often linked. Shapiro's account, told in part through the voices of average Chinese citizens and officials who lived through and participated in some of the most destructive campaigns, is both eye opening and heartbreaking.

Judith Shapiro teaches environmental politics at American University

with the United States as the major spoiler. Late as it is today for governments to curb human activity that is disrupting the planet=s infrastructure, by 2015 it will be far more difficult to mitigate these negative impacts.

Other Concerns

Others will undoubtedly write about *GT 2015's* bias in favor of biotechnology, trade liberalization, and multinational corporations. (For example, on page 40, the report sanguinely describes the business sector as growing rapidly, Aspearheading legal and judicial reform and challenging governments to become more transparent and predictable.@ Would that the link between corporate interests and good governance were so clear.) I will merely note that those concerned about the negative impacts of trade liberalization are unfairly characterized as Aspecial

interest groups@ (page 34).

Some of *GT 2015's* the report=s other questionable assumptions are as follows:

$ The introduction explains that the authors considered the drivers of demography and natural resources to be Anatural phenomena@ about which projections could be made with confidence, unlike other drivers which the authors understood as to be Acontingent on decisions that societies and governments will make.@ (page 6). But population growth and resource use are not predetermined and are in fact highly political choices made by human beings. To imply otherwise minimizes human responsibility for variables that will greatly affect how the world will look in 2015.

$ It is also worth noting *GT 2015*'s unexamined assumption that economic growth is positive. The report represents potential brakes to growth as Achallenges.@ But the key challenges the world may face by 2015 may instead lie in the *impacts* of such economic activity upon the earth=s natural systems. Economic slowdowns can be positive opportunities to: (a) revisit values about the nature of human development; (b) redefine such development in terms less costly for the natural world and for future generations; and (c) reconfigure economies so that prosperity is based less upon extractive manufacturing and more upon services, non-invasive activities, and clean-up.

$ As a final note on the report=s treatment of environmental issues, one might single out its curious but undeveloped prediction about the possibility that environmental values may fuel a new spiritual/religious movement (page 42). While this scenario is certainly conceivable, this prediction may reflect a tendency upon the part of *GT 2015's* authors to dismiss environmental concerns as based upon faith rather than as founded upon good science. **W**

MAKING THE MIGRATION TO 2015

By Michael J. White

Michael White is Professor of Sociology and Faculty Associate at the Population Studies and Training Center, Brown University. This spring, he was also a Fellow at the Woodrow Wilson Center. White's demographic interests span several aspects of population distribution. He is presently investigating the impact of urbanization for environmental quality in developing countries.

It is noteworthy that *GT 2015* lists Ademographics@ as the first of seven Akey drivers@ its authors and consultants believe will shape the world in 2015. This is a rather prominent position for demography, one that it has not always enjoyed in previous reflections on global security. Below, I offer a few thoughts about where this driver is taking us. I particularly want to react to the prediction that *GT 2015* makes on the redistribution of world population, both within and among nations.

The report notes the broad sweep regarding demographic changes: (a) most growth occurring in developing countries; (b) a substantial shift to urban areas; and (c) realignment in age structure. Demography is a pointillist canvass. From afar, one gets the image. As one gets closer to the canvas, it becomes harder to see the picture. The broad demographic trends that *GT 2015* predicts are quite likely to occur. But how they will emerge in specific countries or cities is more difficult to discern.

Accuracy of Projection

The NIC is to be commended for not projecting too far in the future. While predicting the state of the world economy or strategic alliances far into the future would be widely described as a fool=s errand, projection of population trends of even more than a decade or two also has little to recommend it. Although the mathematics of such a Awhat if@ exercise is fixed, the utility of these projections declines appreciably with time.

The report=s authors and consultants have instead employed reasonable mid-range projections of population and its composition for the upcoming decade or so. So we can probably feel fairly confident in *GT 2015's* assessments about the relative growth and distribution of the population across the world=s regions over the next few years. It is a safe bet that (current) developing countries will hold a larger share of world population; that urbanization will continue, and that there will be some continued international migration toward the highly industrialized countries.

Megacities and Urbanization

The world is about half urban now, and urbanization will be a continuing feature of the new century. *GT 2015* writes of the Aexplosive growth of cities in developing countries@ (page 20), but it is important to keep this manifestation of urbanization in perspective. While it is easy to cast the city as the villain or alternatively the savior (White, 1996), it is also worth recalling that the seminal book *The Exploding Metropolis* (Fortune, 1976) was written about New York City in the 1950s! In fact, issues of rates of growth, expansion into the hinterland, and governability all appear in the discussion of New York urbanization of a half-century ago. Today, of course, New York survives as a world cityCa status dozens of other cities are coming to share. Natural increase and urbanization have combined to make cities grow,

especially in the developing world. We live at a greater urban scale than 50 or 100 years ago.

Whereas in 1950 the world counted only one urban agglomeration over 10 million, the most recent UN count puts that number at 19. What do we know about this urbanization? Yes, it is true that megacities are bigCand very visible on the world stage. But it is important not to let the very scale and notoriety of megacities sway the urban perception out of balance altogether. The UN also estimates that these 19 cities of 10 million plus inhabitants contain 9.2 percent of the world=s urban populationCthus only about 5 percent of the world=s

environmental problems that accompany development and urbanization. The report mentions air and water quality problems in Mexico City, Sao Paulo, Lagos, and Beijing. The pressure to convert land to agricultural, industrial, and residential use is seen in Brazil=s Amazon forest, in Thailand, and in Malaysia, and in cities along the West African Coast. Tianjin, China=s third largest city, has developed a Special Economic Zone reaching out from the city into the lowlands near the sea.

But urbanization can also help sow the seeds of environmental improvementCan urban greening, if you will. Urbanization will bring more people into proximity,

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The broad demographic trends that **GT 2015** *predicts are quite likely to occur. But how they will emerge in specific countries or cities is more difficult to discern.*
—Michael J. White, Brown University

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total population. Ninety-five percent of the world=s inhabitants live in more modest cities or in the countryside. It is worth remembering that large and medium size cities will most likely still be players in global economic development over the next several decades. They, too, will face (albeit on a smaller scale) the same issues as megacities: age structure, environmental quality, job generation, and public service provision.

The notion of exploding cities often carries with it the idea that something is amiss. The growth of urban squatter settlements, apparently populated with migrants from the countryside, reinforces this perception. In most cases of urban in-migration, however, migrants (whether historical or contemporary) are generally acting in their own interest. Most move to cities to better their lives. And in the early phases of their life histories, cities grow quickly from such migration as well as natural increase. Los Angeles, for instance, grew at about 8 percent annually between 1900 and 1930. New York City about doubled during this time. In some high fertility countries today, urban growth is being fed predominantly by natural increase. We will continue to hear reports from around the world (particularly from sub-Saharan Africa) of Arapid@ urban growth. But as birth rates fall and the urban transformation sets in, these rapid city growth rates will themselves decline.

Environmental Impact

The environmental challenges of increased urbanization are real, and *GT 2015* rightly notes that developing countries will face some of the intensified

and since local urban residents do care about the quality of the local environment, pressure will build to clean up. Improvements in living standards will also increase the appetite for cleaner environments, since these living standards may translate into pressure on the public sector to act. Efficacy, however, rests on the capacity of responsive city, provincial, and national governments to allocate resources among the many good causes that come calling.

Urbanization can also aid in the development of another favorable path for the environment. Much anxiety about worldwide environmental deteriorationC particularly prospective damage in developing countriesCis linked to fertility. Urbanization is closely linked to reductions in fertility. Throughout the developing world, urban fertility is generally proceeding at about two to three children per woman below that for rural fertility (Macro International, 2001). For instance, women in urban Senegal are bearing an average of 4.3 children, whereas rural Senegalese women are bearing 6.7. Over the last five years, urban fertility in Senegal has declined nearly one child per woman, while rural fertility has remained unchanged. While the urban-rural gap is attributable to a number of factors, dynamics such as (a) increased levels of living in urban areas, (b) education and labor force shifts, and (c) the transmission of information about health and family planning are likely to be playing a role. Again, *GT 2015* is on target when it sees a salutary side to urbanization: AUrbanization will provide many countries the opportunity to tap the information revolution. . .@ (page 20).

International Migration

The world=s population will continue to shift across national boundaries in the early 21st century. As *GT 2015* argues, high-income countries will receive the largest portion of this labor flow. Despite the controversy such migration will undoubtedly engender, these population shifts are likely to be a net economic benefit to the receiving countriesCas they most likely have been for the United States (Smith and Edmonston, 1997). Again, this dynamic should be seen in historical context: while the absolute numbers of international migrants are large and increasing, the relative numbers are not necessarily out of historical scale.

So what will differ demographically in 2015? And what will be the challenge? Certainly, the international redistribution of persons will take place under tighter geo-political scrutiny than before. A simple indicator is the very fact that we now classify some long-distance migrants as Aillegal@ or Aunauthorized.@ One needs a highly developed state apparatus to be able to identify, count, and expel (or welcome) such individuals. The problem of refugees and internally displaced personsCwhich the UN now numbers over 20 millionCwill only continue to grow (UNHCR, 1999).

International labor migration will severely challenge some receiving states. Despite compelling arguments that such migrants help promote economic growth (and in some countries offset outright population decline), international migration presents difficult social policy terrain. In almost all receiving states there is significant resistence to immigration. Some of this resistance is ethnocentric; some of it is based on fears of social stress arising from absorbing diverse populations; and some of it is conflict over the eligibility of newcomers for policy benefits from the social welfare state. The big debates will not only be over Awho gets in,@ but also over Awhat happens to those who are here.@
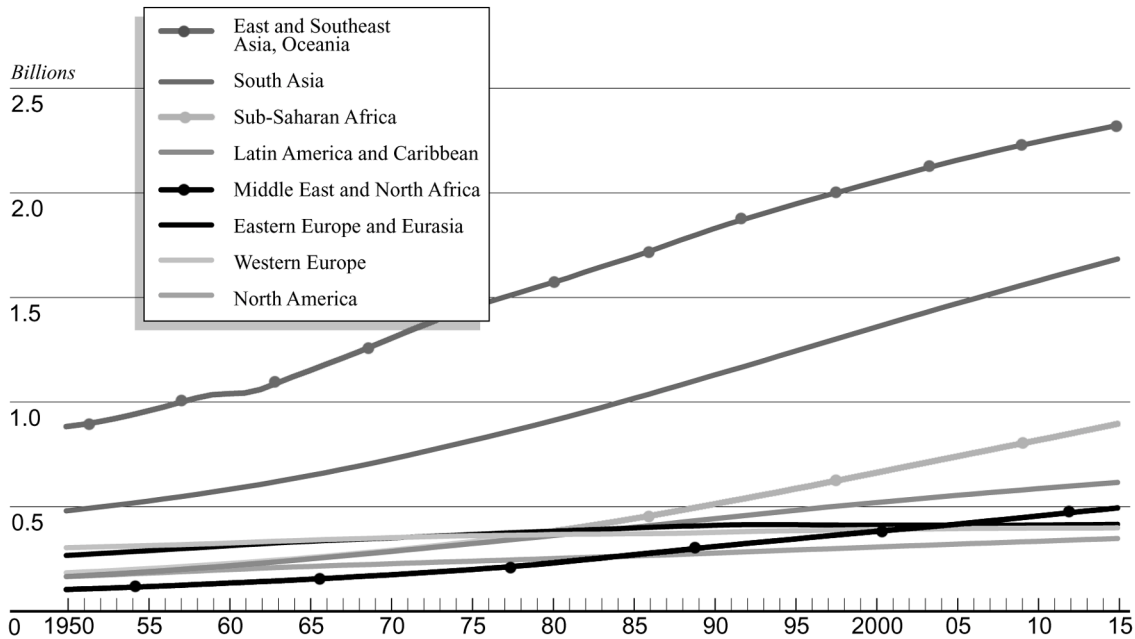
There is a standard witticism (often attributed to physicist Niels Bohr) that Aprediction is difficult, especially about the future.@ It is a pretty safe bet that *GT 2015* has made the right predictions about the broad demographic features of the next couple of decades. But how exactly these features will manifest themselves and what nations choose to do about them remain the bigger questions.

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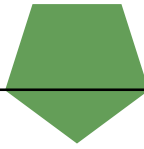
Regional Population: 1950-2015

Billions

Legend:
- East and Southeast Asia, Oceania
- South Asia
- Sub-Saharan Africa
- Latin America and Caribbean
- Middle East and North Africa
- Eastern Europe and Eurasia
- Western Europe
- North America

Source: US Bureau of the Census.

From NIC *Global Trends 2015*

A VIEW FROM RUSSIA

By Alexey V. Yablokov

Aleksey Vladimirovich Yablokov is vice-president of the World Union for the Protection of Nature—IUCN. He served as the first environment adviser to Russian President Boris Yeltsin from 1991 to 1993. He is also the author of more than 20 books about population and evolutionary biology, ecology, radioecology, and environmental policy.

Forecasting is an important activity for working out a picture of the world's future that is not only acceptable but also desirable to at least most of society. The creation of such a collectively approved model of the future would render an enormously positive influence on national and global policy as well as on public opinion. To achieve this, the development of some field of metascience might be necessary. It could arbitrarily be called "*constructive futurology.*"

Below is a brief attempt to highlight global trends that will shape our world in 2015 but that are underemphasized by *GT 2015*. An attempt is also made to evaluate the place and the problems of Russia by 2015.

Global Problems of 2015

In the field of *environment quality and natural resources:*

· Worsening global chemical pollution, causing in particular: (a) not only illnesses, but endocrine disruption and chaotic consequences for individual development (ontogenetic); and (b) global climate change (specifically global warming).

· Worsening global radioactive contamination, causing in particular a sharp increase in the number of stillbirths and perinatal mortality as well as mutations in nature, with unclear effects.

· A shortage of fresh water.

· Widespread deforestation.

In the area of *national security:*

· A weakening of national security for even the largest states because of the development of terrorism, including state terrorism.

· Greater access to weapons of mass destruction by both state and non-state actors. Before 2015, Germany, Japan, Israel, Taiwan, North Korea, Libya, Iraq, and Iran will likely be recognized as nuclear states. Nuclear weapons will lose their current function of deterrence.

· A growth in the simultaneous contradictions between: (a) economic globalization, transparency of borders, and the quick spread of technical achievements; and (b) the increased vulnerability of peaceful, prosperous communities (such as the European Union) to primitive forms of weapons of mass destruction (chemical or biological).

· An expansion of the possibilities of creating an ethnic weapon based on the decoding of the human genome and an intensification of the danger of genocide (e.g., from easily-developed specific ethnic illnesses, immune system damage, or the lowering of fertilization in certain ethnic groups).

Russia by 2015

Analysis of contemporary trends of Russia's social-economic development strongly suggests that Russia is now turning into a secondary world power (comparable to Brazil, Canada, or Australia). But the Russian situation (and predictions of its future) are much more complicated than for those countries or, indeed, than the analysis presented in *GT 2015*. Among the factors at play:

· Russia does not have the money available to destroy its nuclear arsenal; at the same time, many forces within the country want to develop new nuclear weapons.

· Russia is arguably the globe's worst national ecological disaster. Yet it abolished its federal environmental protection agency in 2000.

· Under President Putin's leadership over the last two years, Russian military spending has doubled. Former Russian military leaders have also recently

been elected as regional leaders.

· The mass media's freedom in Russia has visibly declined during the last several years.

· Russia is one of the most corrupt and criminalized countries: no less than 40 percent of the Russian economy today is a shadow one.

· Russia is the only developed country whose people have a declining life expectancy.

Based on these tendencies, I see two different scenarios for Russia by 2015. First, however, I present some general conditions that will hold under either scenario:

· The high intellectual achievements of Russia (such as its development of theoretical and applied science in the 20th century) will continuing to decline and begin to wane after 2015.

· Insufficient attention to infrastructure renovation and reconstruction during last 15 years in Russia will mean a period of industrial and infrastructure catastrophes (in areas such as chemical industry, dams, railways, and nuclear power plants) beginning after 2003-2005.

· The Russian population will decline from a recent level of 147 million to 138-140 million).

· There will be a growing threat of Chinese expansion into Far Eastern Russia.

· The Chechen problem in Russia's North Caucasus will continue beyond year 2015.

· There will be growing tensions with Kazakstan for water resources in the Irtysh and Ural rivers basins.

Pessimistic Scenario

Russia in 2015 will repeat the German experience of the late 1930s—which ended in a totalitarian, auto-cratic, and aggressive society. An alternative outcome would be a Pinochet-type dictatorship.

Optimistic Scenario

President Putin becomes more and more educated, moving from a mostly public relations-style of politics toward construction of a democratic open society. After deep tax reform, a substantial portion of the huge revenue from Russian natural resources will be invested in social needs, science, culture, and education.

Prescription for the West

A reorientation of the West's policy to meaningfully support Russia's weak civil society can stop Russia's development along a totalitarian path, and help us to

move towards the optimistic scenario outlined above. The main objectives of such support should be to:

- Foster an independent mass media in Russia.
- Create an independent and powerful judicial (court) system for the country.
- Activate Russia's nongovernmental organizations

(environmental, human rights, women's, youth), municipal activities, and small and medium-sized businesses.

- Internationally ostracize those Russian officials who have known personal connection with illegal activities. W

THE NATIONAL INTELLIGENCE COUNCIL RESPONDS

By Ellen Laipson

Ellen Laipson is the acting chairman of the National Intelligence Council.

Editor's Note: Admiral Carroll's, Lilian Hisas's, and Alexey Yablokov's commentaries were received too late to be included for consideration in the National Intelligence Council's response.

We are grateful for the opportunity to respond to this colloquy on our study *Global Trends 2015*. It embodies the spirit of our exercise: to engage in a continual dialogue with experts around the country and the world who think about transnational issues and their consequences for U.S. national security. We have been agreeably startled and pleased by the conversation that *GT 2015* has stimulated, and the comments from this distinguished group introduce some new ideas and issues into the debate.

From the many issues the authors raised, we have selected a few key themes, with an emphasis on issues that were raised more than once.

Demography

The idea of the demographic dividend presented by Richard Cincotta is a useful addition to our story. We tended to focus on two endpoints of the demographic story—too high or too low birth rates—and less on this productive middle ground. The examples from East Asia are valuable in pointing out the interaction between changing demographic patterns and public policy with increased educational investment per student as overall numbers of students declined. The cases of South Korea and Taiwan, as Cincotta points out, need to be compared to Brazil and India, which did not fully take advantage of the demographic dividend.

Gayl Ness' observations on changing age structure, in particular the youth bulge as a major stimulant of nationalism, instability, and violence, add much to our analysis. His observation that the countries "with the weakest and most centralized governments are also those

with the high and growing number of young males" deserves careful exploration.

Michael White points out that the migration patterns we identify—movement of workers from low-income countries to higher income countries—are of net benefit to the receiving country. We agree, and we explored this theme in greater detail in our first follow-on study to *GT 2015*, entitled *Growing Global Migration and Its Implications for the United States*, now available on the NIC website (www.odci.gov/nic).

Natural Resources and the Environment

Both Leslie Johnston and Judith Shapiro take us to task for underplaying resource scarcities and the interdependence of natural resources and the environment. Methodologically, Shapiro is right to emphasize that these issues are a highly complex interplay of natural phenomena and decisions that societies and governments will take. We attempted to make this point by exploring a number of "human interventions" which affect the availability of food and water resources or the quality of the environment. Making the point more explicit is a helpful clarification.

On natural resources, both authors specifically challenge our initial assertion that world food grain production and stocks would in principle be adequate to meet global needs by 2015, but they fail to note our subsequent concentration on the maldistribution of food, growing water scarcities, the negative impact of water scarcities on food supplies, and the numerous environmental problems which will worsen with increasingly intensive land use (page 31). We share

Johnston's excellent points on the depletion of fisheries but, having made a macro judgment about aggregate food supplies and their maldistribution, we were reluctant, for reasons of space and level of detail, to elaborate on one subset of that judgment. We did note, however, that there is likely to be effective international cooperation on high-seas fisheries (page 48).

On the environment, particularly climate change, both Johnston and Shapiro see *GT 2015* as flawed by its limited attention to global climate change. We note at several points that the global economic outlook and continued (albeit more efficient) reliance on fossil fuels will substantially increase greenhouse gas emissions. We also project that global climate change will challenge the international community as indicators of a warming climate occur, such as meltbacks of polar ice, sea level rise, and more frequent major storms. Our emphasis on "progress in reducing growth" of greenhouse gas emissions, even in the absence of a global agreement on climate change, was not intended, as Shapiro appears to imply, to put a "positive spin" on what many see as a dire long-term development. Rather, it was intended to suggest that changes such as the adoption of less carbon-intensive development strategies by major developing countries and transnational firms are also underway and are making some incremental progress.

Finally, in response to Shapiro, our highly speculative idea that "a wider religious or spiritual movement, *possibly linked to environmental values*," might emerge was not intended to "dismiss" environmental concerns and the current level of public policy activism. To the contrary, we were arguing that attention to the environment is growing as a preoccupation of many societies, rich and poor. And we were looking for a way to suggest that this concern might also manifest itself in a more personal, less political way.

Governance and Identity

We welcome David Rejeski's and Johanna Forman's insistence on the centrality of governance and institutional capacity. Indeed, we debated whether governance was in fact the transcendent driver in our analysis, the factor that mattered more than any other. We studied and debated as well whether the nation-state would be a major or a much diminished actor in governance—given the enlarged roles that we anticipate for networked national and global non-state actors, both for-profit and non-profit. Our conclusion was that the nation-state would remain key to policy decisions—but successful governance would depend on harnessing the prowess of legitimate non-state actors.

Rejeski's focus on transnational corporations as unusually "effective institutions" for the global age is an apt example. His points about organizational learning capability have broad relevance for thinking about states and organizations that will or won't thrive in a world of transnational transactions. Forman's reflections on the relationship between stability and governance and the efficacy of foreign aid are interesting and worthy of further work. Our study stopped short of drawing direct ties between our judgments and their policy relevance; however, as in this example, *GT 2015* can be linked to an almost endless set of policy issues.

On identity, we welcome the distinction Gavin Kitchingham made between: (a) the UK's *Strategic Context s* treatment of "denationalizing" as a phenomenon among elite, Western groups; and (b) *Global Trends 2015's* discussion that national identity will weaken particularly in nations that are governed inefficiently. Both aspects of the question of "belonging" are important, and we need to do more work on this fascinating issue. We are intrigued by the subtle significance of people having dual (or more) nationalities and being able to participate in more than one culture, economy and social sphere. While *GT 2015* concluded that the nation state is still strong in many parts of the world, we all need to think more about whether "national identity" is being transformed into a more flexible and agile idea for the globally mobile.

Role of the United States in the International System

Many participants in the colloquy welcomed the broad notion of national security that *GT 2015* adopted and commented on the complexity of the challenges the international system and globalization will pose for U.S. national security. Ervin Rokke's rejection of "linearity" in the international system and his remarks on the challenges facing the United States in this "new world" catches the overall thrust of our study particularly well: "*GT 2015* calls for a comprehensive approach to international stability and security that effectively integrates American policy across the spectrum of demographic, ecological, scientific, and economic as well as military drivers."

Michael Hanssler and Arno Weinmann took issue with our characterization of American power as "preeminent" over the next 15 years. They argued that China could well leap ahead, India could become an assertive major player, the poverty gap and digital divide could further discredit the Bretton Woods institutions, new economic and political power balances could develop, and a new system of global governance could well emerge. We are intrigued with this scenario and

argued among ourselves long and hard about these issues, as well as about the prospects for a sustained, networked anti-globalization—and by association, anti-U.S.—political movement. We concluded that there would be intermittent, ad hoc coalitions expressing resistance to specific U.S. policies or to perceived U.S. predominance, but that none would be sufficiently strong or enduring to bring about major changes to the international system. We anticipate that such systemic change would take longer than 15 years and would entail protracted bargaining among states with widely divergent views, independent of whether they might be united in opposition to the United States and its policies.

China

Contributors took us to task for a range of things we said or failed to say about China, its problems, and its potential to threaten U.S. interests. Judith Shapiro thought we understated the severity of China's environmental problems and their consequences for Chinese internal stability; Michael Ledeen found us complacent about China's ability to challenge American interests militarily. In treating the complexities and controversies involved in assessing China's future, we thought our greatest value was laying out the multiple factors and then setting the range of uncertainties. We declined to forecast whether China will succeed in its ambitions or stumble under the magnitude of the challenges facing it and realize we are disappointing many by not drawing stronger conclusions. How China develops, however, is understood by us and by nearly all who contributed to *GT 2015* to be among the greatest potential challenges to our national security interests.

We have commented on only a modest portion of the ideas presented in the essays. We do so, however, with thanks to all the contributors and to the Wilson Center for this stimulating initiative. We have already planned follow-on studies on some *GT 2015* themes. An analysis of migration was released in March 2001, and analyses of democratization, energy, science and technology developments, military power and terrorism will follow in the year ahead. We welcome further collaboration with these experts as we proceed to make *GT 2015* a continuing analytic exchange. **W**
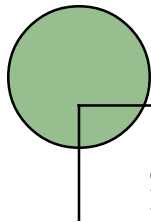
Regional Population by Age Group: 2000 and 2015

Billions
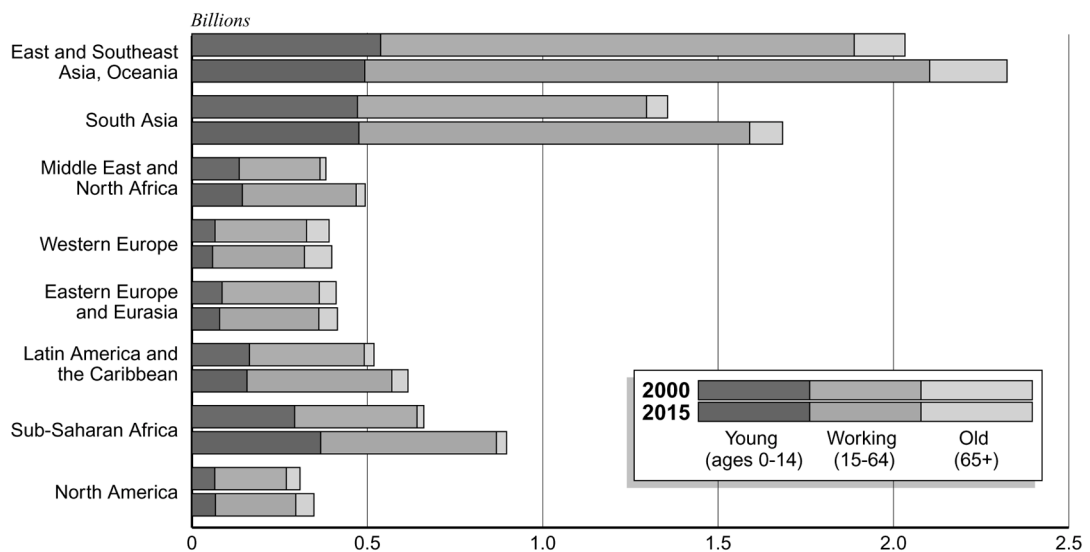
Source: US Bureau of the Census.

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From NIC *Global Trends 2015*

Driver Behavior in the Global Futures Scenarios

	Scenario: Inclusive Globalization	Scenario: Pernicious Globalization
Population	Global population increases by 1 billion people. Pressures from population growth mitigated by high average annual economic growth. Urbanization manageable in many countries, but some cities with rapid population growth become politically unstable. High migration beneficial for sending and receiving countries, although controversial in Europe and Japan.	Additional 1 billion people prove burdensome, since economic stagnation and high unemployment prevent absorption of new job market entrants or migrants. Inadequate urban infrastructure and social services in most cities create conditions ripe for instability and insurgency. South–North migration becomes major source of tension, spurring US and Europe to disengage from developing countries.
Resources	Population increases and robust economic growth will stress ecosystems, resulting in soil degradation, CO_2 pollution, deforestation and loss of species, especially in areas of rapid urbanization. Advanced developing countries largely resolve resource problems, although the poorest developing countries will suffer resource scarcities. In particular, water scarcities will worsen in South Asia, northern China, Middle East, and Africa.	Population growth will contribute to scarcities of arable land and fresh water, exacerbated by inappropriate policies of subsidy and protectionism. Resource scarcities, particularly that of fresh water, will be major problems in both emerging market and developing countries, reducing agricultural production and spurring migration to cities.
Technology	Conditions will be auspicious for rapid innovation, diffusion and implementation of IT, biotechnology, and smart materials. IT will promote productivity gains and higher levels of non-inflationary growth for many countries. Some countries will fall further behind because they lack sufficient education levels, infrastructure, and regulatory systems.	Innovation and diffusion will be slow, due to economic stagnation and political uncertainties. The destabilizing effects of technology will predominate: WMD proliferates; IT empowers terrorists and criminals. Benefits of technology will be realized by only a few rich countries, while most countries will fall further behind.
Economy	US global leadership and economic power, further liberalization of trade, broad acceptance of market reforms, rapid diffusion of IT, and absence of great-power conflict will generate on average 4% annual global economic growth. Emerging markets—China, India, Brazil—and many developing countries will benefit. Some states in Africa, the Middle East, Andean region, Central Asia, and the Caucasus will lag.	A US downturn leads to economic stagnation. Global consensus supporting market reforms will erode, undermining the "American economic model," making US especially vulnerable and leading US to disengage from global involvement. Emerging markets, as well as most developing countries, are hard hit by economic stagnation.
Identity and Governance	Ethnic heterogeneity challenges cohesion of some states, migrant workers create chronic tensions in ethnically homogeneous Europe and East Asia, and communal tensions and violence increase in developing countries with poor governance. In many states benefiting from rapid economic growth and spread of IT, functions of governance will diffuse widely from national governments to local governments and partnerships with business firms, non-profits. Some states' capacity to govern will weaken, and especially in the Andean region, Sub-Saharan Africa, and Central and South Asia.	Ethnic/religious identities sharpen in many heterogeneous states. Communal tensions and violence increase in Africa, Central and South Asia, and parts of Middle East. Political Islam grows. Likelihood of terrorism against targets linked to globalization and the US will increase, hastening Northern disengagement. Weakening of governing capacity at all levels among both developed and developing countries; China and Russia face territorial fragmentation.
Conflict	Absence of great power conflict. Conflict is minimal between and within developed and emerging market countries, due to economic prosperity and growing acceptance of democratic norms. Internal and cross-border conflicts persist in Sub-Saharan Africa, parts of Central, South, and Southeast Asia, and the Andean region due to lack of effective governance and countries' inability to handle population growth, resources scarcities, ethnic tensions, and urbanization. Developed countries will allow many strategically remote conflicts to proceed without attempting to intervene.	Risk of regional conflict in Asia rises substantially. Serious questions arise concerning: • China's territorial integrity. • India's ability to govern. • Future of democracy in Russia. Frequency of internal and interstate conflicts increases, triggered by rising tensions in emerging and developing countries and reduced cooperation among developed countries. WMD restraints will erode, increasing risks of terrorism and regional aggression.

	Scenario: Regional Competition	Scenario: Post-Polar World
Population	Additional 1 billion people prove burdensome for many developing countries, due to slow economic growth and regional protectionism. Cities in many developing countries become unstable, due to growing economic disparities, inadequate infrastructure and services, and weak governance: increasing cross-border migration.	Additional 1 billion people destabilizing some countries, such as Indonesia, and make some rapidly growing cities ungovernable. Population dynamics create opportunities for China and emerging market countries of Latin America and contribute to reordering of great-power relationships in Asia.
Resources	Population growth, economic pressures, and policy failures create resource scarcities, especially in poor countries and highly populated emerging markets. International environmental collaboration weakens, and local conflicts over water spur cross-border migration.	Resource trends similar to those in regional competition scenario.
Technology	Technology advances and commercializes rapidly, but regional protectionism reduces economies of scale and promotes trade barriers. Conflicts over market openings for high technology sectors break out. Developing countries unable to compete in global economy fall into technological backwardness.	Widespread regional protectionism and conflicts over access to high technology develop. Regional and great-power relations in Asia become more contentious. Demand for militarily-relevant technologies in Asia increases.
Economy	Growth is robust, but diminished by effects of regionalism and protectionism. US maintains advantage over Europe and Japan through ability to absorb foreign workers. Emerging markets are targets of developed country mercantilist competition. Other developing countries are neglected by rich countries and atrophied global institutions.	Economic trends similar to those in regional competition scenario.
Identity and Governance	Globalization, assertions of US "hegemony," and cultural changes challenge national identities, contributing to US-European and US-Asian estrangement and increasing US engagement in Latin America. Labor mobility sharpens ethnic/religious identities in countries where immigrants cannot be absorbed. Communal pressures in developing countries increase, in some cases leading to internal communal conflicts. Mercantilist competition strengthens the state. A number of regional organizations are strengthened while global institutions weaken, due to inattention, preoccupation with domestic/regional issues, and EU/Japan resentment of US preeminence.	Globalization and cultural changes contribute to US–European estrangement and increase US engagement in Latin America. Traditional national identities and rivalries stoke intensified nationalism in Asia. Labor mobility sharpens ethnic/religious identities in countries where immigrants cannot be absorbed. Communal pressures increase in many developing countries, and conflicts persist in the Andean region, Indonesia, and elsewhere. Both mercantilist competition and a growing prospect of interstate conflict in Asia strengthen developed and emerging market states' ability to command resources, invest in militarily-relevant technology, and control borders. Both global and regional intergovernmental institutions weaken.
Conflict	Increased regionalism results in conflict over markets, investment flows, and resources, further reducing international collaboration on terrorism, crime, cross-border conflicts, and WMD proliferation. WMD proliferates rapidly and dangerously. High levels of internal and cross-border conflicts persist in developing countries.	As US concentrates on Western Hemisphere and downgrades its presence in Europe and Asia, China drives towards regional dominance, Japan rearms and the risk of great-power conflict increases as US contemplates reasserting influence in Asia. WMD proliferates rapidly and dangerously, particularly in Asia. High levels of internal and cross-border conflicts persist in developing countries.

From NIC *Global Report 2015*

CHINA ENVIRONMENT SERIES
Issue 4

The Working Group on Environment in U.S.-China Relations, a project within the Woodrow Wilson Center's Environmental Change and Security Project, has published its fourth issue of the *China Environment Series*. A tool for researchers, policymakers, and educators, *CES* examines environmental and energy challenges facing China and explores creative ideas and opportunities for governmental and nongovernmental (NGO) cooperation.

The four feature articles in the current issue of *CES* are connected by a common theme of transition and change—specifically, how political and economic changes in China have affected the implementation of environmental and energy policies. Taken together, these articles also paint a clearer picture of the changing role local governments and NGOs (both Chinese and foreign) are playing in shaping the priorities and effectiveness of environmental protection and energy initiatives in China.

New to *CES* in this issue is a "Commentaries/Notes From the Field" section, including submissions from new China scholars and energy researchers.

Feature Articles
Hot Air and Cold Water: The Unexpected Fall in China's Energy Use
Jonathan Sinton and David Fridley

Local Environmental Management in China
Marilyn Beach

Paying for the Environment in China: The Growing Role of the Market
Sun Changjin

Total Emission Control of Major Pollutants in China
Dan Dudek, Ma Zhong, Jianyu Zhang, Guojun Song, and Shuqin Liu

Commentaries/Notes From the Field
Charge to the Bush Administration: U.S. Interests in Energy Cooperation with China—Kelly Sims
China's Changing Carbon Dioxide Emissions—Jeffrey Logan
"Seeking Contradictions" in the Field: Environmental Economics, Public Disclosure, and Cautious Optimism about China's Environmental Future—*Eric Zusman*
Environmental Disputes and Public Service: Past and Present—Anna Brettell
Clues and Cues—Humphrey Wou
The Changing Context for Taiwanese Environmental NGOs—Sean Gilbert
Let A Thousand Muckrakers Bloom—Ray Cheung

CES 4 also contains an updated and expanded "Inventory of Environmental Projects in China," which describes projects conducted by U.S. government agencies as well as nongovernmental and multilateral organizations.

To obtain a copy of *China Environment Series* 4, please contact Jennifer Turner at 202-691-4233 or by email at chinaenv@erols.com. You may also download a copy from the ECSP web site at http://ecsp.si.edu.

FORUM

IS THERE A POPULATION IMPLOSION?

Nicholas Eberstadt's article in the March-April 2001 issue of Foreign Policy *entitled "The Population Implosion" touched off a minor sensation among those in the fields of population policy and demography. In the article, Eberstadt argued that the contemporary era of global "population explosion," in which world population had nearly quadrupled in a century, is ending. He also questioned the wisdom of ongoing efforts to depress birthrates, arguing that "the continuing preoccupation with high fertility and rapid population growth has left the international population policy community poorly prepared to comprehend (much less respond to) the demographic trends emerging around the world today"—namely, subreplacement fertility patterns, the aging of many societies, and intensive and prolonged mortality crises such as HIV/ AIDS.*

The Environmental Change and Security Project invited Dr. Eberstadt and five other population professionals (Stan Bernstein of the United Nations Population Fund; Carmen Barroso of the MacArthur Foundation; Amy Coen of Population Action International; Sonia Corrêa of the Brazil Institute of Social and Economic Analysis; and Parfait M. Eloundou-Enyegue of Cornell University) to participate in an on-line forum on the state of demographic trends and population policy. Using "The Population Implosion" as a catalyst, we wanted the forum to address questions such as: Should population growth continue to be considered a pressing international issue? How should we interpret the mixed messages in recent statistics and projections about the population growth rate? Has the recent success in bringing growth rates down led to a false sense of security and a resultant decline in family planning funding? What is the importance of demographic shifts in some developed countries? Should those countries, in fact, be promoting higher birth rates?

The resultant debate was erudite, passionate, and quite illuminating. A transcript of the forum's postings follows excerpts from Dr. Eberstadt's article.

Excerpts from "The Population Implosion"

By Nicholas Eberstadt

It may not be the first way we think of ourselves, but almost all of us alive today happen to be children of the "world population explosion"—the momentous demographic surge that overtook the planet during the course of the 20th century. Thanks to sweeping mortality declines, human numbers nearly quadrupled in just 100 years, leaping from about 1.6 or 1.7 billion in 1900 to about 6 billion in 2000.

This unprecedented demographic expansion came to be regarded as a "population problem," and in our modern era problems demand solutions. By century's end, a worldwide administrative apparatus—comprised of Western foundations and aid agencies, multilateral institutions, and Third World "population" ministries— had been erected for the express purpose of "stabilizing" world population and was vigorously pursuing an international antinatal policy, focusing on low-income areas where fertility levels remained relatively high.

To some of us, the wisdom of this crusade to depress birthrates around the world (and especially among the world's poorest) has always been elusive. But entirely apart from its arguable merit, the continuing preoccupation with high fertility and rapid population growth has left the international population policy community poorly prepared to comprehend (much less respond to) the demographic trends emerging around the world today—trends that are likely to transform the global population profile significantly over the coming generation. Simply put, the era of the worldwide "population explosion," the only demographic era within living memory, is coming to a close.

Continued global population growth, to be sure, is in the offing as far as the demographer's eye can see. It would take a cataclysm of biblical proportions to prevent an increase in human numbers between now and the year 2025. Yet global population growth can no longer be accurately described as "unprecedented." Despite the imprecision of up-to-the-minute estimates, both the pace and absolute magnitude of increases in human numbers are markedly lower today than they were just a few years ago. Even more substantial decelerations of global population growth all but surely await us in the decades immediately ahead.

In place of the population explosion, a new set of demographic trends—each historically unprecedented in its own right—is poised to reshape, and recast, the world's population profile over the coming quarter century. Three of these emerging tendencies deserve special mention. The first is the spread of "subreplacement" fertility regimens, that is, patterns of childbearing that would eventually result, all else being equal, in indefinite population decline. The second is the aging of the world's population, a process that will be both rapid and extreme for many societies over the coming quarter-century. The final tendency, perhaps the least appreciated of the three, is the eruption of intense and prolonged mortality crises, including brutal peacetime reversals in health conditions for countries that have already achieved relatively high levels of life expectancy.

For all the anxiety that the population explosion has engendered, it is hardly clear that humanity will be better served by the dominant demographic forces of the post-population-explosion era. Nobody in the world will be untouched by these trends, which will have a profound impact on employment rates, social safety nets, migration patterns, language, and education policies. In particular, the impact of acute and extended mortality setbacks is ominous. Universal and progressive peacetime improvements in health conditions were all but taken for granted in the demographic era that is now concluding; they no longer can be today, or in the era that lies ahead.

The Global Baby Bust

The world's population currently totals about 6 billion, rather than 9 billion or more, because fertility patterns also changed over the course of the 20th century. And of all those diverse changes, without question the most significant was secular fertility decline: sustained and progressive reductions in family size due to deliberate birth control practices by prospective parents…

Indeed, subreplacement fertility has suddenly come amazingly close to describing the norm for childbearing the world over. In all, 83 countries and territories are thought to exhibit below-replacement fertility patterns today. The total number of persons inhabiting those countries is estimated at nearly 2.7 billion, roughly 44 percent of the world's total population.

Secular fertility decline originated in Europe, and virtually every population in the world that can be described as of European origin today reports fertility rates below the replacement level. But these countries and territories today currently account for only about a billion of the over 2.5 billion people living in "subreplacement regions." Below-replacement fertility is thus no longer an exclusively—nor even a predominantly—European phenomenon. In the Western Hemisphere, Barbados, Cuba, and Guadeloupe are among the Caribbean locales with fertility rates thought to be lower than that of the United States. Tunisia, Lebanon, and Sri Lanka have likewise joined the ranks of subreplacement fertility societies…

The largest concentration of subreplacement populations, however, is in East Asia. The first non-European society to report subreplacement fertility during times of peace and order was Japan, whose fertility rate fell below replacement in the late 1950s and has remained there almost continuously for the last four decades. In addition to Japan, all four East Asian tigers—Hong Kong, the Republic of Korea, Singapore, and Taiwan—have

reported subreplacement fertility levels since at least the early 1980s. By far the largest subreplacement population is in China, where the government's stringent antinatal population control campaign is entering its third decade.

The singularity of the Chinese experience, however, should not divert attention from the breadth and scale of fertility declines that have been taking place in other low-income settings. A large portion of humanity today lives in countries where fertility rates are still above the net replacement level, but where secular fertility decline is proceeding at a remarkably rapid pace…

The remarkable particulars of today's global march toward smaller family size fly in the face of many prevailing assumptions about when rapid fertility decline

is striking for the absence of broad, obvious, and identifiable socioeconomic thresholds or common preconditions. (Reviewing the evidence from the last half-century, the strongest single predictor for any given low-income country's fertility level is the calendar year: The later the year, the lower that level is likely to be.) If you can find the shared, underlying determinants of fertility decline in such disparate countries as the United States, Brazil, Sri Lanka, Thailand, and Tunisia, then your Nobel Prize is in the mail.

Two points, however, can be made with certainty. First, the worldwide drop in childbearing reflects, and is driven by, dramatic changes in desired family size. (Although even this observation only raises the question

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What accounts for the worldwide plunge in fertility now underway? The honest and entirely unsatisfying answer is that nobody really knows— at least, with any degree of confidence and precision. –Nicholas Eberstadt, "The Population Implosion"

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can, and cannot, occur. Poverty and illiteracy (especially female illiteracy) are widely regarded as impediments to fertility decline. Yet, very low income levels and very high incidences of female illiteracy have not prevented Bangladesh from more than halving its total fertility rate during the last quarter-century. By the same token, strict and traditional religious attitudes are commonly regarded as a barrier against the transition from high to low fertility. Yet over the past two decades, Iran, under the tight rule of a militantly Islamic clerisy, has slashed its fertility level by fully two-thirds and now apparently stands on the verge of subreplacement. For many population policymakers, it has been practically an article of faith that a national population program is instrumental, if not utterly indispensable, to fertility decline in a low-income setting. Iran, for instance, achieved its radical reductions under the auspices of a national family planning program. (In 1989, after vigorous doctrinal gymnastics, the mullahs in Tehran determined that a state birth control policy would indeed be consistent with the Prophet's teachings.) But other countries have proven notable exceptions. Brazil has never adopted a national family planning program, yet its fertility levels have declined by well over 50 percent in just the last 25 years.

What accounts for the worldwide plunge in fertility now underway? The honest and entirely unsatisfying answer is that nobody really knows—at least, with any degree of confidence and precision. The roster of contemporary countries caught up in rapid fertility decline

of why personal attitudes about these major life decisions should be changing so commonly in so many disparate and diverse locales around the world today.) Second, it is time to discard the common assumption, long championed by demographers, that no country has been modernized without first making the transition to low levels of mortality and fertility. The definition of "modernization" must now be sufficiently elastic to stretch around cases like Bangladesh and Iran, where very low levels of income, high incidences of extreme poverty, mass illiteracy, and other ostensibly "nonmodern" social or cultural features are the local norm, and where massive voluntary reductions in fertility have nevertheless taken place.

SEND YOUR HUDDLED MASSES ASAP

The natural growth of population in the more developed countries has essentially ceased. The overall increase in population for 2000 in these nations is estimated at 3.3 million people, or less than 0.3 percent. Two thirds of that increase, however, is due to immigration; the total "natural increase" amounts to just over 1 million. Over the coming quarter century, in the U.S. Census Bureau's projections, natural increase adds only about 7 million people to the total population of the more developed countries. And after the year 2017, deaths exceed births more or less indefinitely. Once that happens, only immigration on a scale larger than any in the recent past

can forestall population decline…

The issue clearly will not be supply, but rather demand. Will Western countries facing population decline opt to let in enough outsiders to stabilize their domestic population levels? Major and sustained immigration flows will entail correspondingly consequential long-term changes in a country's ethnic composition, with accompanying social alterations and adjustments. Such inflows will also require a capability to assimilate newcomers, so that erstwhile foreigners (and their descendants) can become true members of their new and chosen society…

A Grey World

The world's population is set to age markedly over the coming generation: The longevity revolution of the 20th century has foreordained as much. The tempo of social aging, however, has been accelerated in many countries by extremely low levels of fertility…

Population aging will be most pronounced in today's more developed countries. By the U.S. Census Bureau's estimates, the median age for this group of countries today is about 37 years. In 2025, the projected median age will be 43. Due to its relatively high levels of fertility and immigration (immigrants tend to be young), the population of the United States is slated to age more slowly than the rest of the developed world. By 2025, median age in the United States will remain under 39 years. For the rest of the developed world, minus the United States, median age will be approximately 45 years. And for a number of countries, the aging process will be even further advanced…

Population aging, of course, will also occur in today's less developed regions. Current developed countries grew rich before they grew old; many of today's low-income countries, by contrast, look likely to become old first. One of the most arresting cases of population aging in the developing world is set to unfold in China, where relatively high levels of life expectancy, together with fertility levels suppressed by the government's resolute and radical population control policies, are transforming the country's population structure. Between 2000 and 2025, China's median age is projected to jump by almost 9 years. This future China would have one-sixth fewer children than contemporary China, and the 65-plus population would surge by over 120 percent, to almost 200 million. These senior citizens would account for nearly a seventh of China's total population…

Death Makes a Comeback

Given the extraordinary impact of the 20th century's global health revolution, well-informed citizens around the world have come to expect steady and progressive improvement in life expectancies and health conditions during times of peace. Unfortunately, troubling new trends challenge these happy presumptions. A growing fraction of the world's population is coming under the grip of peacetime retrogressions in health conditions and mortality levels. Long-term stagnation or even decline in life expectancy is now a real possibility for urbanized, educated countries not at war. Severe and prolonged collapses of local health conditions during peacetime, furthermore, are no longer a purely theoretical eventuality. As we look toward 2025, we must consider the unpleasant likelihood that a large and growing fraction of humanity may be separated from the planetary march toward better health and subjected instead to brutal mortality crises of indeterminate duration…

In the early post-World War II era, the upsurge in life expectancy was a worldwide phenomenon. By the reckoning of the U.N. Population Division, in fact, not a single spot on the globe had a lower life expectancy in the early 1970s than in the early 1950s. And in the late 1970s only two places on earth—Khmer Rouge-ravaged Cambodia and brutally occupied East Timor—had lower levels of life expectancy than 20 years earlier. In subsequent years, however, a number of countries unaffected by domestic disturbance and upheaval began to report lower levels of life expectancy than they had known two decades earlier. Today that list is long and growing. U.S. Census Bureau projections list 39 countries in which life expectancy at birth is anticipated to be at least slightly lower in 2010 than it was in 1990. With populations today totaling three-quarters of a billion people and accounting for one-eighth of the world's population, these countries are strikingly diverse in terms of location, history, and material attainment.

This grouping includes the South American countries of Brazil and Guyana; the Caribbean islands of Grenada and the Bahamas; the Micronesian state of Nauru; 10 of the 15 republics of the former Soviet Union; and 23 sub-Saharan African nations. As might be surmised from the heterogeneity of these societies, health decline and mortality shocks in the contemporary world are not explained by a single set of factors, but instead by several syndromes working simultaneously in different parts of the world to subvert health progress…

In sub-Saharan Africa, a different dynamic drives mortality crises: the explosive spread of the HIV/AIDS epidemic. In its most recent report, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that 2.8 million died of AIDS in 1999, 2.2 million in sub-Saharan Africa alone. UNAIDS also reported that almost 9 percent of the region's adult population is already infected with the disease. By all indications, the epidemic is still spreading in sub-Saharan Africa. As of 2000, UNAIDS projected that in several sub-Saharan countries, a 15-year-old boy today faces a

Social aging sets in motion an array of profound changes and challenges and demands far-reaching adjustments if those challenges are to be met successfully. But social aging is primarily a consequence of the longer lives that modern populations enjoy. And the longevity revolution, with its attendant enhancements of health conditions and individual capabilities, constitutes an unambiguous improvement in the human condition. Pronounced and prolonged mortality setbacks portend just the opposite: a diminution of human well-being, capabilities, and choices.

Given today's historically low death rates and birthrates, however, the arithmetic fact is that the great majority of people who will inhabit the world in 2025 are already alive.
–Nicholas Eberstadt, *"The Population Implosion"*

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greater than 50 percent chance of ultimately dying from AIDS—even if the risk of becoming infected were reduced to half of current levels…

THE SHAPE OF THINGS TO COME

Looking toward 2025, we must remember that many 20th-century population forecasts and demographic assessments proved famously wrong. Depression-era demographers, for example, incorrectly predicted depopulation for Europe by the 1960s and completely missed the "baby boom." The 1960s and 1970s saw dire warnings that the "population explosion" would result in worldwide famine and immiseration, whereas today we live in the most prosperous era humanity has ever known. In any assessment of future world population trends and consequences, a measure of humility is clearly in order.

Given today's historically low death rates and birthrates, however, the arithmetic fact is that the great majority of people who will inhabit the world in 2025 are already alive. Only an apocalyptic disaster can change that. Consequently, this reality provides considerable insight into the shape of things to come. By these indications, indeed, we must now adapt our collective mind-set to face new demographic challenges.

A host of contradictory demographic trends and pressures will likely reshape the world during the next quarter century. Lower fertility levels, for example, will simultaneously alter the logic of international migration flows and accelerate the aging of the global population.

It is unlikely that our understanding of the determinants of fertility, or of the long-range prospects for fertility, will advance palpably in the decades immediately ahead. But if we wish to inhabit a world 25 years from now that is distinctly more humane than the one we know today, we would be well advised to marshal our attention to understanding, arresting, and overcoming the forces that are all too successfully pressing for higher levels of human mortality today.

FORUM DIALOGUE
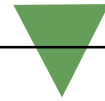
Amy Coen, Population Action International

I want to thank the Woodrow Wilson Center's Environmental Change and Security Project for organizing this discussion. Then I want to jump right into some questions for Nicholas Eberstadt, author of "The Population Implosion." These questions are rooted in my own experience as a reproductive health provider for all my working life.

Dr. Eberstadt asserts that foreign assistance to family planning programs overseas is unwise, and that government-run family planning services are "a questionable investment." Yet he acknowledges throughout his article that low-income couples around the world increasingly express a preference for raising small families. Would Dr. Eberstadt agree that there is a growing demand worldwide for family-planning services and information?

Recent analyses indicate that roughly 75 percent of potential clients in sub-Saharan Africa cannot afford family planning methods at current contraceptive wholesale prices alone. This calculation excludes the not-insignificant costs of providing services related to contraception. Moreover, these contraceptives and related services become even less affordable to the poor after an unwanted childbirth. Would Dr. Eberstadt agree that governments should play a role in helping low-income women gain access to the means to safely manage their own childbearing, especially when they themselves clearly want that access?

Studies have found that, when family-planning services are more expensive than low-income users can afford, users will often risk less-effective traditional methods or rely on abortion (which is illegal and unsafe in many developing countries). Many providers offer counseling and basic maternal and child services and can treat septic abortions. Shouldn't some of the costs of family-planning services be subsidized for low-income clients, particularly when research shows the positive effects of such services on national economics and the health and well-being of women and children?

Just as importantly, governments do have a legitimate interest in the impacts of growing populations on the nations they govern; and the same policies that improve individual health and well-being also slow population growth. More than half a billion people live in countries where water stress or scarcity hampers economic development and health. But the number of people with water shortages is significantly lower than it would have been had governments, the United Nations, the World Bank, and nongovernmental organizations not invested decades ago in improved family planning services for developing countries. And continuing to expand access to reproductive health care is a crucial way to stem worsening scarcities of water and other critical natural resources. The largest generation ever of young people is now entering its reproductive years, and a higher proportion than ever before wants to postpone childbearing and limit family sizes. If these young people succeed in their own reproductive aspirations, world population could level off in this century. No population "implosion" is likely, by the way—only an end to population growth that won't be sustainable for very long.

Should governments support the revolution in childbearing, which benefits us all? Or should they frustrate it, telling young people essentially that "when it comes to sex and reproduction, you're on your own. Good luck!" The latter flies in the face of the abundant evidence that access to reproductive health services contributes to individual economic well-being as well as to broader social, economic, and environmental benefits.

Dr. Eberstadt's opinion of foreign assistance and public services implies that he considers the impacts on their private sector too great. Shouldn't we weigh those putative effects against the impact of unintended childbearing, unsafe abortion, and the lives of roughly half a million women who die each year from causes related to pregnancy and childbirth? Shouldn't governments be making efforts to close education gaps, to at least narrow income gaps, and to help improve their citizens' quality of life?

In "The Population Implosion," Dr. Eberstadt points to Brazil as a model of a successful nongovernmental program. But though largely self-sufficient now, Brazilian nongovernmental family-planning organizations and private providers were assisted for decades by foreign donors who subsidized contraceptives and marketing efforts and helped pay for training and research. Brazilian organizations have done a remarkable job providing reproductive health services in often-difficult circumstances. Yet a recent study concluded that there is a need in Brazil to develop further decentralized public-sector reproductive health services in order to: (a) provide care for underserved populations; and (b) improve the mix of contraceptive methods, which is still weighted

toward female sterilization.

Without government or donor involvement in the early stages of economic development, how does Dr. Eberstadt propose that low-income couples obtain decent quality reproductive health services? In "The Population Implosion," he urged his readers to pay greater attention to the upsurge in infectious disease—much of it, of course, sexually transmitted. Yet in his longer discourse on fertility decline, Dr. Eberstadt never acknowledged the health benefits of access to family planning on women's health and social status. He fails to mention the health and economic risks inextricably linked to unprotected sex, high rates of unwanted pregnancy, unsafe abortion, and high rates of maternal and infant mortality. Nor does "The Population Implosion" treat the detrimental effects of early childbearing on girls' educational attainment and on women's participation in the labor force. Yet in 1990, even before the full impact of AIDS was felt, the World Health Organization calculated that reproductive illnesses accounted for about 38 percent of all premature death and disability among reproductive-age women in sub-Saharan Africa (compared to 8 percent among similarly-aged men). For Indian women, this statistic reached 28 percent. Among African women, the risk of dying from complications of pregnancy, childbirth, or unsafe abortion is now 1 in 15. It is 1 in 3,750 for women in the United States.

Are the benefits of family planning and related programs too trivial for the United States to consider investing in these programs? Are women not part of Dr. Eberstadt's economic calculus? Or do the challenges of absorbing a high proportion of elderly in the population (a few decades after fertility decline begins) outweigh the immediate health and social benefits of family planning for women today?

I look forward to this discussion. It is indeed valuable to consider where world population is likely to go from here, and what the implications of that are for all societies—poor as well as wealthy. Just as importantly, I hope we will consider the many non-demographic benefits to expanding access to those client-centered reproductive health services that offer a range of choices on family planning and disease prevention.

Sonia Corrêa, Brazil Institute of Social and Economic Analysis

I want to thank the Woodrow Wilson Center's Environmental Change and Security Project for the invitation to participate in the forum. For somebody entering this conversation from a feminist and developing-

country perspective, this is a privileged opportunity to engage with the population debate as it is being currently framed in the United States. From this viewpoint, I am somewhat surprised by the absence thus far of explicit references to the International Conference on Population and Development (ICPD) Program of Action formulated at Cairo in 1994. Let me briefly recapitulate the work of the ICPD.

In Cairo (and a year later in Beijing), the global population policy agenda clearly shifted from an emphasis on fertility control measures (which translated into vertical family planning programs) to a framework combining:

other cases where policies were/are not so strict but which are quite far from success stories in terms of respecting and promoting reproductive rights. (Bangladesh, Indonesia, Vietnam, and India are just a few illustrations.)

On the other hand, full respect for human rights is also necessary in countries experiencing "sub-replacement fertility." To force people to have babies they do not want is as abusive as to sterilize people against their will. And, as we know, sometimes this is done through extremely draconian measures: it suffices to recall the Ceaucescu regime's restriction of abortion in Romania, which resulted in dramatic increases in maternal mortality

> **Although Cairo meant a fundamental transformation of the population debate, Dr. Eberstadt's arguments are, by and large, constructed as if the global policy environment remained fundamentally informed by the fertility-control premises of the 1960's and 1970's.**
> **—Sonia Corrêa**

(a) the respect for human rights; (b) the promotion of human development (health, in particular sexual and reproductive health as well as education, employment, and sustainable livelihoods); and (c) gender equality and equity.

Although Cairo meant a fundamental transformation of the population debate, Dr. Eberstadt's arguments are, by and large, constructed as if the global policy environment remained fundamentally informed by the fertility-control premises of the 1960's and 1970's. As I see it, the "Cairo Agenda" should not to be forgotten or abandoned—not least of which because it illuminates both the demographic trends underlined by Dr. Eberstadt and the problems raised by Dr. Coen. Dr. Coen is right in calling attention to the fact that fertility dropped in countries as diverse as Brazil, Iran, and Italy because "couples" currently prefer smaller families and therefore need information and means to make their reproductive decisions. But I would like to add other elements to the picture.

Decisions with respect to the spacing and number of children must be free of coercion and discrimination. They must be grounded in the respect for the human rights of involved persons—or, to be more precise, respect for the reproductive rights of involved persons. Consequently, much work and expense remains, even in those countries where fertility has decreased or is rapidly declining. This is particularly true in places where decline has resulted from stringent fertility control policies. The most evident example is China. But the same applies to

rates.

A second missing piece is gender inequality (or gender relations). An extensive bulk of literature is available to demonstrate that, in most settings, reproductive intentions of women widely differ from reproductive intentions of men. In many places even today, women have children they did not want simply because they are entirely subject to what their husbands/partners want, say, and do. Extended families and communities frequently reinforce these constraints. Consequently, it is important to underline that reproductive rights as defined by the ICPD (a definition that includes access to information and family planning methods) does not refer exclusively to couples but to *couples and individuals*; and that women must be empowered (against all odds) to fully exercise these rights.

But gender analysis, while being extremely relevant to understand high fertility regimes, is also meaningful to examine what happens in societies experiencing (or moving towards) sub-replacement fertility. Feminist analyses of what is occurring in Japan, Italy, and Spain indicate that, in a democratic environment, women will not have more children than they want (or consider they can cope with) if deep changes in gender relations do not take place. In these countries, women are demanding a fairer distribution of responsibilities and workload between women and men with regard to the burdens of "social reproduction." Along the same line, policy definitions of Nordic countries suggest that even positive incentives to have larger families may not work properly if the unbalanced gender division of labor is not

addressed and modified.

Last but not least, emerging mortality trends can and should be examined through a gender lens. Let's consider, for instance, the factors underlying the dramatic losses in life expectancy observed in sub-Saharan Africa under the impact of HIV-AIDS. It is impossible to contain the pandemic in the African continent without consistently addressing gender inequality, particularly in the domain of sexuality. Yet recent increases in mortality rates in Eastern Europe and Russia reveal that a disproportionate number of those dying are men. I would like to ask Dr. Eberstadt: how can we explain these differentials?

Finally, I want to comment more specifically to Dr. Coen's posting. She refers explicitly to reproductive health services and other critical sexual and reproductive health problems (such as abortion, maternal mortality, and sexually transmitted diseases). Although she ends her argument by mentioning the non-demographic benefits of these programs, the emphasis is mostly on family planning. I would like, therefore, to remind the forum as well that sexual and reproductive health—as defined by the ICPD—is not simply "other services attached to family planning." Rather, it is a broader policy agenda in which family planning is but one component (although a very important one).

To illustrate this point, I will use the example of my own country. In Brazil, fertility rates have declined as rapidly as in China, and contraceptive prevalence is reaching industrialized countries' level. However, maternal mortality rates in Brazil remain unacceptable; pre-natal and obstetric care still require much improvement; and, most importantly, HIV infection among Brazilian women keeps increasing (when overall transmission is decreasing). This last trend is directly related to gender inequality (women still do not have full power to negotiate in the domain of sexuality) as well as to contraceptive prevalence patterns (it is not surprising that a sterilized women will not use a condom when having sex with their husbands). The Brazilian experience also indicates that lower fertility neither automatically translates into poverty reduction nor prevents environmental degradation.

I will later have additional comments on the references made by Dr. Coen and Dr. Eberstadt to Brazil as well as on the implications of global economic trends for current demographic trends. But I would rather conclude now by saying that I am also convinced that we face great (and many) human development challenges, few of them directly related to population dynamics. These challenges certainly require much intellectual investment and mobilization of public and private resources as well as creative solutions. However, they

cannot be simply understood as a move from the population bomb crisis to the population implosion crisis. Most principally, the policy discussions related to them should no longer—after the UN Conferences of the 1990s—be narrowed down to the old debate regarding more or less funding for family planning.

Carmen Barroso, The MacArthur Foundation

First of all, appreciation is due to the Environmental Change and Security Project for hosting this important discussion. Thanks also to Nick Eberstadt for agreeing to discuss his long-held skepticism regarding population policies. He rightfully calls attention to the importance of changes in age structures, and he joins the voices urging control of rising mortality in sub-Saharan Africa and elsewhere. His discussion of population policies is nevertheless misdirected for two major reasons.

First, there is no population implosion on the horizon. While global fertility has declined sharply, the world's population is still expected to grow from 6.1 billion today to 9.3 billion in 2050, according to the just released projections of the United Nations. The UN's past projections of world population in 2000 have proven highly accurate. In a letter to *Foreign Policy*, John Bongaarts points out that, even in the industrialized world, the significant declines expected in some populations (e.g., Russia, Japan, Germany, and Italy) are offset by the expected continued growth in the United States, Canada, and Australia. As a result, by 2050, the industrialized world of today is expected to have a population close to the current 1.2 billion.

Second, the population policies Dr. Eberstadt criticizes are not the ones prevailing today. The new paradigm adopted in the 1990s is oriented by a human rights approach. Its major purpose is to create enabling conditions for responsible reproductive choices. The creation of these conditions is needed in high fertility and low fertility settings alike. Dr. Eberstadt's arguments are directed against a "crusade to depress birthrates" that is at total odds with the consensus reached at the International Conference on Population and Development back in 1994. Sonia Corrêa has made this point beautifully. I only want to point out that gender equality—the most important "enabling condition" that is at the core of current approaches to population policies— is also key to avoiding below-replacement fertility. Women in industrialized countries typically want

two children. If society's organization of the "care economy" did not put an enormous burden on the shoulders of those who want to combine children with a career, we could well see some increase in fertility.

Dr. Eberstadt is absolutely right on the need to arrest the forces bringing higher levels of mortality in important parts of the world. It should be stressed, though, that population policies that make available the information and the barrier methods needed for the practice of safe sex are also the best means of prevention of AIDS, one of the major causes of mortality in Africa today—and likely to be soon in Asia and other parts of the world.

Two thousand grantmakers gathered in May at the annual meeting of the Council on Foundations and gave a standing ovation to Kofi Annan when he presented his plan for a $10 billion effort to halt the global spread of AIDS. Economists are now making the case for adequate resources for the fight against AIDS: they argue, for instance, that the devastation wrought by AIDS in Africa is precluding the higher levels of productivity needed to bring down the price of oil.

The resources needed for fighting AIDS and the obstacles on the ground may seem daunting, but the successful cases of Brazil, Uganda, and Senegal show that they are not insurmountable. It is true that, even in the case of Brazil, gender inequalities are still a problem. But Brazil has shown that dire predictions can be reversed. It has been able to stem the AIDS crisis because it had the most important requirement for doing so: political commitment. And it was the demand of Brazilian civil society that made AIDS a priority of that country's government. At the MacArthur Foundation Population Area, we are proud to have contributed to this effort by helping to support those Brazilian women's organizations and AIDS activists that have forcefully articulated that demand. I offer this example to illustrate the point that population policies can and must be linked to sexually-transmitted diseases and thus to the control of mortality.

Finally, I would like to welcome the emphasis Dr. Eberstadt gives to the transformation of age structures. Policymakers that ignore this transformation will end up planning for yesterday's world. It would be important to consider the different paces at which age structures are changing in different countries in the context of a globally-connected world. Policies and conditions in one country have important implications for others.

For example, the latest report of the Inter-American Development Bank examines the "demographic dividend" that Latin America may have as a result of the gap between its demographic transition and that of developed countries. In other words, developed regions have large retirement-age populations looking for greater capital returns on their big pools of savings, which might lead to long-term investments of these savings in other regions (such as Latin America) with large numbers of young productive workers. Some poorer countries also benefit from the substantial remittances sent by young migrants who are working in industrialized countries. The migrants usually send these funds directly to their families; but the remittances are now also taking the innovative form of "home town associations." Based in industrialized countries, these cooperatives fund infrastructure and development work in their participants' places of origin. These examples show that not all the important effects of changes in age structure are immediately obvious.

In conclusion, both (a) the recognition of these issues' complexity, and (b) the acceptance of the values underlying rights-based population policies call for moving away from the 200-year old dispute between the pessimist Malthus and the optimist Condorcet. The current debate should be about how we can take account of current demographic changes as we try to maximize individual happiness and social, racial, and gender equity.

Stan Bernstein, United Nations Population Fund

I'd like to join the other participants in thanking the Woodrow Wilson Center's Environmental Change and Security Project for giving us the opportunity to have this important discussion about population trends, their social bases, and their consequences and programmatic implications. I would like to join Dr. Coen, Ms. Corrêa, and Dr. Barrosso in stressing that, in the area of population, decades of experience and increasing responsiveness to grassroots concerns have produced a powerful, complex, and sensitive international consensus. Human rights are central to our understanding of population programmes—the right (a) to make informed and responsible decisions about child-bearing and the means to implement them; (b) to health and to development; and (c) to women's rights in multiple realms. These rights are basic. Population policies and programmes are properly parts of the entire health and social development agenda.

As Ms. Corrêa so clearly reminds us, gender issues are central to understanding the dynamics that produce the outcomes we observe—whether they relate to

mortality, fertility, education, migration, disease susceptibility, or life prospects. This is a far more insightful approach for the analysis and definition of policies, programmes, and priorities than the curiously disembodied focus on population totals of Dr. Eberstadt.

Dr. Eberstadt's *Foreign Policy* article at times confounds past trends and future projections, particularly in the area of fertility. For example, its graphs and text present fertility estimates and projections for 1975, 2000, and 2025 as though they are equally accurate and certain. Of course we need to make reasonable medium-term projections and plan our policies and programmes, often with substantial lead times. But we also need to deal with substantial existing problems seriously rather than assuming them away to a projected future.

The historical record of projections is quite good at highly-aggregated levels, but more inaccurate at the country level. Projections are also often wrong in the relative contributions of mortality, births, and deaths to the totals. (Projections of 40 years ago got the total current populations right, but underestimated the pace and timing of fertility and mortality declines.) Projections of future demographic parameters can only be an educated extrapolation of existing trends. Dr. Eberstadt quite correctly raises questions about the certainty of projecting continuing improvements in future mortality trends. He is far more trusting of the certainty of fertility declines than evidence would warrant. There is something almost automatic about his presentation of "secular fertility declines"—despite his protestations that we remain ignorant of the causes of these declines, or his failure to recognize that couples and individuals everywhere have always adjusted their family sizes (if less efficiently and with more deaths), even prior to modern contraceptives.

As he concentrates on sheer numbers, Dr. Eberstadt fails to take note of the choices and dynamics underlying these figures. Curiously, he professes wonder about any engines and drivers of economic, demographic, and other social trends. His only comment is to revive an outdated argument about whether economic progress is a pre-condition for fertility decline. (Recent evidence confirms a bi-directional relationship, with demographic change providing a "bonus" that provides opportunity and stimulus for accelerated economic and social progress.)

Our current understanding is less simplistic. Income effects alone are complex and situation specific. They are associated with (a) parental education and investments in children that lower desired family size, and also with (b) an increased ability to afford larger families. The effects

The Days of Our Lives

Life Expectancy at Birth, 1990-2025
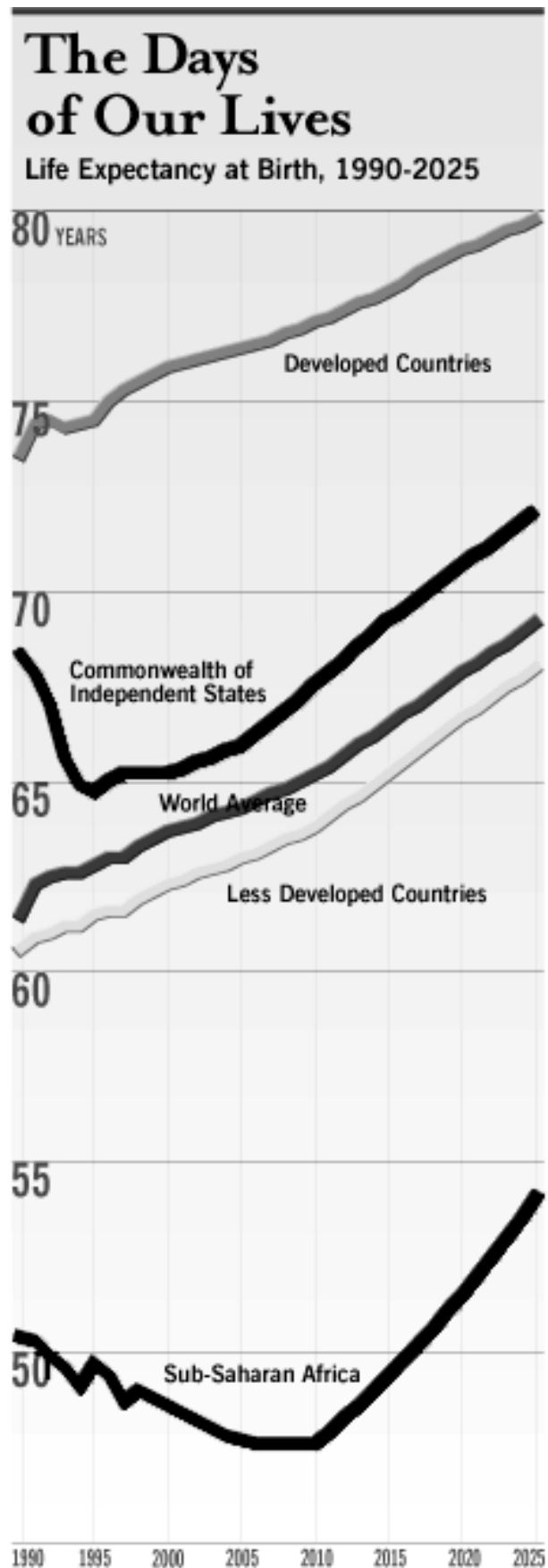
Source: "The Population Implosion," FOREIGN POLICY 123

of poverty on fertility declines are similarly complex. Important factors include: (a) desires to avoid further costs of children (especially increasing education costs); (b) the benefits from additional hands for subsistence work and resource scavenging; and (c) constrained access to the means to regulate family size. The calculus changes in different settings when the real and anticipated social costs and benefits from boys and girls are added to the mix. No wonder Dr. Eberstadt prefers to treat these issues as a black box that only produces one reduced fertility outcome. People who design national policies and programmes have no such luxury.

We know that a variety of factors interact to shape the development course of nations. No single element acts as a pre-condition, and deterministic causation is a will-o-the-wisp in the analysis of personal agency and social choice. Failure to find it should not hinder sensible policy. We do know what matters—not as deterministic tripwires, but as part of a dynamic of progress. These factors include: (a) declines in mortality (particularly infant and child mortality); (b) increases in women's education and social empowerment; (c) changing social norms; (d) increased discussion of family coping strategies (including family planning and education) in communities and within families; and (e) structural changes in societies that alter the rewards and costs both of variously-sized families and of investments in children's advancement.

Some of the historical examples that puzzle Dr. Eberstadt (e.g., Bangladesh and Kerala) are less puzzling when improvements in women's education, the strengthening of civil society organizations, and investments in health infrastructure (including reproductive health programs) are taken into consideration. Some of his statements on the role of tradition are also over-simplified, failing to understand that cultures adapt and provide meaning over time, not by "vigorous doctrinal gymnastics," but by elaborating their core values.

Projections also change as reality changes, responding to unfolding circumstances. The UN Population Division's most recent revision of projections to 2050 adds over 400 million people to the projections made just two years ago. Over 60 percent of this addition comes from slower fertility declines in 16 of the world's poorest countries. A small number of large countries account for the rest of the upward revision. This demonstration of uncertainty is an important antidote to clear narratives, but also is dwarfed by the levels of increase. By 2050, we will add over 3 billion people, nearly all of them in less-developed regions, presenting continuing challenges for public services, social infrastructure, economic development, and environmental quality. The projections

that lead Dr. Eberstadt to conjure up the specter of a "population implosion" include a tripling of the numbers living in the least-developed countries.

Some of the trends of declining fertility that underlie the projections are due to the significant investments made by sources as diverse as national governments, international assistance programmes, nongovernmental organizations, local communities, private enterprises, and individuals. Some of these investment trends remain positive; some have shown stagnation. As a result, it is likely that further upward adjustments in many of the population projections will occur, particularly in least developed countries. Concern has been increasing that supplies of reproductive-health commodities (for family planning, safe motherhood, and prevention and treatment of sexually transmitted diseases) are endangered. A meeting in early May 2001 was held in Istanbul as part of a process of stakeholder consultations to mobilize political commitment and the needed resources to (a) ensure greater choice in commodities and services, (b) improve their quality, and (c) advance integrated programmes.

The simple fact is that the challenges for the less-developed countries of the world remain multiple, serious, and simultaneous. Substantial technical and financial assistance will be needed to build conducive environments, to mobilize public and private resources, and to build partnerships in communities and families. Governments also need to improve their accountability and to address local priorities.

We cannot look dispassionately at total population numbers as though the people alive today are already well-served. Existing gaps and shortcomings are abundantly clear. For example, there are over 1,400 maternal deaths worldwide daily. More than one-third of all pregnancies globally are unwanted or unplanned. There is high recourse to abortion where family planning services are weak. 904,000 new cases of treatable sexually-transmitted diseases (half to men and women ages 15-24) are reported *daily*, as are 16,000 new cases of HIV/AIDS. We are not meeting the needs and guaranteeing the rights of millions of people now. We are also facing a 40 percent increase in reproductive-age populations in the coming two decades.

Adverse trends in international assistance most dramatically affect the poorest countries. After increasing during the ICPD process and its immediate aftermath, funds for population and reproductive health programmes have stagnated for several years. There is now growing interest in a global fund to combat HIV/AIDS. Increased funding from international donors, foundations, national authorities at various levels of

administration, the private sector, civil society, local communities, and people's pockets will be needed to strengthen education, health (including reproductive health) and other development initiatives.

Dr. Eberstadt tries to paint a picture of mortality and fertility trends combining to depopulate the world. We can sincerely hope that this vision motivates actions to counter negative trends, including: the erosion of public health programmes; declining public resource allocations

countless "unwanted pregnancies" across the world.

To the average person, simultaneous warnings about population implosion and explosion must be intriguing. The question, of course, is: which of these stories is true? Or indeed, are these stories mutually exclusive? And to the extent that they are not, what does Dr. Eberstadt's article suggest about those countries that are still experiencing population growth, and about the relevance of family planning programs in these countries?

> ## We cannot look dispassionately at total population numbers as though the people alive today are already well-served.
> ## —Stan Bernstein

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to health and education, particularly in times of social and economic crisis; and delays in improving and supporting public, private, and informal systems for old-age support. It is a mystery how any reading of current trends and needs can lead to a call for reversing decades of support to population and reproductive health programs and the progress they have spurred.

To a large extent, though, Dr. Eberstadt's view is biased from his vantage point in a highly-developed society. The problems of these societies, including those from changing age structures, are real and need redress. His portrait of some is greatly overdrawn. The demographic concept of "dependency," for example, bears no sensible relation anymore to the facts of people's lives. I will have more to say about the situation in more developed settings after we hear his response to the comments so far.

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Parfait M. Eloundou-Enyegue, Cornell University

No demographic news seems to be good news. Before having the opportunity to raise a glass to the end of the "population explosion," the world is now asked by Nicholas Eberstadt and others to brace itself for a "population implosion." The implications of this phenomenon are perhaps as ominous as the widespread famine and ecological degradation that was envisioned in the 1960s as an inevitable consequence of rapid world population growth. And as if this rapid pendulum swing were not dizzying enough, the public must also reconcile two divergent stories—one told by Dr. Eberstadt's article, and the other made up of those familiar accounts of

My view is that, while "The Population Implosion" provides a compelling account of the emergence of below-replacement fertility in many countries, this account is also consistent with both continued attention to rapid population growth in many countries and with a continued role for family planning programs. To reconcile these views, at least five distinctions are important. These include distinctions between (1) Western and world trends, (2) national and individual interests, (3) sufficient and necessary factors in fertility change, (4) a restricted versus an expanded view of family planning programs, and (5) demographic and political solutions. Each of these points is discussed below.

1. Western versus world trends

One main problem with Dr. Eberstadt's article is that it unnecessarily strains to cast a largely-Western story into a global story. While Europeans and an increasing number of other countries have indeed reached below-replacement fertility levels, this pattern is by no means universal. Even by generous standards, below-replacement fertility is found only among 44 percent of the world population. This is hardly a statistical majority, only an influential minority. One could haggle about the 44 percent figure, but this is a minor point (the threshold of 2.1 children would exclude some of the countries listed among below-replacement nations; in 1998, Sri Lanka and Tunisia were still listed at 2.1 and 2.2, respectively).

If sub-replacement fertility has "come close to describing the norm for childbearing the world over," as Dr. Eberstadt puts it, then that "world" certainly does not include Africa and many other countries in the Southern Hemisphere. Despite recent declines, fertility levels in Africa remain above four children per woman in most countries—the Kenyan story and a few other

exceptions notwithstanding. (The decline in the number of births per woman in Kenya over the last twenty years—from 7.8 to 4.6—is closer to three than to four.) It is likely that these declines in fertility will continue, but it is unclear how rapidly that will occur. The rate will depend in part on how fast the largely-urban changes in fertility spread to rural populations, which still constitute two-thirds of the sub-Saharan African population.

On the other hand, if one wanted to focus attention on worldwide trends, warnings about baby scarcity are premature. There are clearly enough babies to go around—they simply do not have the desired national origin. Again, the issue is not global but regional. In short, the article universalizes a Western story. While declines in national populations may become an issue for the rest of the world at some point in the future, many countries still deal with rapidly growing (rather than shrinking) populations.

2. National versus individual regulation

Population policy must deal with possible tensions between national interests and individual preferences. The shift from "explosion" to "implosion" in some countries may mean that, after decades of cracking down on prolific couples, policymakers may now seek to crank up individual fertility engines to suit new national priorities. The challenge is reversed, but the principle is unchanged. If one is committed to the idea that individual choices should supersede national goals, then a "laissez-faire" stance should apply equally to policies trying to curb population growth and to policies aimed at boosting fertility. "The Population Implosion" questions the "wisdom of the crusade to depress fertility around the world," but its attitude seems less hands-off when it comes to dealing with impending population implosion in Western countries. This is inconsistent—unless, of course, rapid population growth is more innocuous than the prospects of population decline.

One question is whether individual couples left to themselves would eventually redress the decline in Western fertility. Will strong economic incentives (or authoritarian measures) have to be devised? Another question for individual countries and the entire world is how low will be deemed too low. One could certainly survive in a world with a population half its current size. At the moment, concerns about "explosion" and "implosion" are largely national rather than individual obsessions. Most people around the world seem content with their fertility, except for the barren and the substantial number of mistimed and unwanted fertility cases in developing countries. One can argue that meeting these individual

goals (before national goals) is the first order of business. When individual goals are met, then policies to align behavior with national priorities are in order. At this point, the question becomes whether one knows enough about fertility motivation to understand if policies are likely to depress fertility or prop it up.

3. Sufficient versus necessary causes for fertility change

Dr. Eberstadt's article also suggests that the honest answer to questions about the factors that account for the worldwide decline in fertility is that "nobody really knows." This modesty is laudable but overstated. Not having a single, universal explanation for fertility decline does not mean that nothing is known; it simply means that known factors cannot be reduced to a single cause.

Among key factors that have contributed to reduce world fertility, one may include: (a) changes in the costs of and benefits of children, (b) infant mortality, (c) individual aspirations, (d) women's roles, (e) access to contraception, or (f) family organization. To induce a fertility decline, any of these factors may be sufficient, and none is necessary. Whether any given factor is important depends on the context and stage in the fertility transition. If a Nobel Prize is to be awarded for explaining the decline in world fertility, it will have to be shared by thousands of empirical studies on fertility determinants. Not having a single and obvious answer may be unsatisfying, but it is not an indication of cluelessness. As with any factor, the significance of family planning programs has been contingent on time and place. But in most recent cases, these programs have been critical in reducing fertility once the demand for them is present. This brings us to the next point: the continued role of family planning programs.

4. Restricted versus broad view of family planning

"The Population Implosion" is skeptical about the role of family planning programs, pointing out that notable changes in fertility have occurred in the absence of organized family planning programs. The obvious counterpoint is that an exception does not make a rule. As with any other factor or policy intervention, family planning is not a sine qua non. Yet it has played a special role in enabling change—once fertility aspirations begin to change.

More importantly, the potential role of family planning programs in developing countries has broadened beyond fertility limitation and into the realm of human

capital formation. The use of contraception contributes to improved reproductive health by (a) reducing the health risks associated with unsafe abortions and high-risk pregnancies, and (b) by shielding populations from the spread of AIDS. These health contributions alone are sufficient grounds to continue promotion of contraception.

In addition, family planning programs can help reduce educational inequalities, especially those associated with sex and large family size. Gender gaps in schooling have been closing steadily in the developing world as increasing numbers of families commit to equalizing educational investments among their children. In this context, reducing unwanted pregnancies among schoolgirls may become a more important contribution in closing the gender gap in secondary schools. Socioeconomic inequalities in schooling are also growing in many countries. While large family size had previously not been an impediment to schooling in many developing countries, recent research suggests that the educational and economic penalty associated with large family size is growing as schooling costs rise and as extended family solidarity erodes. To the extent that limited access to contraception partially contributes to the larger size of low-income families, family planning programs can significantly contain the growth in these educational inequalities.

5. Demographic and political solutions

A population implosion certainly raises new scientific and policy challenges. While the agenda of fertility research has exclusively been concerned with decline factors, the challenge now facing researchers may be to understand conditions that encourage couples to have a minimum of two children. In my view, Dr. Eberstadt is correct in noting that the "continuing preoccupation with high fertility has left the international population policy community poorly prepared to respond to the demographic trends emerging today." New theories and new empirical insights are needed.

At the same time, let us note that a demographic solution—migration—exists. Perhaps more than the demographic research community, national policy communities are the most unprepared to respond to current demographic trends in general and this solution in particular. Again, there are enough babies to go around today, and international migration would overcome the current "baby squeeze" in Western countries. Of course, this may not be a palatable solution for many governments. But neither would other scientific solutions that may be eventually be required—say in wage structure,

taxation, mandatory retirement ages. . .

The challenge is not so much to find new scientific solutions as it is to mobilize the political support necessary to implement new or existing solutions. As long as the specter of immigration remains scarier than the crumbling of social security systems (for instance), the viable demographic fix of migration will not be used. On the other hand, when declining population becomes a sufficiently compelling threat, known but politically unpopular policies will be enacted. Mandatory "two-children" policies may well be the result.

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Nicholas Eberstadt, American Enterprise Institute

Like all the other respondents in this forum, I too would like thank the Woodrow Wilson Center's Environmental Change and Security Project for graciously organizing this dialogue. Further, I am pleased that my essay in *Foreign Policy* should have provoked so much reflection, and stimulated such diverse contributions. Conversations such as this one are valuable not only for illuminating areas of contention or disagreement, but also—no less importantly—for dispelling misperceptions and identifying common ground.

Taken together, the text of the five preceding postings comes to over 6,500 words; that corpus of comments and critiques cover a wide swath of intellectual terrain. The authors also pose quite a few specific questions to me (Amy Coen alone has nearly a dozen), some of which invite extended, nuanced, and highly detailed replies. Rather than fully address each and every point the authors raise—to do so might require a small book!—I will attempt to attend to what I identify as their most pressing questions, concerns, and objections in a succinct manner, while raising some questions and concerns of my own in the process.

I should start by addressing a fundamental misapprehension of fact that seems to be shared by most of my interlocutors. The authors chide me for characterizing the current thrust of international population policies as anti-natalist. They imply—or assert explicitly— that my characterization is (at best) badly outdated. In particular, I am faulted for not appreciating the significance of the 1994 International Conference on Population and Development (or ICPD, also known as the "Cairo conference"), which (in Carmen Barroso's words) created a "consensus" in the population community that is "at

total odds" with what I termed "a crusade to depress birth rates."

I wish all that were so. Unfortunately, the facts speak otherwise. As anyone familiar with its deliberations should know, the Cairo conference resulted in a "Programme of Action" that is expressly anti-natalist: indeed, the policy interventions proposed in it are specifically justified on the basis of their perceived promise to depress Third World birth rates, and thereby slow global population growth.

The ICPD's secretary general, then-UNFPA Executive Director Nafis Sadik, could hardly have been clearer on this point. At the April 1994 Preparatory Committee for the ICPD, Dr. Sadik warned that "[w]orld population today is 5.7 billion. It will reach either 7.27 billion or 7.92 billion by the year 2015, depending on what we do over the next two decades"—meaning, of course, whether or not the international community would embrace the conference's anti-natalist population program.

The "Programme of Action" ratified by the Cairo conference unambiguously endorsed the principle of using population programs to reduce birth rates, and thus to staunch world population growth. To quote the fourth paragraph of the document's Preamble:

"During the remaining six years of this critical decade, the world's nations by their actions or inactions will choose from among a range of alternative demographic futures. The low, medium and high variants of the United Nations population projections for the coming 20 years range from a low of 7.1 billion people to the medium variant of 7.5 billion and a high of 7.8 billion…Implementation of the goals and objectives contained in the present 20-year Programme of Action…would result in world population growth during this period and beyond at levels below the United Nations medium projection."

Though Dr. Sadik's favored population target—no more than 7.27 billion persons by the year 2015—was not impressed upon the final Cairo text, the centrality of that target to the proceedings, and to the policies endorsed, was absolutely unmistakable. Thus the *New York Times* report on the conference and its "Programme of Action" ("U.N. Population Meeting Adopts Program of Action," September 14, 1994, A2) explained that:

"The aim of the declaration is to stabilize the world's population at about 7.27 billion by the year 2015—compared to 5.67 billion today—and avoid an explosion that could put the world's population at 12.5 billion in the year 2050."

There we have it. As officially enunciated, the ICPD "consensus"—the lapidary statement of purpose for current international population efforts—unequivocally aims to reduce current Third World birth rates and future human numbers; and includes specific, numerical targets by which to evaluate the success of the quest.

We may of course argue whether anti-natalist population policies are inherently dubious (my view) or inherently desirable (the view of many in the contemporary population movement). Either way, however, it is not tenable to object to the depiction of contemporary international population policy as "anti-natalist."

Another confusion shared by some writers concerns the explanation of past fertility trends and prediction of future population prospects. Many intellectuals no doubt entertain their own pet theories for why childbearing happened to decline in a certain place during a particular period—or, say, where fertility rates will be heading for a given country in the decades ahead. It is nevertheless essential to distinguish between subjective intuitions and surmises on the one hand and rigorous, robust, and generalizable results on the other.

With varying degrees of civility, authors in this forum criticize my article for being insufficiently attentive to current research and theories about fertility change. (In some instances, though, respondents perceive disagreements where none in fact exist: I would fully concur, for example, with Professor Eloundou-Enyegue's comment that "[n]ot having a single, universal explanation for fertility decline does not mean that nothing is known; it simply means that known factors cannot be reduced to a single cause.") Yet it is necessary to recognize the limits of our understanding of fertility change as a phenomenon, and the operational consequences that those limitations impose. For, plainly speaking, the fact is that we have no reliable basis for long-range projections of future fertility, and no methodology for explaining unambiguously sustained fertility changes from the past.

Why did fertility levels decline across Europe over the course of the Industrial era? Reviewing the contending theories of his day, and the evidence adduced for them, historian Charles Tilly put it well in 1978: "The problem is that we have too many explanations which are plausible in general terms, which contradict each other to some degree and which fail to fit some significant part of the facts." I do not believe any serious student of Western demographic history would take issue with that assessment today. But what obtained for Western countries with their demographic transition holds equally for the low-income regions here and now.

Just as we cannot unambiguously explain the fertility trends of the past, so we cannot confidently anticipate the long-term fertility trends of the future. As the UN

Population Division's 1997 Expert Group Meeting on Below-Replacement Fertility emphasized: "There exists no compelling and quantifiable theory of reproductive behavior in low fertility societies." The same, incidentally, may also be said for above-replacement-fertility societies.

For all these reasons, credulous declamations about the latest population projections for the year 2050 (of the sort that several authors in this forum have volunteered) are profoundly misguided. No science today can permit one to predict how many babies the now-unborn are going to bear a half-century hence. My *Foreign Policy* essay focused on the demographic horizon circa 2025 since— barring catastrophe—we can expect most of the people alive today to be living then, and most of the people in that future world to be already here, alive today.

But it is not possible for population projections made today to anticipate reliably either the tempo, or even the direction, of global population change some fifty years from now. Nor is that fact a closely guarded secret. The authors in our dialogue who draw attention to the UN Population Division's latest global projections neglect to mention that the UNPD releases not one but three so-called variants, all officially designated to be equally plausible—or that the "low variant" series imagines a world in 2050 in which total human numbers have already peaked, and are in the process of indefinite decline.

On a more immediate time horizon, deaths are poised to exceed births in the world's more developed regions. This is not a futuristic speculation, but rather an arithmetic reality. According to the UN Population Division's aforementioned assessment, that crossover might occur as soon as the year 2003—in other words, just a number of months from now. Thereafter, immigration could potentially forestall population decline for this grouping of countries—but no science today permits us to predict the immigration policies of tomorrow.

Here again: one may find the prospect of prolonged negative levels of natural increase for a consequential fraction of humanity to be inherently of interest (my view), or instead to be a matter of indifference (apparently, the view of some contemporary students of population). But denying or ignoring this prospect surely can serve no useful purpose.

Now to move on to some of the specific questions raised. Most concerned my assessment of family planning efforts in low-income countries, and my view of the appropriate role for the United States or international organizations in those activities.

To allay some of Dr. Coen's apprehensions: I did not write that government-run family planning programs is "a questionable investment"—that phrase comes from a caption added by the editors of *Foreign Policy*, not by me. Nor did I ever write that expenditures on international family planning programs were "unwise." If she rereads the passage in question, she will see that I argued the international "crusade to depress birth rates" is of "arguable merit." (Surely Dr. Coen can differentiate between a voluntary family planning program and an anti-natalist population campaign?) Finally, Dr. Coen's assertion to the contrary notwithstanding, I did not "point to Brazil as a model of a successful non-governmental

program." My precise words were: "Brazil has never adopted a national family planning program, yet its fertility levels have declined by over 50 percent in just the past 25 years." Perhaps she will enlighten us as to why those bare facts I adduced would lead her somehow to conclude that I viewed Brazil's programs as a "success"?

My perspective on the scope for and role of international family planning programs, not surprisingly, is shaped by my assessment of the determinants of fertility in the environs in which those programs are meant to operate. Two rather different views of fertility levels and their determinants in low-income regions coexist within the population community today. At the risk of

through voluntary family planning services surely have their place. (It is arguably a more prominent place today, given the mounting threat of HIV/AIDS and other STDs, than it might have been some decades earlier.) But in the final analysis, I see no persuasive argument for preferential allocation of public health funds to family planning over alternative health services. Judicious and effective public health policy requires a comprehensive weighing of cost and benefit—and in high-mortality settings, there are surely many other health interventions that must compete with family planning for the limited funds available. Note that this will remain true even if the overall health budget is substantially increased. Note

> It is not possible for population projections made today to anticipate reliably either the tempo, or even the direction, of global population change some fifty years from now.
> —Nicholas Eberstadt

some oversimplification, these two views can be characterized as "supply side" and "demand side" in orientation. The former holds that fertility levels in low-income societies could be significantly reduced by greater public provision of subsidized family planning services—since, in this view, there remains an enormous "unmet need" for such services among Third World populations. The latter maintains that the primary determinant of fertility levels in low-income regions is in fact the desired family size of the parents in question, and that family planning services will consequently have relatively little impact on Third World fertility levels—so long as those programs are voluntary rather than coercive in nature.

My own assessment comports very closely with the "demand side" interpretation. That is to say: I would argue that compelling evidence suggests desired or preferred family size is the best given predictor of actual fertility levels in low-income settings—and suggests further that the expected reductions in fertility to be achieved through the extension of voluntary family planning programs and the diminution of "unwanted" or "excess" fertility are generally rather modest.

Though I am skeptical about the demographic claims that have been advanced for voluntary family planning in low-income settings, I believe there is a strong case to be made for voluntary family planning programs on the grounds of health. Indeed, expected health benefits are in my view the legitimate rationale for public provision of family planning services.

Within the overall constellation of health problems in low-income regions, the afflictions that can be redressed

further that the cry of "unmet need" is not persuasive in redirecting funds toward family planning programs. (Low-income populations endure a panoply of "unmet needs"; "unmet need," indeed, is characteristic of the condition of being poor.)

Given some of the comments and questions posted, it may be apposite for me to emphasize at this juncture that I am no more partial to pro-natal population programs than I am to anti-natal ones. I do not personally favor pro-natalist polices in sub-replacement fertility settings, and never have. I would have thought my essay was perfectly clear in indicating that immigration should be a preferred policy instrument for dealing with some of the problems that might be exacerbated by prolonged sub-replacement fertility or incipient population decline. Evidently not.

Let me conclude by raising a question of my own—one arising from our dialogue here. It concerns the term "reproductive health." I fully recognize that, in the new linguistics of population policy, "reproductive health" is offered as the justification for the continuation—and, indeed, the expansion—of what are sometimes called "international population activities." Yet it is by no means clear to me that proponents of "reproductive health" agree on the meaning of the very banner they commonly champion.

In our dialogue, for example, Sonia Corrêa—a fervent promoter of "reproductive health"—argues that "[d]ecisions with respect to the spacing and number of children must be free of coercion and discrimination. They must be grounded in the respect of human rights

of involved persons." Amy Coen likewise extols the virtues of "expanding access to client-centered reproductive health services"—but at the same time celebrates the reproductive health "achievements" of governments that deny their subjects the most basic individual rights, including the right to determine their own preferred family size.

At the same time that my essay in *Foreign Policy* was coming out, Amy Coen was releasing Population Action International's (PAI) new study, "A World of Difference: Sexual and Reproductive Health & Risks." The study offers, among other things, a ranking of international "reproductive health" risks for women from 108 mostly low-income countries around the world (accessible electronically at http://www.populationaction.org/worldofdifference/rr2_risktable_frameset.htm).

Among the top ten countries in the aforesaid ranking of "reproductive health" risks are: China and North Korea. That's right: China and North Korea. China, the state that embraces coercive population control, including involuntary abortion and state-mandated postnatal medical infanticide against the mother's wishes. North Korea, the country in the grip of a state-made famine and society-wide mortality crisis—the precise spot on earth where ordinary citizens are perhaps the very least free to exercise rights of personal choice even during non-famine years. Believe it or not, in PAI's study, both China and North Korea were rated as enjoying better "reproductive health" than New Zealand!

Is Sonia Corrêa comfortable that she and Amy Coen mean the same thing when they proclaim the goal of "reproductive health"? Is North Korea generally viewed by other authors on this forum as a frontrunner among developing countries in the race toward "reproductive health"? How about China?

I realize that I have much to learn about what population activists mean by "reproductive health." Educate me.

▼

Stan Bernstein

When we began this discussion forum, I looked forward to an honest, open, and serious airing of views and an engagement of different perspectives. We all need to advance our education.

Dr. Eberstadt's response to our earlier submissions, however, leaves me disappointed and uncertain of both his openness and intent. Nearly seven years after the Cairo Conference he offers a serious (and I fear deliberate) misreading of the analyses, principles, and recommendations of the Programme of Action (PoA). I address a subset of the propositions and questions Mr. Eberstadt advances.

Is the Programme of Action "anti-natalist"? The first section of his reply argues that the PoA is an "expressly anti-natalist" document. His evidence for this conclusion consists of reference to a paragraph in the Preamble and a journalist's interpretation. From these he conjures "specific numerical targets" related to birth rates and human numbers that do not exist. The only quantitative goals relate to: (a) universal access to reproductive health services, (b) universal completion of basic education; and (c) reductions in infant, child, and maternal mortality rates. The UN General Assembly Special Session in 1999 added further benchmark indicators (for HIV/AIDS education and prevention, for quality and completeness of reproductive health services, for elimination of unmet need for family planning, etc.) to monitor the process of implementation.

Where does this purported agenda come from? The Preamble suggests that if the recommendations are implemented, fertility might proceed at below the medium variant projection. This did not reflect any anti-natalist agenda. The medium variant projection is regularly based on expectations from prior trends. The PoA's call for improved education, gender equality, reduced mortality, strengthened reproductive health services (and the integration of them into improved systems of primary health care) among other development strategies could not help but foster change. This is how demographic futures depend on "what we do."

Even if Dr. Eberstadt doesn't recognize this logic, I can speak from personal experience. I was involved in the process that led to that phrase. It emerged from analyses of unmet demand for family planning and the impact of addressing these desires on future fertility and future demand. Such calculations were needed for some of the resource estimates that were included in the PoA. This work reflected our state of knowledge based on past experience of supply and demand dynamics. It in no way set a target.

His final piece of "evidence" is a newspaper article stating: "The aim of the declaration is to stabilize the world's population at about 7.27 billion by the year 2015…." Those of us active in population work have long lamented the inaccurate understandings of demography by the press. Surely Dr. Eberstadt knows that stabilization of global population by 2015 could never have been intended or attained. Any demographer

(whatever their view of the levels, trends, or value of fertility) understands population momentum. His endorsement of this characterization is an abdication of a demographer's professional responsibility.

The description of comprehensive reproductive health programmes (in paragraph 7.6 of the PoA, too long to duplicate in full here) deserves more of Dr. Eberstadt's attention. It even includes the prevention and treatment of infertility (where appropriate to local circumstances and priorities, as in regions of Central Africa with high impacts of reproductive tract infections). Attention to the document as a whole would be a useful part of Mr. Eberstadt's continuing education.

The PoA does indeed in several places recognize various advantages to population stabilization. But it clearly recognizes stabilization as a side benefit of promoting consensus development goals, not as a guiding principle. The analysis rests on the understanding that people should be empowered to make their own choices, and the faith that this will lead to both individual and collective benefits.

A portion of the population community (to name a few: A. McIntosh, J. Finkle, P. Demeny, L. Lassonde and M. Wheeler) has even criticized the PoA in print because it failed to articulate demographic goals. I think these critics underestimate the wisdom and influence of empowered people that the PoA recognizes. But at least these critics faithfully read the lines of the document rather than impute hidden motivations between them.

If there is a problem with the PoA, it lies not in its conception, but in the pace of its implementation. Progress has been significant, but added resources are needed—financial, institutional, personal, and political.

What are the roles of explanations of fertility change and of population projections? There is no point in reiterating the points many of us have made about factors that contribute to fertility change. Dr. Eberstadt does not address the causal factors that many of us pointed to—education, gender equity, mortality reduction, information and service access, the economic and social context of fertility decisions, for example. Instead, he suggests that lack of consensus on mathematical relationships or the complexity of the causal web renders long-term projections unreliable.

We are all appropriately humble about long-term projections (the PoA restricted its horizon to 20 years), but we must make decisions in the present and mid-term. Demographic projections are more reliable over a longer term than those of economics and meteorology, and we constantly make behavioral adjustments based on those. Investments to address the causal factors

referenced will surely effect demographic, economic, and social trends for the better. Referring to "operational consequences that those limitations [i.e., in our understanding] impose" forecloses but does not enlighten the discussion. I would prefer it if Dr. Eberstadt had translated his concern into a call for investments in research, including operational research. In his earlier writings, he had expressed much greater confidence in UN demographic projections; his skepticism about their soundness has surfaced only after those projections have been revised upward.

Projections certainly do serve to alert us to future trends and expand the horizon of policymakers beyond short-term priorities. (I'll only mention in passing that the UNPD variants are not designated equally plausible; the medium has always been characterized as the "most likely.") A number of the participants in this discussion, for example, have already recognized the need for more-developed countries (and a growing number of developing countries) to address the challenges of changing age structures. Rather than denying or ignoring this prospect, we have discussed it. I refer Dr. Eberstadt and other readers to *The State of World Population Report 1998* ("The New Generations") for an extended discussion of the policy issues for addressing: (a) the largest cohort of adolescents ever; (b) the growing number of older persons; and (c) the implications of these changes (including for gender and intergenerational relationships). The issues in low-fertility settings concern policies regarding housing, education, employment, labor, pension systems, work-family relations, gender, and generational equity as well as immigration. These challenges are not met by denying real needs in many low-income countries, or by withholding donor support from efforts to assist them.

What is the role of reproductive health (including family-planning) programmes? Mr. Eberstadt recognizes that separating "supply" and "demand" views is an over-simplification. The dynamics of how these factors interact (and affect financial and social costs) is where the true story lies. Even in the area of family planning, his assertions fail to recognize the diverse role of programs (beyond public provision of subsidized services) in legitimizing discussion (even across barriers of age and gender), removing operational barriers, fostering markets, and ensuring equity. The issue applies as well to the full range of reproductive health services that the PoA supports. Would Dr. Eberstadt contend that slow progress in lowering maternal mortality and morbidity is largely a matter of "demand" factors rather than "supply" of services, and that programmes should not address both?

Market failures are common and substantial. Reliable and comprehensive information is not available (a condition for efficient markets) because a private firm won't make the needed investments if others may realize the returns or when the market is underdeveloped because potential clients are too poor. Decision-making is done by couples or families, and women (who bear the greater burdens and risks from unwanted pregnancies, unattended or complicated deliveries, sexually transmitted diseases, etc.) are too often denied a voice.

Intergenerational impacts also legitimate public concern and action. An unwanted pregnancy (whether it happens to a girl or her mother) can remove that girl from school, as can the death of a mother from HIV/AIDS or pregnancy complications. The social and economic impacts of failures to invest in health, including comprehensive reproductive health, affect the quality of life and the course of development of countries. Over half of the burden of disease afflicting women of reproductive age in developing countries is related to sex and reproduction. Significant externalities justify public expenditure.

The PoA recognizes that the true goal is comprehensive quality reproductive health care in the context of primary and higher level health care systems. Priorities among the components must be made on the basis of existing needs, existing capabilities, community demand, and the availability of efficacious interventions. Rather than rehearse arguments about the value of family planning (the World Bank has long recognized it as a cost-effective high-priority component of basic health-service packages), I would simply contend that it is a central component of overall reproductive health, particularly in light of both the extent of unintended pregnancy and sexual and reproductive diseases. Unmet needs for reproductive health services exact too large a social and personal burden to be glibly dismissed as part of the condition of being poor. Dr. Eberstadt's indifference to equity concerns conceals a profound insensitivity to the pain, suffering, and restricted opportunities of women, particularly poor women.

Though others might be better respondents, I also suggest that he misrepresents the Population Action International "reproductive health index." China (ranked 32th from the best), North Korea (34th), and New Zealand (35th) are in the Low Risk country category (25 countries are in the Very Low Risk category—admittedly, mostly wealthy industrialized countries). The Low Risk category is described by PAI as follows: "In most of these 35 countries, fewer than 1 in 20 teenage girls gives birth annually and women have, on average, fewer than three children. While almost all women receive care in pregnancy and childbirth, they are still five times more likely to die from maternal causes, on average, than are women in the Very Low Risk countries. Abortion is available on request in many of these countries. HIV prevalence is below 1 percent of adults in all but one of the countries in this category." Serious arguments could be made for different weights to the diverse elements of the profile that would shift the ordering within the useful broad categories. But Dr. Eberstadt's general mischaracterization is not analysis but polemics.

There is no "semiotic schism" about reproductive health. There is full unanimity (even, I would hope, with Dr. Eberstadt) on the importance of fully voluntary and informed choice, comprehensive services and women's opportunity and empowerment. Our efforts are directed towards that end with full respect for the letter and spirit of the PoA principles. I welcome his voice in helping hold countries accountable for programme failures, and hope he would also recognize progress in ensuring that basic rights are upheld and basic needs are met whenever and wherever it occurs. I regret his apparent contempt for the goals.

Carmen Barroso

I will address the issue of whether or not Cairo signaled a new approach to population policies, which is different from the "crusade to depress birth rates" Dr. Eberstadt so deplores.

The Cairo Program of Action offered a careful assessment of demographic trends and their implications, and these are presented in the context of sustainable economic growth and sustainable development. Furthermore, it does not establish targets, which had been misused in the past. The Program of Action asserts clearly the primacy of individual rights, reproductive health, and gender equity. Chapter II (on Principles) is based on universally recognized international human rights. Principle 4, for instance, states that "advancing gender equality and equity and the empowerment of women, and the elimination of all kinds of violence against women, and ensuring women's ability to control their fertility, are cornerstones of population- and development-related policies".

Numerous articles in the Program express the new reproductive health paradigm. Paragraph 7.3, for instance, says that reproductive rights "rest on the recognition of

the basic rights of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children, and to have the information and the means to do so, and the right to attain the highest standard of sexual and reproductive health." It also includes their rights to "make decisions concerning reproduction free of discrimination, coercion and violence. . ." Even fervent promoters of views which are in the minority among population experts should be able to differentiate between this language and anti-natalist population campaigns.

The interpretations that emerged soon after the adoption of the Program of Action were as revealing as the Program itself. There was a strong reaction against Cairo, coming from what Dr. Eberstadt would consider the anti-natalist camp. For some influential population professionals, the goals set by Cairo were irrelevant (or even counterproductive) for stabilizing population growth. Elaine Murphy (from Program for Appropriate Technology in Health) and Tom Merrick (from the World Bank) addressed these criticisms in a paper presented at the 1996 Meeting of the Population Association of America, and later published in the *Harvard International Review*. They tried to assuage the fears of anti-natalists by arguing that the holistic individual-centered approach of Cairo is a more effective strategy to achieve fertility reduction and other desirable development objectives. A less sophisticated person might even think that their argument reinforces the thesis that Cairo is, in fact, part of an anti-natalist campaign. But the compatibility between reproductive rights and fertility reduction does not mean anything more than that. A win-win correlation for many; a dubious situation only for those who espouse a pro-natalist ideology.

The real test of the Cairo approach is the degree to which each country is taking up the commitments contained in the Program of Action. Many national and regional assessments have been made, but there is still no comprehensive survey of all countries' compliance. Still, there are many encouraging signs—as pointed out, for example, by Francoise Girard in her analysis of Cairo +5 that was published in the Journal of Women's Health and Law. However, there is no doubt that there is much to be done. The reality on the ground in many places is light years away from our hopes. That is why we need to join forces with Dr. Eberstadt when he states that there is a strong case to be made for voluntary family planning programs on the grounds of health. Reproductive health afflictions have been under-appreciated and should be elevated above their current status because they are pervasive and debilitating in the lives of hundreds of millions of women. Beyond that, the women's

empowerment and anti-poverty agendas—both essential for effective enjoyment of reproductive rights—are also still very far from achieved. Rights-based population policies can help us move in that direction.

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Sonia Corrêa

Entering the forum debate for the second time, I want to thank Stan Bernstein and Carmen Barroso for their insightful contributions in clarifying the contents of the Cairo consensus, which have not been properly apprehended by Dr. Eberstadt. However, in addition to what has been said, I want to point out that at least one core element of the Cairo consensus also appears in Dr. Eberstadt argumentation. I am referring to the abandonment of simplified frames to explain the correlation between individual decision-making, economic dynamics, and demographic trends. This aspect has been previously addressed in the debate. But it seemed important to underline it at this further stage as another crucial component of the ICPD paradigm shift as well as a point of agreement among us in spite of many divergences.

Given that Mr. Bernstein and Dr. Barroso covered most aspects that I would like to raise, I want—as promised in my first entry—to briefly examine the "Brazilian case" that has been mentioned few times in this conversation. Starting with Dr. Eberstadt article, Brazil also appeared in Amy Coen's reference to distortions in contraceptive prevalence and the role of family planning organizations. It then appeared in my own first posting, which emphasized persistent gender inequalities as one factor explaining the distortions and gaps in sexual and reproductive health indicators. Carmen Barroso has, in addition, touched on the successful outcomes of Brazil's HIV-AIDS policy.

This recurrent quoting of Brazil is not surprising—after all, two Brazilians are involved in this conversation. And the country's rapid fertility decline in the absence of a population control policy has puzzled demographers since the 1980s. However, as is often the case in international debates, the interpretation of what happened is contradictory and inaccurate. I am afraid that the bits and pieces raised here may add to the confusion. Rendered accurately, the Brazilian case may illuminate some of the core issues under debate.

Among the many authors that scrutinized the Brazilian demographic transition, Faria (Faria V. (1989). "Politicas

de governo e regulação da fecundidade." *Ciências Sociais Hoje, Anuário da antropologia, política e* sociologia. São Paulo: Vértice Editora.) remains as the landmark point of reference. He interpreted the "surprising" fertility decline as the non-anticipated outcome of a few policies implemented during Brazil's military régime (1964-1985): (a) the expansion of the health system and consumer credit; (b) wider social security coverage; and (c) expansion of communication systems, particularly television. Together with rapid urbanization, these policies led to a preference for smaller families. Feminist analyses have enriched Faria's frame by including gender. Since there was (and still is) a strong male reluctance to use contraception, women became the agents of the transition.

From the early 1970's on, female demand for contraceptive methods skyrocketed. But until 1985, the public health system did not offer contraceptive assistance. Consequently, the demand was "responded to" by non-governmental family planning agencies and, predominantly, by the market. On the "good side" of this early picture, women learned—from both the family programs and the drugstores—that is was possible to regulate fertility. On the "bad side," the lack of information and the bad quality of family planning services discredited reversible methods.

Although marginal in quantitative terms, the role of Brazil's nongovernment family-planning system in favoring this culture of discredit was not irrelevant. In a context where abortion is illegal and reversible methods "did not work," women rapidly moved towards a "preference" for sterilization. In absence of a clear public policy, female sterilization started being offered by various schemes (direct payment to doctors and exchange for votes in election periods). These trends were already identified by the early 1980's when, under the pressure of the women's movements a national women's health program (PAISM) was formulated. Its frame and contents anticipated ICPD's PoA by ten years.

But implementation of PAISM was slow and problematic. It was affected by political and institutional instability and by the delay in implementing the public health system—as defined by the 1988 constitution (SUS). Most principally, it has taken much time and advocacy to persuade Brazilian policymakers and health managers that it was strategic to invest in women's sexual and reproductive health. In the second half of the 1990's, however, clear progress has been made with respect to pre-natal care, obstetric assistance, and access to abortion in the case of rape and risk of life. In 1997, a family-planning law was adopted, establishing clear norms for sterilization procedures. But the distortions in contraceptive

prevalence (and high percentage of C-sections associated with sterilization) crystallized by ten years of policy delay are not so easily deconstructed.

Brazil's STD-HIV-AIDS program is partly a result of PAISM as well as the result of civil society pressures on the Ministry of Health. Having started later (in 1988) than PAISM, however, the STD-HIV-AIDS program benefited from a more functional public health system. Most importantly, this program was quickly given high priority by both the Brazilian government and international agencies. Since 1993, the policy has also been financially supported by a World Bank loan that ensures its institutional infrastructure, as well as by investments in the NGO sector working in advocacy and prevention.

What might explain the imbalance between the two policies in terms of priority and funding? The first is the strikingly lethal impact of HIV-AIDS; gaps in reproductive health mostly result in morbidity that is not easily measurable. But it is also crucial to remember that ineffective reproductive health policies basically affect poor women, while the HIV-AIDS pandemics impacts on both men and women and cuts across classes and income levels. One clear effect of this imbalance is that there was not, until very recently, even any collaboration between the two programs. Of course, the prevalence of female sterilization does not facilitate the prevention of HIV-AIDS among women, whose levels of infection skyrocketed the last ten years (most principally among married women).

What lessons can be drawn from the Brazilian experience? The first is that the market is not the best solution to respond to sexual and reproductive health needs; as Stan Bernstein has pointed out, it often fails. The implementation of consistent and effective sexual and reproductive policies requires policy prioritization, public funding, and a comprehensive approach. The Brazilian case speaks strongly against narrow and vertical programs, even if they are broader than family planning. It illustrates the relevance of consistently integrating sexual and reproductive health and health sector reform agendas, as recommended by the Cairo+5 final document.

Secondly, the Brazil case also suggests that a slow pace in policy implementation crystallizes distortions that are difficult and costly to be corrected. Donor countries that are not complying with their financial commitments as well as recipient countries that are not persuaded of

the relevance of the Cairo agenda should be aware of this. Lastly, the Brazilian story also indicates that, even when the political atmosphere is favorable, is not easy to raise women's needs and a gender perspective to high policymaking levels. But it also tells us that when civil society voices are taken into account as early as possible in the policy process, the chances are greater of achieving a better policy outcome.

I want to end by responding to the queries Dr. Eberstadt posed directly to me. I will not extend myself with respect to my interpretation of sexual and reproductive health, as this has been brilliantly done by Carmen Barroso and complemented by my own views on the Brazilian experience. However, I want to react to the question raised about a potential divergence between my own and Amy Coen's perspectives.

It seems clear that both Dr. Coen and I are in full agreement in regard to women's empowerment and great priority to sexual and reproductive self-determination. But I will certainly disagree with Dr. Coen's position if she is advocating that these broad premises be narrowed down into simply "more funds to family planning." This move would take us back to the immediate post-Cairo controversies so well described by Carmen Barroso (translated, "given the scarcity of resources, lets get back to the well-known family-planning agenda"). And this recurrent tendency to trim down the Cairo agenda is to a large extent determined by the U.S. political climate. I can understand why, under the morally conservative rule of George W. Bush, U.S.-based organizations would do whatever they can to retain financial resources for the so-called population field. However, we will not do justice to the global nature of the ICPD "consensus" by adjusting it now and then to North American political conjunctures.

Finally, I think the major problem we face globally is not scarcity of resources per se but rather the challenge of a skewed distribution of resources—between men and women, between North and South, and between the private and public sectors. It may take long to redress this imbalance. But making efforts in that direction is also an integral part of the ICPD PoA (Chapter III). Moreover, in the course of the last 25 years of struggling for gender equality, we have also apprehended the meaning of historical patience. We can wait. **W**

THE POPULATION, ENVIRONMENTAL CHANGE AND SECURITY FELLOWSHIP

A collaboration of the University of Michigan Population Fellows Program and the Environmental Change and Security Project of the Woodrow Wilson International Center for Scholars

The Population, Environmental Change, and Security (PECS) Fellowships are two-year professional assignments for individuals with advanced degrees in PECS-related areas. The fellowships aim to:

1) **develop a cadre of future leaders with expertise in these areas;**
2) **provide technical assistance to organizations addressing security from an interdisciplinary perspective;**
3) **facilitate research, dialogue, and analysis of long-term security issues at the nexus of population and environmental change.**

Providing Unique Interdisciplinary Expertise to Diplomatic, Security, and Development Organizations

The Population Fellows Program, administered by the University of Michigan's Center for Population Planning and funded by the U.S. Agency for International Development (USAID), has recently developed a new type of fellowship with support from the Woodrow Wilson Center's Environmental Change and Security Project. The Population, Environmental Change, and Security Fellowship combines the strengths of both programs in addressing critical aspects of evolving international security concerns. The fellowship draws on the Population Fellows Program's 15 years of experience arranging fellowships with organizations working on population and population-environment issues in the developing world. It also draws on the tremendous policy-level expertise of the Woodrow Wilson Center in the area of environmental change and international security.

The PECS Fellowship will provide a rich professional development opportunity for an early-career professional with graduate training and expertise in the linkages among population, environment, and security issues. The fellow will be placed for two years with an organization exploring these linkages through research, inter-institutional dialogue, case study preparation, and policy analysis.

Fellows as Innovators

Because the PECS Fellowship is a new initiative, we will work closely with diplomatic, security, and development organizations interested in hosting a fellow to formulate a scope of work that will challenge the fellow and have a meaningful impact on each organization's mission.

If past fellowships are any guide, we expect our PECS Fellows to serve as important catalysts for innovation within their organizations. Our traditional Population and Population-Environment Fellows have served a variety of organizations in this capacity – from local Ministries of Health and nongovernmental organizations to larger organizations such as CARE, Save the Children, USAID, the U.S. Department of State, World Wildlife Federation, The Nature Conservancy, United Nations Population Fund, the Centers for Disease Control, and the World Health Organization. These fellows have spearheaded such projects as institutionalizing reproductive health care for refugees and initiating community land-use planning processes to mitigate the environmental impact of rural migration.

Applying for a Fellowship

Candidates wishing to apply for a PECS Fellowship must meet the program's minimum qualifications:

- U.S. citizenship or permanent resident status; and
- a graduate degree in a relevant area, plus expertise in the linkages among population, environment, and security issues.

Furthermore, candidates must be early-career professionals (with no more than five years of post-master's experience); possess appropriate technical skills and knowledge; and show evidence of a commitment to a PECS-related career. To demonstrate this, candidates are asked to submit the following:

- an official program application form;
- a resume;
- a statement of purpose;
- academic transcripts;
- Graduate Record Examination scores;
- three letters of recommendation;
- a recent writing sample; and
- an official foreign language evaluation (optional).

If you are interested in applying for a PECS Fellowship, please contact Mita Gibson at the number on the following page. We will happy to review your credentials and discuss the application process with you.

Host Agency Responsibilities

Because fellows bring so much to the organizations they serve, we ask potential host agencies to consider carefully the type of experience they could provide for a fellow.

Are you an appropriate host organization?

We ask that potential host agencies be able to identify a meaningful PECS-related project a fellow could accomplish in our customary two-year placement period. Furthermore, because this is a development program for early-career professionals, the organization must be able to offer an experienced, committed mentor who will collaborate closely with the fellow and help advance his/her expertise.

Can you provide for some of the fellowship costs?

We attempt to be as cost-effective as possible in structuring our fellowships while providing sufficient support for fellows' professional and living expenses. In general, a fellowship provides the following:

- a modest professional stipend;
- health and emergency evacuation insurance;
- travel to and from the placement site;
- limited shipping expenses; and
- assistance with housing and cost-of-living adjustments, where applicable.

Through the years, the Population Fellows Program has arranged for various cost-allocation arrangements with host agencies. In some cases, the host agency has paid for a significant portion of a fellow's expenses; in others, the Fellows Program has provided the bulk of financial support. Most common is some form of cost-sharing in which the host organization provides several of the following:

- work-related travel expenses;
- housing and/or cost-of-living adjustments;
- necessary office equipment (computer, typewriter, etc.) and supplies; and
- access to support staff.

We should note that the more support provided by a prospective host organization, the more likely it is that a fellowship will receive program approval.

Requesting a Fellow

If you believe your organization could provide valuable experience for an early-career professional while better achieving your own organizational objectives, we encourage you to contact us. A phone conversation is often the best way to determine whether your organization is a good "fit" with our program. If it is, we will ask you to complete a Letter of Intent/Scope of Work formally requesting a fellow. This should include the following:

Contact information

How to reach your organization, whom to contact, and who will supervise the fellow (contact information and credentials).

Organizational information

What you do, where your projects are located, why you are requesting a fellow, and any other information that would help us identify an appropriate candidate for you.

Potential support

The level of support (financial, material, and/or staff support) your organization would be able to provide for a fellow as well as the cost of living in your area.

Scope of work

The 2- to 3-page scope of work identifies:

- the projects on which the fellow would work and the role   s/he would play in them;
- the level of independent responsibility expected;
- the qualifications required (including languages);
- a flexible timeline for placing the fellow (fellowships can take several months to arrange).

Before preparing these documents, please contact us to discuss how we might structure a placement that will help your organization explore the critical links among population, environmental change, and security.

Mita Gibson
University of Michigan Population Fellows Programs
1214 South University Avenue, 2nd Floor • Ann Arbor, MI 48104
Phone: 734-763-9456 • Fax: 734-647-0643
E-Mail: popenv@umich.edu
Internet: http://www.sph.umich.edu/pfps/

For more information on population, environmental change and security issues, see the Woodrow Wilson Center's Environmental Change and Security Project's Web site at: http://ecsp.si.edu.

SPECIAL REPORTS

THE LINKAGES BETWEEN POPULATION AND WATER: FORTHCOMING ARTICLES FROM ECSP

By Shanda Leather

Population growth as well as the demand for and scarcity of clean water are all dynamics that stress the capacity of governments and societies to (a) provide basic services and (b) maintain a healthy human and natural environment. Neither population growth nor water supply, however, can be considered in isolation. Human usage puts the most consistent stress on water resources; in turn, the scarcity or misallocation of water resources greatly affects the well-being of human populations and natural ecosystems. In collaboration with the University of Michigan Population Fellows Program, the Environmental Change and Security Project (ECSP) commissioned in fall 2000 a series of articles to examine global and regional linkages between population and water. The interplay among these issues is at the heart of this project.

Each of the three articles (summarized below) has been jointly written by a pair of authors, representing both a Northern and Southern perspective. Each article also draws on regional case-study material. Rather than revisit the widely-researched area of water shortages and potential conflict in the water-scarce Middle East, we chose to expand the population-water discussion by focusing on Southern and East Africa, India, and the Philippines. It was also our goal in commissioning these articles to promote cooperation between the authors— allowing them to work collaboratively, to share concepts and experiences, and to bring that collaboration to a wide audience through the ECSP network. Since the opinions and work of Southern authors are not widely featured in North American publications, we also wanted to raise the profile and exposure of those with direct experience of these issues in developing countries.

THE COMING FRESH WATER CRISIS IS ALREADY HERE
by Don Hinrichsen and Henrylito D. Tacio

Don Hinrichsen *is a writer/media consultant and fundraiser for the Untied Nations Population Fund in New York. He has written five books over the past decade on topics ranging from coastal resources to an atlas of the environment.* **Henrylito D. Tacio** *is a Filipino journalist who specializes in science and the environment.*

In "The Coming Freshwater Crisis," Hinrichsen and Tacio assert that demand for fresh water is outstripping the ability of many governments to supply it. The authors look broadly at global trends in population growth and fresh water availability, highlighting areas that are already at crisis stage and looking toward those areas that will soon present difficulties. Their discussion sets the stage for some of the more in-depth topical discussions in the subsequent articles.

Hinrichsen and Tacio outline the global dynamics of (a) population and fresh water, (b) fresh water availability, and (c) fresh water use before moving on to a lengthy discussion of what they term "a future of scarcity"—an accelerating demand for fresh water accompanied by its declining per-capita availability:

> "...[Global] demand for water is rising not only because of population growth but also because of urbanization, economic development, and improved living standards. Between 1900 and 1995, for example, global water withdrawals increased by over six times, more than double the rate of population growth."

> "Since 1940, annual global water withdrawals have risen by an average of 2.5 to 3 percent a year while average annual population has grown 1.5 to 2 percent. In developing countries, water withdrawals are rising more rapidly—by 4 to 8 percent a year for the past decade—because of population growth and increasing demand per capita.

> "Moreover, the supply of fresh water available to humanity is in effect shrinking because many fresh water resources have become increasingly polluted. In many countries, lakes and rivers are used as receptacles for a vile assortment of wastes— including untreated or partially treated municipal sewage, industrial poisons, and harmful chemicals

leached into surface and ground waters from agricultural activities…"

Hinrichsen and Tacio emphasize how developed countries have a much-higher per-capita water usage (and thus greater demand) than developing countries. Low household use in developing countries also reflects the difficulty many people have in obtaining clean water. However, the authors are quick to point out that this pattern is changing dramatically, as countries become predominantly urban and demand for piped water increases. Through this, Hinrichsen and Tacio lay the groundwork for a discussion of intersectoral competition that is more thoroughly dealt with in the second article.

Finally, Hinrichsen and Tacio examine the degradation of water supplies and the effect such degradation has on increased demand and consumption. Pollution (both agricultural and industrial) is a problem faced by developed and developing countries alike. As pollution continues, current sources of clean water either will become unusable or will require clean up at great cost to either governments or consumers. All of these issues are vividly highlighted in the article's case study from the Philippines. Authoring the case study, Tacio details examples from throughout the archipelago to illustrate the trends of inadequate supply, polluted sources, and lack of access—all in a country that, as one of the wettest in Southeast Asia, is commonly perceived as water-rich.

Water Crisis: The Case of the Philippines

"…The country's water is supplied by rainfall as well as rivers, lakes, springs, and groundwater. With changing weather patterns worldwide, rainfall is growing scarcer. The little that comes from the heavens is collected, or wasted, in watersheds with balding forests. As a result, there has been a dramatic drop of from 30 to 50 percent in the country's available stable water resources in the past three decades.

"A recent report released by the Philippines Department of Environment and Natural Resources (DENR) said that 90 percent of 99 watershed areas in the country are "hydrologically critical" due to their degraded physical condition. Massive destruction of the once-productive forested watersheds by illegal loggers and uncontrolled land use from mining, overgrazing, agricultural expansion, and industrialization have contributed to water depletion.[1]

"Worse, excessive soil erosion is hastening the destruction of watershed areas. The DENR report stated that 36 of the country's 75 provinces in the country are severely affected by soil erosion. Two provinces—Cebu and Batangas—have lost more than 80 percent of their topsoil to erosion. In Luzon, the four major basins—Bicol, Magat, Pampanga and Agno—are in critical condition due to acute soil erosion and sedimentation.

"River pollution also contributes to the country's current water problem. Out of 418 rivers in the Philippines, 37 have been classified as polluted, while the rest are seriously polluted. The DENR's Environmental Management Bureau listed 11 rivers that are considered "biologically dead." Water pollution is mainly caused by domestic wastes, which account for 52 percent of the pollution load. Industry accounts for 48 percent.

"There is more bad news. Water levels in the country's major sources have been dropping at the rate of 50 percent over the past 20 years. Excessive pumping of groundwater has caused water depletion and consequent decline in water levels.[2] In less than 20 years, water levels in wells have dropped from an average of 20 meters below land surface to more than 120 meters in some areas, particularly in the industrialized areas of Paranaque and Taguig, both in Metro Manila…"

Urbanization and Intersectoral Competition for Water
by Ruth Meinzen-Dick and Paul P. Appasamy

Ruth Meinzen-Dick *is a Senior Research Fellow at the International Food Policy Research Institute. She has conducted extensive research on a wide range of issues related to water management, property rights, collective action, and gender analysis, especially in South Asia and Southern Africa.*

Paul P. Appasamy *is Director, Madras School of Economics, Chennai, India. He has spent the last three decades studying and working in the areas of water resources and urban development.*

While human populations 100 years ago were primarily rural and agriculturally- based, humans are

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Shanda Leather is the former deputy director of the Environmental Change and Security Project.

Figure 1. Urban and Rural Population in Millions, 1950-2030
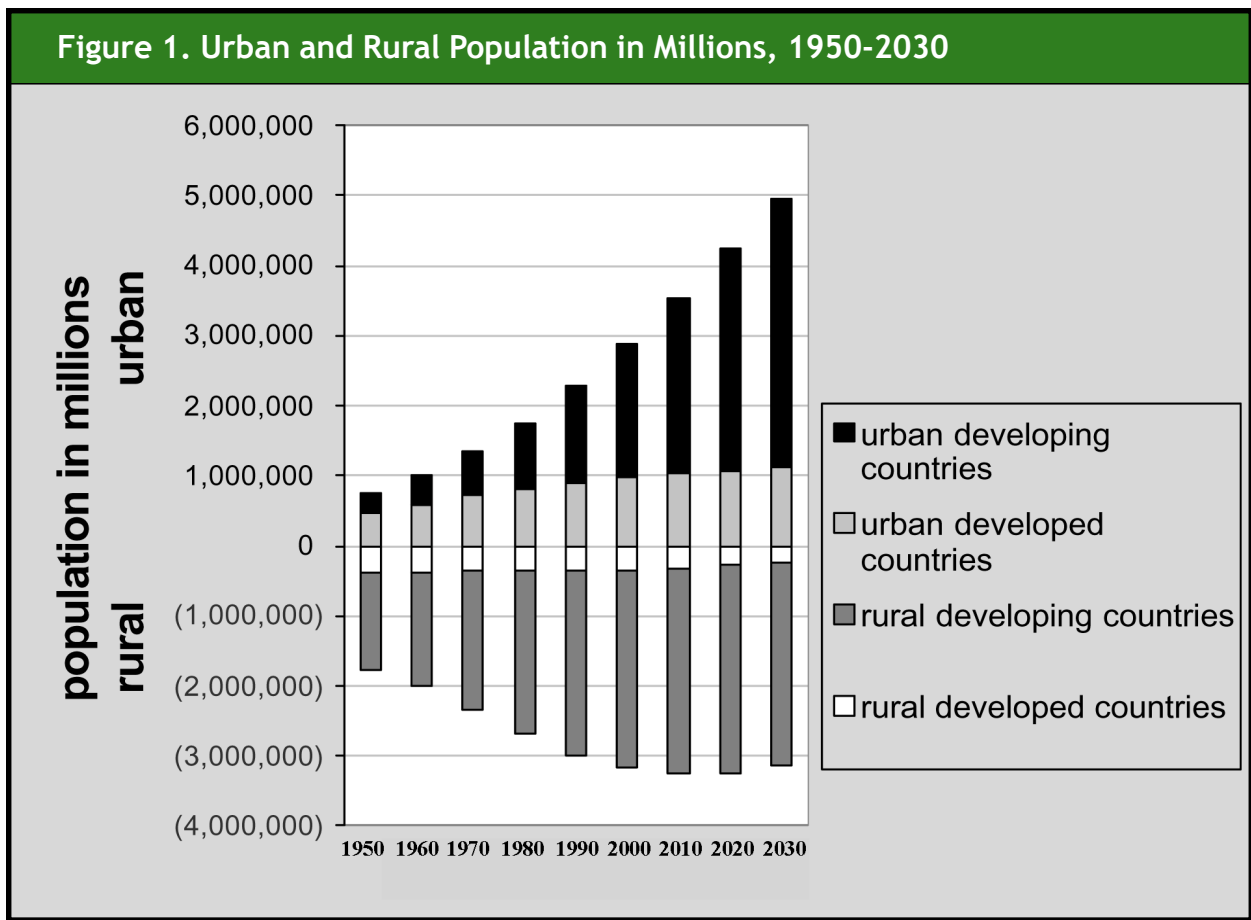
Source: Data from FAO STAT (2000).

rapidly becoming a predominantly urban species. More than half of humanity now resides in urban areas. This trend brings with it a shift in demand for and use of water resources. While agriculture still accounts for the largest volume of fresh water use, the percentage of fresh water now used to supply activities in urban areas has vastly increased. These rising urban demands means that water must be reallocated from agricultural activities to industrial and urban household usage. Authors Ruth Meinzen-Dick and Paul Appasamy take up this issue of this allocational intersectoral competition by exploring the dramatic demographic trend toward global urbanization and its effect on the distribution of and competition over water resources.

Worldwide, urban populations have grown by more than 2 billion since 1950, and are anticipated to grow by that much again in the next 25 years. (See Figure 1.) Two of the largest challenges to supporting this urban-based population are (1) the provision of water, and (2) the treatment and disposal of water-born waste. Meinzen-Dick and Appasamy point out that such provision is not a problem at an aggregate level: urban water use still

makes up a fraction of that used for agriculture. However, highlighting a theme seen over and over in these articles, the authors argue that it is (a) the provision of water *when and where it is needed* as well as (b) *the quality of what is supplied* that pose the greatest problem. Meinzen-Dick and Appasamy probe not only the technical and economic implications of urbanization and intersectoral competition, but also the social and political implications of this trend:

- "…Domestic water demand is not simply a multiple of the population size. Per-capita demands increase with urbanization and rising incomes. Rural water supply systems in India, for example, use a norm of 40 liters/capita/day for domestic use without household piped connections (where it is assumed that other water sources can be used for bathing and washing clothes). This rises to 70 liters/capita/day for urban areas with piped water supply but no underground sewerage, and then to 125 liters/capita/day for urban areas with underground sewerage (as in

most major cities).[3] These norms refer to basic levels; water demand can rise even further with rising incomes. Residential use in Europe averages around 200 liters/capita/day, and in the United States, 400 liters/capita/day [4]…"

- "…Even in cities that have high average domestic water consumption, many people are not adequately served by municipal supplies, especially in slums and peri-urban areas. A study in nine East African cities found that, from the late 1960s to the late 1990s, the proportion of households with piped water at their homes and the availability of water in the municipal systems

are guaranteed a reliable and safe supply. Meinzen-Dick and Appasamy argue that, since water is vital to life and livelihoods, the provision of water is critical to the social stability and political legitimacy of governments. Understanding the power relations of the stakeholders is essential to understanding intersectoral competition and water allocation in any given situation.

Finally, the authors move through a well-structured explanation of the various users within a water system (and their relative positions of power) before outlining various options for meeting urban water needs. Many of these options require either (a) transfer of supply and power from one sector to another, or (b) compromise

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Negotiated approaches that allow farmers to (a) voluntarily reduce water use, and (b) profit from transferring water to cities are likely to cause less resistance and less loss of livelihoods in rural areas.

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both decreased…

- "…Beyond domestic water needs, water is an input into the economic development process. Industrial production requires water, although the exact amount varies, depending on the industry and the technology used…Agriculture is the largest water consumption sector worldwide—and especially in developing countries. Irrigation has been and will continue to be critical to achieving food security. Worldwide, irrigated agriculture contributes nearly 40 percent of total food production on 17 percent of the cultivated area. Irrigated production contributes over 60 percent of the food in India, and nearly 70 percent of the grain in China (Rosegrant and Ringler 1998)…[5]

- "…Stereotypical images of 'thirsty cities' that equate urban demand with 'drinking water' or factories and rural water supply with irrigation do not adequately represent the water uses in each area. Domestic water supply is also needed in rural areas. With rural industrialization, factories increasingly draw water (and discharge wastes) in rural areas. Nor should the water uses of urban agriculture be overlooked."

Meinzen-Dick and Appasamy go on to discuss thoroughly the different economic values of water and to examine the various ways water resources are allocated among these demanding sectors. Research indicates that all users—even poor domestic consumers—are willing to pay for water in one way or another, as long as they

on the part of several sectors. These are political decisions, influenced by the power and legitimacy of governing bodies. However, as Meinzen-Dick and Appasamy detail, there are also possibilities for mutual gain:

"…A closer look at water *uses* shows that domestic, agricultural, and industrial water uses are all found in both rural and urban areas (though in different concentrations). A closer look at water *users* indicates that households may have interests in many different water-using activities. Appropriating water from existing rural uses for transfer to cities and industries may cause resentment. Negotiated approaches that allow farmers (a) to voluntarily reduce water use, and (b) profit from transferring water to cities are likely to cause less resistance and less loss of livelihoods in rural areas.

"Both economic progress and the stability of governments depend on meeting the water needs of rural and urban as well as peri-urban areas. This will require substantial investments in urban infrastructure for water supply, treatment, and disposal. At the same time, very few places will be able to meet unchecked urban water demands. Therefore, demand management will also be necessary. Pricing, which has received considerable attention as a means of demand management, is only one tool and may not be very effective without complementary education campaigns, leak detection, retrofitting, recycling, and other technical improvements.

"Providing water in an efficient, equitable, and sustainable manner to both urban and rural areas in the 21st century poses as much an institutional as a technical challenge. The ad hoc and sectoral approaches of the past are not adequate for the interrelated nature of urban water use. To meet urban water needs, water institutions must expand their vision in at least two directions: (a) to extend services to low income communities and peri-urban areas, and (b) to protect the quality of surface and ground water…

"…Finally, dealing with the water needs of the poor (who may make up one-third of the urban population) requires far greater efforts. Meeting these needs is an effort likely to go beyond conventional engineering approaches to include a wider range of options for water supply and sanitation. It also requires rethinking institutional approaches (such as thoroughly involving community organizations in decision-making as well as implementation)…"

EXPLORING THE POPULATION-WATER RESOURCES IN THE DEVELOPING WORLD
by Anthony R. Turton and Jeroen F. Warner

Jeroen F. Warner *is currently completing a PhD on images of water security at Middlesex University, U.K. He is also the research coordinator for the International Multi-Stakeholder Platforms project at Wageningen University's Irrigation and Water Management group.*

Tony Turton *heads the African Water Issues Research Unit at Pretoria University in South Africa. A political scientist by training, he has a specific interest in water as an element of economic growth and development in Southern Africa.*

This theme of new approaches to water scarcity and water management is picked up in the final article in the series, authored by Anthony Turton and Jeroen Warner. Turton and Warner begin by defining their approach to the concepts of scarcity, resources, and legitimacy—bringing some highly useful nuances to these terms.

One of the most important and interesting discussions in this article is the development of a "resource matrix." The authors expand on previous work done by Leif Ohlsson, who termed a "first order" resource as any natural resource and a "second order" resource as a society's ability and willingness to deal with scarcities of a first order resource. Turton and Warner adapt these terms to develop their "resource matrix," which displays a variety of resource combination possibilities for countries

Figure 2. Turton and Warner's Resource Matrix

| | | **Type of Resource** | |
		First-Order (Water Resources)	**Second-Order** (Social Resources)
Quantitative Aspect of the Resource	**Relative Abundance**	Position 1	Position 2
	Relative Scarcity	Position 3	Position 4

according to their natural water supply and their ability to effectively use that supply (see Figure 2).

Societies that are in positions 1 and 2 have relative abundance in both first and second order resources, while those in positions 3 and 4 have scarcity in both areas. A key additional element of Turton and Warner's analysis is that the rate of population growth has a great effect on both natural and social resource availability.

Using three variables (natural resource availability, social resource availability, and population growth rates), Turton and Warner go on to develop a unique and informative discussion of the positions of various countries in their study areas of East and Southern Africa. These countries fall into three categories: (1) Structurally-Induced Relative Water Abundance (SIRWA)—*social abundance but water scarcity*; (2) Structurally-Induced Relative Water Scarcity (SIRWS)—*water abundance but social-resource scarcity*; and (3) Water Poverty (WP)—*scarcity of both water and social resources*. The reasons for the positioning are complex, but some preliminary analysis shows commonalities that have fundamental implications for water management. Table 1 presents the classification of the countries in the study area and the authors' explanatory text.

Turton and Warner detail the nuances of each country's situation:

". . .Southern Africa has a spread of cases from all three categories, with all results corresponding with what is known about each country. The three cases

that are classified under SIRWA are known to be the most prosperous countries in the region. (Should data have been available for Seychelles, then this country would probably also fall into this category.) For these countries, the water-related problems are primarily of a first-order nature—namely, the continued search for and mobilization of alternative sources of water supply. Given the relative economic prosperity of these countries, the range of options is wide, covering: (a) supply-sided solutions (development of ever more distant water resources via International Basin Treaties and desalination where appropriate); and (b) management of demand and the importation of Virtual Water (water imported into a country in the form of grains or other foodstuff—the final products of water usage rather than the water itself) in an attempt to balance the national water budget. All three strategies are known to be taking place at present. The role of Virtual Water trade as a critical component of a strategic water management strategy for these countries is only recently becoming known (Turton et al., 2000b).

"The five cases that are classified under SIRWS are all countries that ostensibly have an abundance of water but that lack the institutional, financial, or intellectual capital to translate this into economic growth and development. As such, the type of problems facing these countries is primarily of a second-order nature. Angola and the Democratic

Table 1. Classification of Various African States in terms of Proposed Typology			
	First-Order Problems	**Second-Order Problems**	**More Complex Problems**
	SIRWA	**SIRWS**	**WP**
Southern Africa	Botswana Mauritius South Africa	Angola Democratic Republic of Congo Namibia Zambia	Lesotho Malawi Swaziland Tanzania
East Africa			Burundi Egypt Eritrea Ethiopia Kenya Sudan Tanzania Uganda

Republic of Congo (DRC) are politically unstable—being embroiled in seemingly endless civil war. Unfortunately, no end to this debilitating condition is in sight. Mozambique offers a glimmer of hope, as it has turned its back on civil war and is seemingly on the road to economic recovery. Institutional capacity there is extremely weak, however, and a high debt burden continues to hamper this recovery. The major floods that took place in Mozambique

yet it is also the source of water for South Africa via the Lesotho Highlands Water Project (LHWP). Water is one of the few natural resources that Lesotho can exploit (the other being labor and, to a lesser extent, diamonds); so it sells water to South Africa, using the royalties to finance other development projects. Significantly, all of the East African countries fall into this category, suggesting that the development problems in East Africa are

Turton and Warner enter into a philosophical, theoretical, and practical discussion that explores not only the usefulness of GIS but also the concern that it is being used to exploit existing power relations and concepts of security.

in early 2000 set its economic recovery back significantly and also were a manifestation of the inability to respond to crisis. Namibia is politically stable, but has become embroiled in the Angolan civil war and the DRC. This role does not bode well for its future, as Namibia is starting to hemorrhage precious financial resources that could be used in institutional development instead. Namibia also presents an interesting case in the sense that the first-order type of indicators shows the country to be relatively well-endowed with water. This impression is highly misleading, however, as the water that exists is found only on the northern and southern borders of the country, and is also difficult to exploit. The low population levels also create a false impression by presenting a relatively high per capita water availability, showing the flaws in first-order analyses. Zambia is politically stable but has a low level of economic activity, and the civil wars in both Angola and the DRC are impacting it negatively. Should Angola, the DRC, Mozambique, and Zambia manage to solve these problems, then they could conceivably become the regional breadbaskets, using their natural resource endowment to balance the regional water scarcity by becoming Virtual Water exporters within the Southern African Development Community (Turton et al., 2000b).

"The four cases that are classified under WP present a complex set of problems indeed. In these cases, there is a relative scarcity of both first and second-order resources, so dependence on external aid is likely to grow over time. Lesotho is an interesting case as it is first-order resource-poor—

far more complex than Southern Africa in relative terms…"

Turton and Warner also discuss the use of one of the most popular technological management tools promoted in water management today—remote sensing, or Geographical Information Systems (GIS). GIS has become a highly popular way to represent three-dimensional data. Turton and Warner enter into a philosophical, theoretical, and practical discussion that explores not only the usefulness of GIS but also the concern that it is being used to exploit existing power relations and concepts of security. According to the authors, one worrying trend here is the "securitization of water" and the use of GIS to reinforce that trend:

"…When water has been elevated to a national security concern, projects promoting water development become undebatable. The persistence of this phenomenon has given rise to a concept known as the 'sanctioned discourse,' whereby a select elite determines what may be said about water-related development projects and who may say it in the first place…

"…The relevant point here is that this practice can mean unwelcome information that goes contrary to the sanctioned discourse will be screened out by gate-keeping elites…

"…This leads us into a more sinister world, in which data is manipulated for political rather than scientific ends, establishing a link with the notion of legitimacy that was raised at the start of this article…Also, as the output of GIS depends on the input and the questions underlying it, GIS represents

the world in a way that reflects those interests. Depending on what gate-keeping elites want to show, they can manipulate their computer images to highlight and represent their preconceived image of reality. But what for? And for whom? Critical geographers have worried about who is empowered by GIS technology. The question 'what do you want to know and why do you want to know this?' is all the more apt in light of the potential for surveillance. Knowledge is power, and GIS could easily be used as a technology of power to reinforce the control of citizens by states."

In the final section of their article, Turton and Warner turn to examine four critical questions in the water debate: (1) Will there be enough water to support regional populations in the future? (2) Can GIS technology be used to map water resources and future population growth? (3) Has the question now become one of managing demand rather than supply? (4) How will demand management be achieved? Through a discussion of these questions, Turton and Warner present us with the beginnings of policy issues and recommendations aimed at getting at the underlying issue of second-order resources (again, which represent society's ability and willingness to deal with scarcities of a first-order resource). If this distinction between first- and second-order resources is not made and understood, they argue, hydropolitical policies are likely to fail.

Each of the papers in this series successfully delves under the surface of the population-water discussion—going beyond simple comparisons of population size, per-capita use and water availability. By looking at the nuances of definition, interpretation, and analysis, each paper examines the interplay between population and water issues globally and in their respective regions of study.

All three papers will be published by the Environmental Change and Security Project in fall 2001. Please write to Robert Lalasz at lalaszrl@wwic.si.edu *if you would like to receive copies when they are available.*

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Environmental Mission Recommendations for the U.S. Intelligence Community

By Captain Steve Kiser, USAF

Abstract

This article gives a concrete list of simple yet effective ways in which U.S. intelligence satellites can significantly boost the country's emerging environmental security mission. These recommendations (a) highlight a nexus of traditional national security issues and environmental security issues, and (b) largely promote synergistic cooperation between the traditional and the progressive. The article then analyzes both the direct and the associated costs of the proposed programs.

One important legacy of the Cold War is that the United States possesses a very well-functioning intelligence community with the capacity to collect once-unimaginable amounts of information and data. But strategists now rightly ask how or even if the current U.S. security posture—inarguably still defined by the Cold War—fits the chaos of the post-Cold War era. A new debate has opened regarding the place of non-state and non-military threats for national security planning, and many non-traditional areas (including food, water, and energy) are now being considered as essential "security" issues. Perhaps the most broadly discussed of these areas is the role and priority of environmental problems.

Environmental threats to both the United States and its interests abroad are clearly growing and will continue to grow in importance. And as environmental issues become more germane to U.S. security, the national security apparatus must be used to address them. While a considerable body of literature already addresses the significant emerging field of environmental security and its role in the U.S. national security paradigm, this article gives concrete recommendations to policymakers on how to use the U.S. intelligence community in an environmental role. It then broadly assesses the costs—both direct and associated—of these kinds of applications.

RECOMMENDATIONS

There are many specific areas where the application of U.S. strategic overhead systems could significantly aid the environmental security mission. While many private, non-governmental satellite programs and businesses already exist that could undertake some of the missions detailed below, it is important to note that U.S. intelligence community assets can do them better, quicker, more accurately, and at less cost.

Treaty Verification

Treaty verification is perhaps the most compelling case for an expanded environmental monitoring mission by the U.S. intelligence community. The spate of environmentally-related treaties and protocols in recent years highlights a relative void in the United States' ability to monitor treaty progress and adherence. Indeed, the United States is signatory (although the U.S. Senate has not ratified all of them) to nine major international environmental conventions. These include: the recently signed Stockholm Treaty on Persistent Organic Pollutants (the so-called "dirty dozen" treaty, with approximately 50 signatories); the Montreal Protocol on Substances that Deplete the Ozone Layer of 1992 (136 signatories); and the Basel Convention on Transboundary Movements of Hazardous Waste (136 signatories) (U.S. Department of State, 1998(a); "US to sign," 2001). Literally hundreds of smaller agreements, treaties, and protocols also exist. While absolute verification and compliance with every single environmental treaty is an unrealistic goal, having at least a robust verification mechanism for these treaties is a highly desirable goal for the United States.

While the United States has officially disavowed it, the Kyoto Protocol to the United Nations Framework Convention on Climate Change serves as a good example of the ratification burden required by the new generation

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of environmental treaties. Kyoto requires significant reductions in six greenhouse gases, including carbon dioxide, methane, nitrous oxide, and various substitutes for ozone-depleting chlorofluorocarbons (CFCs). The Kyoto Protocol has been criticized for (among other things) lacking concrete verification procedures. Indeed, even the U.S. Department of State admits that this is one of the unresolved portions of the treaty (U.S. Department of State, 1998(b)). Critics charge that the protocol contains no provision for answering even basic informational questions such as: How much carbon is in the air now? How much did each individual country emit in 1990—the treaty's baseline year? How much of each kind of greenhouse gas is each country emitting today? And how will we confirm a government's claims that it is (for example) planting carbon sinks? In addition, no openly-available carbon baselines exist for many of the nations who are signatories to the protocol. With no baseline, how does one measure progress?

Such treaty verification is a specific mission for which intelligence community satellite systems can help a great deal. While commercially available satellites could perform some treaty verification, intelligence satellites could do the job more quickly, more thoroughly, and with a substantially higher resolution (and thus higher accuracy) than other organizations. Additionally, with a quicker revisit time over various targets, monitoring potential violations or efforts to return to treaty standards could be more thoroughly monitored. An excellent example of this capability was demonstrated when the Director of the Central Intelligence Agency's Environmental and Societal Center (DESC) used Medea to report that a vast boreal forest in Russia might not be the huge carbon sink the Russians hoped it to be (National Intelligence Council, 1999).

The U.S. intelligence community's vast databases could also easily be mined to assess a country's total and types of economic activity, its total forested area, and other pertinent data to establish environmental baselines with more accuracy. While these imagery databases would not have all the necessary data for such a task, they can supply important pieces to the puzzle—pieces that will not be found elsewhere. Other environmental treaties pose similar problems and would similarly benefit from the intelligence community's involvement.

With environmental treaties and protocols increasing in both number and importance on the international stage, the United States would be wise (a) to use all its resources to establish accurate baselines for these treaties, and (b) then use its vast information-gathering resources to ensure other signatory parties are fulfilling their ends of the bargain. While the primary purpose of this use of intelligence community satellite assets is first and foremost protection of U.S. interests and treaty obligations, the goal of the treaties is environmental protection—a true nexus of national and environmental interests.

Warning for Potential Conflict or Humanitarian Disasters

One traditional mission of the U.S. intelligence community is to provide warning of impending conflict. Through a fairly complicated system of specific indicators that in theory are observable by the intelligence community, intelligence analysts are able to give warning of looming violence to military commanders and policymakers. A similar system of environmental indications and warnings is currently being developed at the Central Intelligence Agency's DESC—using food production, water supply, and demand for food and water as the key variables. Currently, this prototype system covers only Africa. Not only should this system be fully developed, it should have more complete data for at least other environmentally-stressed areas such as Russia, Central Asia, India, Indonesia and portions of China.

Intelligence satellites should be used as the primary source of data for this groundbreaking computerized system. The prototype system uses exclusively open-source data that comes from a patchwork of sources (N. Kahn, personal communication, July 22, 2000).[1] By having a single, reliable, U.S.-tasked data source: (a) variations between data sources can be eliminated; (b) a steady stream of data will exist; and (c) U.S. intelligence analysts will be given the flexibility to update the database on their timetable according to national need rather than relying on whenever data is produced by an open source.

This system graphically represents geographic areas (again, at the moment, only the African continent). It uses Geographic Information Systems technology to generate a display of population density, water supply and demand, food supply and demand, poverty indices, transportation network densities, distributed wealth, and a variety of other environmental factors. After selecting two of these variables—for example, water supply and demand—an analyst can then generate two color-coded maps depicting each variable. The system then gives the option of overlaying the two maps to produce a third map, highlighting where surpluses and gaps in supply exist. Other variables (such as carrying capacity, societal capacity, and susceptibility to natural disasters) are also being developed for the database.

While no one claims this system will accurately predict conflict itself, the value added to other types of analysis

(political, economic, and military, for example) is significant. A lack of food and water can be an early indicator of a failing state, as was the case in Somalia. Additionally, when U.S. troops are deployed to areas where access to water does not exist, this system can quickly be used to assess both how much water is available and how much stress the addition of U.S. personnel in the area will add to water supplies. Thus, the benefit of the system is twofold: while increasing the value and accuracy of the intelligence community's larger indications-and-warning system, it can also be used for more efficient military mission planning.

In addition, such a robust system could be a testing tool. By going back decades and collecting data from intelligence imagery archives, it could enable analysts to

have about how and why this stealthy disease flares up (Salopek, 2000). Other satellite-derived applications to human health at least ought to be explored.

Setting Environmental Baselines and Continuums

The U.S. government could also create a program with the singular purpose of creating year-by-year baselines of environmental conditions of the world, starting with the 1960s. As of about 1990, non-intelligence community satellites were able to collect enough data to measure the larger aspects of environmental change. In February 1995, President Clinton issued Executive Order 12951, authorizing the CIA to make public more than 800,000 photos taken between 1960 and 1972 by two

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If the U.S. government were also to release enough data from images archived from 1972 to 1990, analysts could build an unprecedented and invaluable 40-year global environmental continuum.

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conduct retrospective analysis on a variety of conflicts as well as to develop theories and models of conflict causality with greater accuracy and precision. Analysts could also use the system to analyze thoroughly actual conflicts to determine better what role environmental factors might have played in them. Such testing would add empirical data to the now largely-theoretical debate about the role of environmental factors in conflict.

From a disease-prevention perspective, the higher-resolution imagery provided only by intelligence satellites can be very beneficial as well. The potential spread of vector-borne diseases (especially malaria) can be more thoroughly tracked with high-resolution infrared or optical satellite imagery. Such imagery can better identify and characterize standing water areas, vegetation types, and other variables that promote such diseases. With that data, governments and relief workers can then help track and control such diseases by contributing to estimates of spatial and temporal distributions of disease risk (Kilston, 1997, page 642). As malaria holds the dual distinction of being a top killer around the world and becoming increasingly resistant to antibiotics, this mission could be a powerful tool in fighting the disease.

Another recent application of satellite imagery to world health centers on the mysterious and deadly Ebola virus. A recent study of NASA-generated satellite data shows that Ebola seems to infect humans most readily during rainy seasons that follow periods of extensive drought. This finding is one of the few clues researchers

of the earliest U.S. intelligence satellite platforms—Corona and Discoverer (Klass, 1995). If the U.S. government were also to release enough data from images archived from 1972 to 1990, analysts could build an unprecedented and invaluable 40-year global environmental continuum.

Such a continuum would allow for retrospective trend analysis that could help confirm or disprove current theories of environmental degradation, the impact of humans on the environment, and the role environment plays in conflict. The continuum would provide better perspective and a larger dataset for testing these theories. It would also furnish a series of baselines for measuring how rapidly the Earth's environment is changing, possibly also providing more clues than are currently available as to the causes of such change. This capability directly impacts aggregate security concerns. If the Earth's environment is changing significantly slower or faster than currently assessed, our national priorities will also change. As Vice-Admiral William O. Studeman, then the Acting Director of Central Intelligence, stated in 1995: "[t]he final lesson from the CORONA program is that these intelligence systems are valuable assets that belong to the American people. We should declassify them when their secrets are no longer critical to national security. Film from these early broad-area-search systems still contains a wealth of information" (Studeman, 1995).

Sensor Calibration and Ground-Truthing

Military technology is already being used to aid several

other non-military sensors (such as the NASA Earth Observing System constellation of satellites) to calibrate the sensors on these platforms (Trevedi, 2000). With minimal impact to national security concerns, this cooperation could continue to extend to other environmental monitoring and assessment efforts both inside and outside the U.S. government. Data collected from all types of environmental sensors—ground-based, airborne, or space-borne—could be compared with environmental data collected from the highly-sensitive and fully-calibrated intelligence satellite platforms.

This comparison would accomplish two things. First, it would calibrate and validate other valuable sensors, using previously-cleared personnel to conduct such tests. This practice would be economical for both the U.S. government and non-governmental environmental organizations (NGOs); it would cost NASA or an NGO far less to ground-truth its sensors using data from another government organization than it would to contract that work out or develop its own tests independently. Second, such calibration could also be used to adjust previously collected data, thus standardizing more and more environmental information. Such a synergistic combination of environmental analyses was illustrated with the introduction of the LANDSAT program. There is no reason to believe such efficiencies will not be accomplished through an expanded data-sharing program.

Cooperation between the Intelligence Community and Other Organizations

The U.S. intelligence community has developed a tremendous pool of expertise when dealing with remote sensing and satellite imagery. Two generations of analysts have come and nearly gone since the U.S. launched CORONA, its first imagery satellite, in 1960. Since then, imagery intelligence has become an integral part of the U.S. intelligence community's activity.

This expertise can be shared, and already is in some ways. For example, one of the most significant developments in Earth observations in 2000 was the launch of the Interferometric Synthetic Aperture Radar (IFSAR) on the space shuttle's space topography mission. This mission's purpose was to map approximately 80 percent of the globe's land surface using radar to collect elevation data at exceptionally accurate levels. Currently, NASA has elevation data at 100-meter samplings. ISFAR will provide that data at 30-meter samplings—over a three-fold increase in resolution (Kirsten Thompson, personal communication, July 20, 2000). This project is a joint project between the National Imagery and Mapping

Agency (NIMA, the organization which primarily interprets satellite data for the intelligence community) and NASA (FAS, 2000).

The collected information is expected to be highly valuable to a wide audience. The environmental community can use it for such activities as improving hydrological models, assessing erosion risk, achieving higher accuracy in delineation of watersheds, monitoring volcanic activity, and researching earthquakes (Kirsten Thompson, personal communication, July 20, 2000). Military personnel can use the information to develop extremely accurate flight simulators, logistic planning, terrain analysis for combat and traffic purposes, and improved battlefield management. Civilian applications exist as well: land use planning; communication considerations (such as line-of-sight microwave); or enhanced ground warning systems for civil aircraft (FAS, 2000).

IFSAR is but one example of the nexuses of environmental and traditional national security expertise that exist within the U.S. government. By using NIMA's expertise, environmental and other types of human security can be significantly enhanced.

Other Applications

The above recommendations are simply the largest areas in which the U.S. intelligence community's expertise, knowledge, and capabilities in satellites can and should be used to augment environmental monitoring and assessments. Below are a few examples of the dozens of other potential applications:

- Infrared satellites can not only aid firefighters combat forest fires, but they can also be used as an investigative tool to find out where and possibly how fires begin.
- A global, comprehensive coral reef assessment has not been conducted and (because of the sheer volume of imagery needed) is probably too expensive to undertake without the intelligence community's archive of images of coastlines around the world.
- The extents of global deforestation, desertification, and habitat destruction—all issues of concern for international treaties to which the United States is signatory—can be easily culled from images already being taken.
- Higher-resolution satellites in the infrared spectrum could give a much more accurate assessment of the health of forests around the world.
- Satellite imagery could give an extremely accurate

assessment of where and to what extent human development in sensitive environmental areas is occurring.

- Continuous monitoring of the polar caps (an indicator of global climate change), improved monitoring of ice flows and icebergs within international shipping lanes, and other Arctic phenomenon could also be gleaned from the intelligence community's data. An excellent example of such cooperation is the data released in the early 1990s by the U.S. Navy. The Arctic ice data (especially polar cap thickness) that U.S. submarines collected during the Cold War has now become a very valuable dataset for environmental scientists.

Costs

Assuming new responsibilities always carries costs, both direct and in opportunity. The proposals made in this article are no different: each carry a different kind of cost to be paid in different ways. While simply encouraging cooperation between the intelligence community and other federally-funded organizations and non-governmental organizations is relatively cost-free, funding for treaty verification would probably be rather high. And the creation of an environmental continuum would entail different sets of costs, both direct and indirect.

While a precise breakdown of costs for each of these proposals is beyond the scope of this article, it is possible to set up a framework of costs and analyze such concerns indirectly. The expenses associated with some of these recommendations fall into two broad categories—direct costs and associated costs.

The direct costs of these proposals is nearly impossible to calculate for a variety of reasons—the intelligence community's classified budget being the greatest barrier. Regardless, the direct costs of adding an environmental security mission to U.S. intelligence gathering activity are not in data collection but in adding the necessary personnel to conduct environmental analysis. For example, enormous amounts of archived U.S. intelligence information contain environmental data. The costs of putting these data to use for an environmental security mission lie in training and paying analysts to sift through these records and to glean the data needed, not in collecting additional data.

This same framework applies to intelligence collected both now and in the future. The U.S. intelligence community collects massive quantities of information every day; and there is more than enough collateral environmental data in this collection to keep analysts busy

without necessarily tasking intelligence assets to collect specifically environmental data. In addition, future improvements in the capabilities of U.S. intelligence community satellites will be able to eliminate any potential competition between traditional and environmental security analysis needs. For example, U.S. Representative Larry Combest (R-TX) has strongly advocated the deployment of a series of 24 different small satellites, which could produce images of 40- by 50- square mile swaths with approximately three-foot resolution. Within a single hour, such a constellation of satellites could image 17,980 square miles—an enormous quantity of data (Fulgham & Anselmo, 1998; "NRO Opens Up," 1997; and "DARPA Eyes," 1997).

Still, the costs of analyzing such data would not be prohibitive. Should the U.S. government decide it will be the main purveyor of analysts to this mission, direct costs for analysts, space, equipment, and other related assets should be less than U.S. $2 million annually.[2] However, a different approach could also be used. Instead of the U.S. government being the exclusive purveyor of environmental analysts, it could simply serve as a clearinghouse—releasing data to environmental scientists and certain environmental NGOs that are already conducting extensive analysis of environmental security issues. Such a "cooperative engagement" policy would allow a far larger number of environmental experts to look at more data and allow many of the above proposals (such as creating an environmental continuum or assessing coral reefs worldwide) to be conducted essentially free-of-charge to the government.

The downside of this proposal is the substantial increase in associated costs and the greater challenge included with such costs. Again, the majority of the proposals of this article deal largely with handling and releasing archival or collateral data. Because of how this information is collected and distributed, associated costs would probably exceed direct costs. First, the release of classified information requires human eyes to review (or "scrub") the data to ensure vital national secrets are not also being released. Additionally, simply moving classified material around requires a certain amount of paperwork and tracking. And providing and maintaining the necessary security clearances to the additional number of persons who would become "environmental security analysts" is no small task: just the background investigation to provide such clearances can take months. In sum, the acts of finding and analyzing environmental data itself cost little; the increased requirements on the infrastructure and bureaucracy necessary to release classified data would be substantial. Estimating the necessary funds for this set of

ENDNOTES

[1] Dr. Norm Kahn is a former senior analyst with the DESC. He gave an interview and briefing to the author at which sample datasets were demonstrated.

[2] This estimate is based off having 10 analysts, each paid an average of $50,000 annually, plus an infrastructure budget of $1.5 million—both, in the author's opinion, generous estimates

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OFFICIAL STATEMENTS

Below are excerpts from recent official statements in which environment, population, and human security issues are prominently cited in the context of national and security interests. The Environmental Change and Security Project welcomes information on other related public statements. Please see the inside cover of this issue for our contact information.

STATEMENT BY GEORGE W. BUSH
President of the United States

Excerpts from President Bush's remarks on global climate change at the White House, Washington, DC
11 June 2001

The issue of climate change respects no border. Its effects cannot be reined in by an army nor advanced by any ideology. Climate change, with its potential to impact every corner of the world, is an issue that must be addressed by the world.

The Kyoto Protocol was fatally flawed in fundamental ways. But the process used to bring nations together to discuss our joint response to climate change is an important one. That is why I am today committing the United States of America to work within the United Nations framework and elsewhere to develop with our friends and allies and nations throughout the world an effective and science-based response to the issue of global warming….

The policy challenge is to act in a serious and sensible way, given the limits of our knowledge. While scientific uncertainties remain, we can begin now to address the factors that contribute to climate change.

There are only two ways to stabilize concentration of greenhouse gases. One is to avoid emitting them in the first place; the other is to try to capture them after they're created. And there are problems with both approaches. We're making great progress through technology, but have not yet developed cost-effective ways to capture carbon emissions at their source; although there is some promising work that is being done.

And a growing population requires more energy to heat and cool our homes, more gas to drive our cars. Even though we're making progress on conservation and energy efficiency and have significantly reduced the amount of carbon emissions per unit of GDP.

Our country, the United States is the world's largest emitter of man-made greenhouse gases. We account for almost 20 percent of the world's man-made greenhouse emissions. We also account for about one-quarter of the world's economic output. We recognize the responsibility to reduce our emissions. We also recognize the other part of the story—that the rest of the world emits 80 percent of all greenhouse gases. And many of those emissions come from developing countries.

This is a challenge that requires a 100 percent effort; ours, and the rest of the world's. The world's second-largest emitter of greenhouse gases is China. Yet, China was entirely exempted from the requirements of the Kyoto Protocol….

Our approach must be flexible to adjust to new information and take advantage of new technology. We must always act to ensure continued economic growth and prosperity for our citizens and for citizens throughout the world. We should pursue market-based incentives and spur technological innovation.

And, finally, our approach must be based on global participation, including that of developing countries whose net greenhouse gas emissions now exceed those in the developed countries….

STATEMENT BY COLIN L. POWELL
U.S. Secretary of State

Excerpts from Address by Secretary Powell to The United Nations General Assembly Special Session on HIV/AIDS
25 June 2001

Comprehensive and coordinated these efforts must be, for AIDS is not just a humanitarian or health issue. It not only kills. It also destroys communities. It decimates countries. It destabilizes regions. It can consume continents. No war on the face of the earth is more destructive than the AIDS pandemic.

I was a soldier. But I know of no enemy in war more insidious or vicious than AIDS. An enemy that poses a clear and present danger to the world. The war against AIDS has no front lines. We must wage it on every front.

And only an integrated approach makes sense. An approach that emphasizes prevention and public education. But it also must include treatment, care for orphans, measures to stop mother-to-child transmission, affordable drugs, delivery systems and infrastructure, medical training. And of course, it must include research into vaccines and a cure.

All of these elements are essential and must be aggressively pursued. But unless a strong emphasis is put on prevention, prevention and more prevention, this pandemic will continue to rage out of control.

In this global war against AIDS, everyone can and

I believe that the family, the local community, religious institutions, and the private sector form the foundation of a stable and prosperous society.

As a great power, I believe America must have a foreign assistance program to accomplish its foreign policy objectives and to express the deep humanitarian instincts of the American people. Properly managed it is a powerful instrument for the President to influence the course of events around the world. Too often we see military force and diplomacy as the only instruments at his command, when in fact foreign assistance is sometimes the most appropriate and potentially the more likely to

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I was a soldier. But I know of no enemy in war more insidious or vicious than AIDS.
—Colin L. Powell, U.S. Secretary of State

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must be a leader. Everyone can and must be an ally. We are all vulnerable—big nations and small, the wealthy and the poor. We cannot let AIDS divide us. My country is ready to work with all nations to build a global coalition of action against this common foe….

STATEMENT BY ANDREW M. NATSIOS
Administrator, U.S. Agency for International Development

Excerpts from Administrator-Designate Natsios's testimony on his nomination to USAID Administrator before the U.S. Senate Committee on Foreign Relations, Washington, DC
25 April 2001

Four principles frame my world-view:

I believe that we live in a fallen world inhabited by imperfect people who stubbornly resist other people's dreams of paradise. That is why violent revolution nearly always ends up disappointing or horrifying.

I believe that a universal moral order exists and that while our foreign policy should be focused on protecting and furthering our broad national interests, it can not stray too far from the constraints moral principle places on our actions as a nation.

I believe that incremental reforms to remedy terrible injustice, carefully implemented, over the longer term can make gradual improvements in the world. There are few quick fixes.

succeed, when diplomacy is not enough or military force imprudent. A peaceful, stable, and civilized world order is very much in the interest of the United States as the sole remaining superpower with the world's largest economy….

The two most distinctive trends in the world since the fall of the Berlin Wall have been globalization and conflict. The rise of the Internet, of a more open international trading and financial system, the spread of democratic capitalism as the preferred model of political and economic development, contrast remarkably with the increase in the number of failed or failing states and the increasing number of civil wars, many of enormous brutality.

The U.S. Agency for International Development (USAID), along with the rest of our foreign policy apparatus, has adjusted too slowly over the last decade to these two challenges.

Nearly two-thirds of the countries with USAID field missions have been ravaged by civil conflict over the past five years, in some cases destroying years of economic and political progress….Should I be confirmed, USAID will begin a deliberate effort to focus its limited program funds on conflict prevention and resolution, in conjunction with already existing efforts at the State and Defense Departments. We had warning signs of the Rwandan genocide well before it occurred; because we did not act on them nearly a million people are dead and central Africa has been plunged into a civil war which has killed nearly two million additional people.

According to the Carnegie Commission for Preventing Deadly Conflict, total NATO peacekeeping and humanitarian aid efforts in Bosnia cost $53 billion.

Surely it is better to prevent disasters, such as Rwanda and Bosnia, before they occur, than to clean up the mess after it is too late.

The globalization of the world economy has meant that governments, while still essential, are not the only institutions through which public services are provided. The role of religious institutions, non-governmental organizations, private foundations, universities, and the private market economy in providing services and accomplishing public objectives has dramatically increased. USAID will undertake a much more systematic effort to leverage its funds and technical expertise with those of these private institutions to serve poor people in the developing world and build stronger self-sustaining local institutions. These partnerships will profoundly change the model through which USAID does its business with a much greater role for private institutions in development in the future.

Without economic growth no development is ultimately sustainable. I would like to focus more of USAID's resources on economic development to reduce poverty and on agricultural development to reduce hunger and malnutrition. The American free market approach to both agricultural and economic development provide important lessons which USAID should do more to share with the developing world. For much of the third world, economic growth and poverty reduction are synonymous with agriculture since 75 percent of the world's poor live in rural areas. All countries that have graduated from the third to the first world have begun with their agricultural sectors. The last fifteen years have not been good to agriculture programs in USAID: agricultural development funding has declined from $1.2 billion in 1985 to $300 million this year. In 1985, USAID had 258 agricultural scientists and agricultural economists. When I left the first Bush Administration that had declined to 183; now there are only 48 left. I believe this situation must be reversed.

USAID has and will continue to maintain preeminent international leadership in health. Its programs in women's reproductive health, child survival, HIV/AIDS, infectious diseases, and nutrition are among the best in the world. The HIV/AIDS epidemic is now reaching such catastrophic levels it is decimating entire societies, creating negative population growth rates: we are beginning to see famine-like conditions developing in some particularly hard-hit countries….
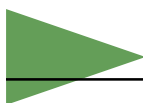
GLOBAL ENVIRONMENTAL POLITICS

Global Environmental Politics invites submissions that focus on international and comparative environmental politics. The journal covers the relationship between global political forces and environmental change. Topics include the role of states, multilateral institutions and agreements, trade, international finance, corporations, science and technology, and grassroots movements. Particular attention is given to the implications of local-global interactions for environmental management as well as the implications of environmental change for world politics. Articles must make a theoretical or empirical contribution to understanding environmental or political change. Submissions are sought across the disciplines including political science and technology studies, environmental ethics, law, economics, and environmental science.

For more information, contact: Peter Dauvergne, Editor of *Global Environmental Politics*, University of Sydney, Faculty of Economics and Business, Merewether Building, H04, NSW, 2006, Australia; Email: gep@econ.usyd.edu.au; and Internet: http://mitpress.mit.edu/journal-home.tcl?issn-15263800
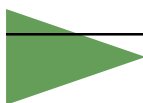
STATEMENT BY SENATOR BILL FRIST, M.D.
U.S. Senator (R-Tenn.)

Excerpts from Senator Frist's address ("Emerging Infections Diseases and the Public Health System") made to the CDC International Conference on Emerging Infectious Diseases 16 July 2000

Certainly in the battle to keep up with new and re-emerging infectious diseases, change is the force that drives us. Yet, despite all the progress we are making, disease still seems to have the upper hand. New diseases keep emerging—30 in the past 30 years, and old diseases are making a comeback—stronger and more resistant to treatment than ever before.

STATEMENT BY BOB SMITH
U.S. Senator (R-N.H.) and former Chair of the Senate Committee on Environment and Public Works

Excerpts from Senator Smith's opening statement to the Senate Committee on Environment and Public Works, Washington, DC 2 May 2001

Global climate change is an issue that has generated a great deal of excitement across the political spectrum. Unfortunately, much of that excitement has been driven by politics. For example, when President Bush recently confirmed what everyone in this room already knew—that the Kyoto Protocol was dead—he was loudly

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> ## We should apply the precautionary principle not only to the examination of possible harm from emissions, but also to the possible harm to the economy from overly-aggressive emission curbs.
> ### —Bob Smith, U.S. Senate

And so our job—mine in the Congress, and yours on the front lines of science—is not merely to see the world as it *is*, but the world as it *could be*—if we do nothing to counter the consequences of disease.

What are those consequences—beyond death and disability?

In fragile parts of the world, the consequence is often chaos. Persistent infectious disease, and the resulting mortality, promotes economic decay, social fragmentation, and political destabilization that creates government instability, in some cases, regional instability, and—in the worst case scenario—war. Rwanda, for example, is a case study of this type of cascading chaos.

In other areas like Sudan, where war came first, the results are famine, population displacement, malnutrition, and a whole host of related health problems ranging from dehydration and abscesses to gunshot wounds and tuberculosis….

During the 17 years in which civil war has raged in Sudan, over four million Sudanese have been displaced, making them the largest internally displaced population in the world. Two million have died. The death almost always is the result of malnutrition and subsequent infection secondary to displacement. The link between poverty, malnutrition, political instability and infection is evident….

jeered.

While there are those who will continue to demand the Administration reverse itself, the reality is that if we, the Senate, were to vote on Kyoto today, it would certainly be defeated by a strong bipartisan vote.

We made it very clear by an overwhelming 1997 vote of 95-0, that this body would NOT support the provisions of the Kyoto Protocol. Kyoto may be a political lighting rod, but the treaty itself is a false issue. To continue to push forward on this failed treaty is to invite continual partisan bickering and ultimately delay a productive discussion on Climate Change….

Our challenge is to look at the issue based on a hard examination of what we know, what we do not know, and what we must do in the name of prudence….

First, what do we know for certain? Just three things:

1. Atmospheric concentrations of greenhouse gases are increasing.
2. Human activities are responsible for a significant portion of that increase.
3. Like a high school chemistry experiment, at some point the increased concentrations will cause serious changes in the chemistry of our planet.

What DON'T we know?—Pretty much everything else about climate change. All of the projections about sea level rises, temperature increases, the future rate of

concentration increase and the cost of emission reductions are speculation; they are derived from models based on assumptions and predictions. The uncertainty in the results of this work is tremendous.

So, how do we craft policy from that much uncertainty? Cautiously. Very cautiously.

Many of those who have supported the Kyoto Protocol have argued that because emissions related to human activities have the potential to lead to adverse climate changes over the course of this new century, then we must err to the side of caution by dramatically reducing industrial emissions of CO_2 and other greenhouse gases.

To that I say, caution is a good thing, but only when appropriately applied.

We should apply the precautionary principle not only to the examination of possible harm from emissions, but also to the possible harm to the economy from overly-aggressive emission curbs. An appropriate policy should recognize both the economic and environmental hazards of too little or too much action regarding climate change. If we are too aggressive we could damage our economy and cripple our ability to address this and other pending environmental matters. If we are too timid we could invite environmental peril that could cause economic ruin in parts of the nation….

STATEMENT BY KOFI ANNAN
U.N. Secretary General

Excerpts from Secretary General Annan's remarks during the announcement of a proposal for a global fund to fight HIV/AIDS, malaria, and tuberculosis, with U.S. President George W. Bush and Nigerian President Olusegun Obasanjo at the White House, Washington, DC
11 May 2001

To defeat this epidemic that haunts humanity and to give hope to the millions infected with the virus, we need a response that matches the challenge. We should now build on the remarkable progress over the last year in galvanizing global awareness of the threat of HIV/AIDS.

I believe we can all agree on five key objectives for our response. First, to ensure that people everywhere, particularly young people, know what to do to avoid infection; second, to stop perhaps the most tragic form of HIV transmission, from mother to child; third, to provide treatment for all those infected; fourth, to redouble the search for vaccine as well as cure; and, fifth, to care for all those whose lives have been devastated by AIDS, particularly the orphans, and there are an estimated 13 million of them worldwide today and their numbers are growing.

As we declare global war on AIDS, we will need a war chest to fight it. We need to mobilize an additional $7 million to $10 billion a year to fight this disease worldwide. The Global AIDS and Health Fund that I have called for as part of this total effort would be open to the nations, as you heard from the two Presidents, from governments, civil society, private sector, foundations and individuals—all hands on deck. And the resources provided must be over and above what is being spent today on the disease and on development assistance to poor countries.

STATEMENT BY THORAYA A. OBAID
Executive Director, United Nations Population Fund (UNFPA)

Excerpts from Dr. Obaid's statement to the African Summit on HIV/AIDS, Tuberculosis and Other Related Infectious Diseases, Abuja, Nigeria
27 April 2001

We at UNFPA work with all countries of Africa on all matters concerning reproductive health. From this vantage point we have been concerned about the spread of HIV/AIDS since it first raised its head as a public health issue in Africa, and we are working with governments, our partners in UNAIDS, other international organizations and civil society to contain it….

I fear that in the early days many of those involved underestimated the impact of the infection. Now we can all see that the pandemic has reached the point where it represents a real threat, not only to individual lives, but to families, communities, and to development itself. I can say with confidence that we are now united in the effort to defeat it.

First, treatment, care and support are critically important to relieve suffering and improve the lives of those affected; but the pandemic will be ended only by reducing the number of new cases and preventing the further spread of infection.

Second, there is still a great deal to learn about the

virus and we must continue all possible efforts to find a vaccine. At the same time, we already know enough to mount an effective prevention campaign.

Third, African countries need the world's help and many additional resources to help fight HIV/AIDS, but success will come as the result of leadership and commitment within Africa itself.

Fourth, Africa's leadership in fighting HIV/AIDS and preventing its spread will provide many lessons that can be used in other parts of the world, especially in Asia and Eastern Europe where the disease is beginning to take hold.

Preventing Further Spread

Providing treatment, care and support for more than 25 million people now living with HIV/AIDS in Africa is a human rights imperative and a public health priority. Mounting an adequate response to this human tragedy will be the first great test of our common humanity in the 21st century….

We welcome recent action to reduce the cost of treatment, and the promise this holds for lengthening and improving the quality of many lives. But in every successful campaign against disease, prevention accompanies treatment, and success is measured in falling numbers of new infections.

In this respect, the battle against HIV is no different from fighting any other virus. However, several unique and deadly characteristics assist the transmission of HIV, including the presence of other sexually transmitted infections. In preventing the further spread of HIV, we must also hold back these resurgent diseases, by prevention as well as treatment. We must also recognize the part played by poverty and deprivation in spreading infection.

Effective Prevention

Experience shows that the first line of defence is acknowledging that HIV/AIDS is a serious threat, unlike any Africa has faced, and responding accordingly. By killing men and women in the prime of their lives, AIDS removes from society its most productive members, those on whom the family, the community, and the country most rely.

Yet the infection is still often seen as shameful. This summit sheds the shame and brings forward openness about the disease, propelling efforts to fight it.

We often invoke cultural values to justify our inaction. But our cultures are full of values that support women

HIV/AIDS AND HUMAN SECURITY IN SOUTHERN AFRICA
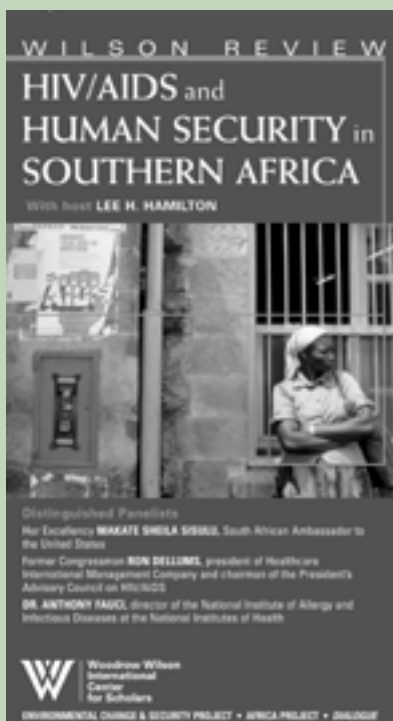
"At least half of all 15 year olds in countries including South Africa, Zimbabwe and Botswana are projected to die from HIV/AIDS in the coming years. This is a catastrophe of staggering proportions."

Lee H. Hamilton, Director, Woodrow Wilson Center

The Woodrow Wilson International Center for Scholars presents a 90-minute program to raise awareness of HIV/AIDS in Southern Africa. Formidible obstacles exist to stemming the tide of the disease in Africa, including poverty, lack of education and infrastructure, and cultural stigma. The distinguished panelists discuss the nature and scope of this devastating epidemic, efforts underway in Africa and internationally to control the disease, and approaches the global community should take in response to the unprecedented human suffering caused by HIV/AIDS.

The tape is sponsored by the Woodrow Wilson Center's Environmental Change and Security Project, Africa Project and *Dialogue*.

For more information go to, e-mail escpwwic@si.edu or go to http://ecsp.si.edu

and young people, that promote knowledge and dialogue, that build on community solidarity and mutual support among its members. Let us call upon all these cultural values to move us forward in the fight against HIV/AIDS.

Over half of all new infections are among young people. As parents and adults, we may have reservations about what we should tell our children; we may find it difficult to speak about sexual activity; we may fear that we will encourage a permissive atmosphere. But we must overcome our reservations. Experience will reassure us —all the evidence shows that young people who are armed with information and who have access to counseling and services will either adhere to abstinence or delay their sexual activity, and are less likely to fall victim to infection or unwanted pregnancy….

Among the youth, young women are especially at risk. Women are often not equal with men as they enter into sexual relations; often they are forced into sex due to violence or the effects of poverty. And here we have to remember women in situations of military conflicts and in refugee and displacement camps, globally and in Africa in particular. We must empower women, and especially girls, to exercise their right to say NO.

Men also need special attention, to convince them of their responsibility for stopping the outbreak and protecting their partners, and to ensure that they have access to condoms and other services, including treatment for sexually transmitted diseases. We must work with men to ensure that they respect women's right to say NO to unsafe sex as well as to abstain from sex. We must always see men and women as partners in a relationship built on mutual respect, trust, comfort, and commitment.

We must deploy the whole range of reproductive health services against HIV/AIDS and other sexually transmitted diseases. Thanks to many years of work, these services now exist in all countries of the region, and the systematic approach to prevention is well known. We just need to take the necessary action to move forward.

Resources and Leadership

Resources are very short for all these essential activities. Every country has plans to expand quality reproductive health services, to train new health care workers and to expand facilities for treatment and care of AIDS patients. A greatly increased supply of reproductive health commodities of all kinds is needed….

STATEMENT BY GRO HARLEM BRUNDTLAND
Director-General of the World Health Organization

Excerpts from Dr. Gro Harlem Brundtland's remarks at HRH the Prince of Wales's Business & the Environment Programme Annual Lecture on "Healthy People, Healthy Planet," London 15 March 2001

Over the past forty years, I have been deeply involved with three powerful movements: for democracy and participation of women, for the environment, and for global public health. Environment moved center-stage in the 1980s. We have been through a decade of real gains for democracy, and women's participation has made substantial strides too. Major interest in global health is scaling up now. Are there parallels to be drawn?

The first reflection is on the key importance of awareness raising. Progress in such areas is very limited without a solid and informed public debate which creates a real political momentum for action. This process is primarily driven by civil society and the media….The debate over the moral, economic, social, and security consequences of this [HIV/AIDS] catastrophe now unfolding around the world has forced health onto the agenda in a way we have not seen before.

Health has now taken a central place; within the context of debt relief discussions, as a central element of campaigns around structural causes of poverty, the new focus on women, and children issues. There is growing awareness and a movement for change. It is utterly unacceptable that preventable diseases should be partly responsible for keeping billions of people in poverty. I mentioned that, for the environment, the link to the economic impact was central in creating a momentum towards change. What about health?

When I took up my post at the World Health Organization, there were some early indications that there was more to the relationship between health and development than what had traditionally been accepted.

To increase our understanding about this key relationship, I formed the Commission on Macroeconomics and Health. Now, a good year into its work, it is beginning to assemble some powerful evidence for saying that we have massively underestimated the role that health can play in determining the economic prospects of the world's poor communities.

I believe we are now standing at the threshold of a major shift in thinking. Until recently, many development professionals argued that the health sector is only a minor player in efforts to improve the overall health of

populations. And the overwhelming majority of finance officials and economists believed that health is relatively unimportant both as a development goal and as a strategy for reducing poverty. Health spending was seen as consumption of scarce resources rather than investment in a common future. But this is changing. Health may be far more central to poverty reduction than our macroeconomist colleagues previously thought.

We have known for years that people who are poor are more likely to get sick. But we now know much more about how ill health also creates and perpetuates

STATEMENT BY MARK MALLOCH BROWN
Administrator, United Nations Development Programme (UNDP)

Excerpts from Dr. Brown's statement to the High Level Segment of CSD-9 on "Sustainable Development and Affordable Energy for the Poor"
19 April 2001

Environment and development goals are inextricably linked. Our planet's capacity to sustain us is eroding.

> ## Too often, by rich and poor alike, sustainable development is seen as a code word for rationing…
> ### —Mark Malloch Brown, UNDP Administrator

poverty, triggering a vicious cycle which hampers economic and social development and contributes to unsustainable resource depletion and environmental degradation. We are seeing evidence that health gains trigger economic growth and—if the benefits of that growth are equitably distributed—this can lead to poverty reduction….

Illness does not respect national boundaries. The patterns of globalization that promote increasing inequities will encourage the spread of illnesses—particularly those which are associated with extreme poverty. In the modern world, bacteria and viruses travel almost as fast as money. With globalization, a single microbial sea washes all of humankind. There are no health sanctuaries.

The separation between domestic and international health problems is no longer useful, as over two million people cross international borders every single day. A tenth of humanity each year. The Government of the United States has declared that the global epidemic of HIV/AIDS is a national security threat. Russia's people, and those in neighbouring countries, are seriously concerned with the rapid spread of multidrug resistant tuberculosis: governments and partners are doing their best to respond….

So poverty links health and environmental issues together. We are moving towards a comprehensive view of development, focused on poverty reduction, participatory democracy and empowering of all groups in society….

And while the threat is global, the impact is most severe in the developing world. The decline of major ecosystems, the degradation of over 1 billion hectares of agricultural land, diminishing supplies of clean water, and the growing prevalence of climate-related natural disasters are all having a disproportionately brutal impact on the poor. And the benefits of global economic growth are not reaching the poorest people.

Quite simply, if we do not successfully arrest and reverse these problems, we will not be able to meet the development targets set out in last year's historic Millennium Declaration, including the overarching goal of halving extreme poverty over the next 15 years.

But to succeed in meeting those goals we must first succeed in changing the terms of the debate. Too often, by rich and poor alike, sustainable development is seen as a code word for rationing: it is regarded as a Trojan horse that will require people to sacrifice economic growth, higher living standards and a better quality of life to achieve longer-term protection of the environment.

So one critical challenge facing this Commission [on sustainable development] and next year's summit is to tackle this misperception head on. Clearly there are tough choices and real tradeoffs that have to be made. But we know there is also significant scope for action that simultaneously protects the environment and reduces poverty by promoting economic growth that is equitable and sustainable.

We must do a much better job of explaining the "win-win" opportunities—and how sustainable development is at its root about improving the quality of life. And we must do this not by limiting growth, but by managing it much more effectively through smarter public policy at global, regional and national levels that

leads to improved incomes, health, education and real opportunities for the poor….

STATEMENT BY KLAUS TOEPFER
Executive Director, United Nations Environment Programme (UNEP)

Remarks made at the opening of the 18th Session of the Commission on Human Settlements, Nairobi, Kenya
12 February 2001

The relationship between Habitat and UNEP goes beyond traditional symbolism. Habitat and UNEP have been inextricably linked for 25 years. We share the same premises…. There can be no global environmental sustainability without the sustainability of human settlements, without overcoming divided cities, without secure tenure, without good urban governance, without shelter for all….

We meet at a time of unprecedented international awareness for reducing poverty, improving the environment and human settlements…. Environment and human settlements have taken their rightful place at centre stage in the development arena in preparation for the five years review of the City Summit in Istanbul 1996 and the ten years review of the Earth Summit in Rio 1992, now decided to be the World Summit for Sustainable Development, in Johannesburg 2002….

Cooperation and partnership make us both stronger and more efficient. To mention only some of those areas of synergy:

The cooperation in emergencies. The tremendous increase of natural and man-made emergencies demands common responsibilities from early warning, precautionary measures and recommendations up to vulnerability standards and concrete responses in emergency relief.

The urban environmental challenge needs common solutions from water and sewage via planning for waste, air pollution, and cities. The fight to reduce the greenhouse gas emissions must be won in the cities; renewable, decentralized energies are necessary for rural energy needs and by achieving these ends, we shall stabilize the rural settlement structures.

Local administration, good urban governance and basic needs are as directly linked with the mandates of our two organizations as they are with secure tenure….

The repercussions of the main environmental challenges to the human settlement structures are more and more visible, demanding concentrated action. Again, I give some examples of such interrelations:

- Rapid desertification is linked with the appearance of more and more environmental refugees, increasing the pressure on and explosive growth of urban areas.
- Climate change is a direct threat to human settlements when we consider that nearly 40 percent of cities with populations greater than 500,000 are located on the coast.
- And the increase in occurrence of malaria is a direct threat to human health.
- Air pollution, especially linked with mobility in the larger settlements, exceeds health standards in many mega cities.
- The public health hazard of contaminated water supplies as well as all kinds of disease transmission from inadequately treated sewage.
- All these challenges are areas of common responsibility for Habitat and UNEP….

STATEMENT BY KADER ASMAL
Minister of Education, Government of South Africa and Chair, World Commission on Dams

Remarks made by Professor Asmal ("Water is a Catalyst For Peace") at the Opening Session of the Stockholm Water Symosium Laureate Lecture, Stockholm, Sweden
14 August 2000

As rivers shrivel, freshwater ecosystems can't abideth. As another generation cometh, more people hunger and thirst for less food and water. Despite existing dams, pipes, canals and levees, 1.2 billion people, or one in five worldwide, lack access to safe drinking water. Three billion, or half the world, lack sanitation; millions passeth away from waterborne disease. Farmers compete with booming cities for water. In a decade we drain aquifers that took centuries to fill. In dry regions, saltwater pollutes groundwater miles from sea. In China, Mexico, India, water tables fall a meter a year, and the earth above subsides upon them. Worse, in 2025 we must find a fifth more water for 3 billion new people, shoved against the

hard wall of finite supply. By then, one in three will struggle just to find water to drink and bathe, much less grow food.

This scarcity sounds bleak, and it is. But some see it as the brighter side of troubling water security issues. They say scarcity locks developed and developing nations in a fierce, competitive struggle in which governments must satisfy the thirst, hunger, and hygiene of a nation's restless millions, no matter the cost. It is their national interest. And thus, they maintain, when rivers cross borders and are consumed both within and between countries, water scarcity leads to water stress, which leads to water wars.

Transboundary Waters

Indeed, never before have stakes been higher, players more numerous, the field more complex. In 1978 there were 214 international basins; with the break-up of the Soviet Union and formation of the Balkan states, there are now 261. These rivers cover 45.3 percent of the land surface of the earth, and carry 80 percent of its available fresh water. They cover 145 nations; and 21 nations, such as Bangladesh, lie entirely within a shared basin.

It is true that stress, tensions and disputes are inevitable, in and between nations. Water, or even sediment, used or diverted by you, upstream, is not available for me, struggling downstream. I am likely to get "tight jaws" over your plans to develop it. In anger we may exchange words, or lawsuits, or…much worse. In a number of so-called "hot spots" and "flashpoints" around the globe—the Middle East, Southern Africa, South Asia or the Nile, water diplomats negotiate even as I speak.

Chorus of Doom

A century after Mr Twain's lonely solo, the tune "water's for fighting over" has escalated into a global symphony, with drumbeat, full orchestra and halleluja chorus:

• In 1991, my World Water co-Commissioner Asit Biswas predicted that "the political tensions between certain neighbouring countries over the use of international rivers, lakes and aquifers may escalate to the point of war, even before we move into the 21st Century."

• Four years later, World Bank vice-president for environmentally sustainable development, my friend Ismail Serageldin warned, "wars of the next century will be over water," not oil.

• "My fear is that we're headed for a period of water

wars between nations," Klaus Töpfer, head of the UN Environment Programme, said recently. "Can we afford that, in a world of globalisation and tribalisation, where conflicts over natural resources and the numbers of environmental refugees are already growing?"

• "Battles have been fought over water allocation in many other countries," asserts Mikhail Gorbachev. "The potential for a conflict over water is perhaps at its most serious in the Middle East where water supplies are extremely limited, political tensions traditionally run high, and water is just one of the issues that may divide countries."

With all due respect to my friends, have battles been fought over water? Is water scarcity a *casus belli*? Does it in fact divide nations? My own answer is no, no and no. I recognise the obvious value to sensational Water War rhetoric. Alarmists awaken people to the underlying reality of water scarcity, and rally troops to become more progressive and interdependent. By contrast, to challenge or dispute that rhetoric is to risk making us passive or smug about the status quo, or delay badly needed innovations or co-operation against stress. And yet I do challenge 'Water War' rhetoric. For there is no hard evidence to back it up. If the "water's-for-fighting" chorus is off key, then its disharmony affects lives as well. It shifts energy and resources from local priorities to foreign affairs. It scares off investment where it is most in need. It inverts priorities, delays implementation of policy. And it forgets that water management is, ultimately, about real people. Mahatma Gandhi said, "When you are unsure of a course of action, remember the face of the poorest, weakest person in society and ask yourself what impact the action you are about to take will have on that person." More recently Nelson Mandela reiterated that democratic systems lose their validity if they fail to combat and eradicate poverty.

We thus would be well advised to remember that, for the poorest and weakest, water's for drinking, not fighting over. The poor are most affected by rhetoric, just as they are by war. It is easier to ignore their thirst than to divert attention to potential foreign threats, real or imagined. Easier, not better. To help the poor and weak, let us reform our unstable, consumptive, ultra-nationalistic habits to share our resource.

That requires a paradigm shift. In the past we have often overdeveloped transnational waters based on the needs of top-down national strategic policies; perhaps we now must develop bottom-up national strategic policies based on the needs of our critical transnational

waters. This is not radical, or even unusual. It grows out of the history of conflict resolution on our border-crossing rivers; among the first was the USA....

- Turkey's plans to build a complex of 20 dams on the Euphrates River, upstream from fast-growing and chronically drought-prone Syria, brought an exchange of tensions, leverage, and threats, like former Prime Minister Ozals' that Turkey might cut off the river's water.
- On the Indus, Pakistan warned in no uncertain terms that water cut off by a dam upstream in India would lead to trouble; Indian warned back against flood damage from Pakistan's downstream dam.
- The Nile River has been seen as another area of tension between both upstream and downstream countries.
- On Parana River, Argentina fiercely opposed plans by Brazil and Paraguay to construct the world's biggest hydrodam because it would expropriate Argentina's own natural resources.
- In the Middle East, the one thing that Israel's Prime Minister Barak, Jordan's King Abdullah and Palestinian leader Yasser Arafat can all agree upon is that failure to resolve territorial and self-determination issues could result in a conflict worse than all previously seen in the region, and water scarcity is a reflection of larger political problems.

The Historical Evidence

I have seen sovereign states and ethnic groups within nations go to war over every resource—oil, land, humans, diamonds, gas, livestock, or gold—but never, interestingly, over renewable resources, and never, in particular, over water development and dams. True, water has never been more scarce, and there is always a first time for anything. But there is also a difference between reaching a snapping point and snapping; between being pushed to the brink of conflict over water and waging a water war.

For two years, the World Commission on Dams has explored that difference. We explore not only the role dams play among peoples and nations, but equally important, we examine the strategic role of dams between them, asking: Does our need for water divide us, or unite us?

The latest US policy—a multi-million dollar agenda which grew out of a meeting of its intelligence, military diplomatic and executive officials—asserts that competition over water and dams leads to conflict. But such a policy is betrayed by the country's own history. For like the other competitive nations, Canada and the

U.S. nearly went to war over water; they manoeuvred over rivers and dams, they went eyeball to eyeball, and then, like riparian nations everywhere have always done, they both blinked.

Why? There is of course no one clear or easy answer why peace broke out over water there, and elsewhere. No universal secret, no "magic bullet" emerges. But there are rational clues, or principles, to consider as potential reasons. And all share one common denominator. Water.

Water: Catalyst for Cooperation

Indeed, just as rain does not start but rather cools and suppresses fire, so water, by its very nature, tends to induce even hostile co-riparian countries to cooperate, even as disputes rage over other issues. The weight of historical evidence demonstrates that organised political bodies have signed 3600 water-related treaties since AD 805. Of seven minor water-related skirmishes in that time all began over non-water issues. Most dealt with navigation and borders, but since 1814 states have negotiated a smaller proportion of treaties over flood control, water management, hydropower projects, and allocation for consumptive and non-consumptive use.

There are strategic reasons. Of all the 261 transboundary waters, in only a few cases: (1) is the downstream country utterly dependent on the river for water; (2) can the upstream country restrict the river's flow; (3) is there a legacy of antagonism between riparians; and (4) is the downstream country militarily stronger than upstream.

Another reason involves scale and focus. For water peace to emerge, negotiators think local, act local, and draft treaties that stem from local water project on a specific local river, lake, or aquifer that straddles two or more nations. These appear to have more real and lasting authority than broad, vague, undefined agreements with far reaching scope but little impact. This does not mean that states should not ratify the UN Convention on Shared Water Courses, as such ratification would reflect a willingness to be bound by cooperative incentives, in which agreement over water leads to other things. North America's water treaties—covering fisheries, acid rain, navigation, climate change, the Great Lakes, St. Lawrence and the Columbia Basin—expanded directly from that tiny, focused accord between farmers a century ago.

Yet another reason involves communication: keep talking before, during, and after a project. Prior notification of water development plans goes a long way towards water security. This does not mean nations must obtain consent, or permission, for national interest comes first. To notify is not to end water disputes, or potential

for stress and tension. But it engages both, or all riparian parties, in a frank discussion from which "good faith negotiation" helps define where national interests, for a finite resource, compete and where, like a river or aquifer, they overlap and can be shared. In the treaty between Argentina and Brazil, the very principles that were at issue in the dispute—prior notification and consultation—were enshrined in the agreement that resolved it.

We must also consider gender in turning water into a catalyst for peace. In recent years I have been speaking of what I call the "feminisation of politics and policy." This is not a matter of quotas or tokenism. It is how women transform the decision-making process, they see water less as a weapon or as an economic resource than a basis for their family's health; water to women is something to share, not fight over.

Water also becomes a catalyst for peace over equity. Most treaties that allocate quantity or quality between states, or establish ground rules for management, reflect the principle of equity, or equitable use. This may seem odd, when there is not a perfect balance of power between nations. And the definition of equitable varies from case to case, and according to facts and circumstance. But in this regard water, a potentially renewable resource, can be a common denominator, a leveler in the search for equity. The negotiated result may not be what a national spokesman or leader tells in the press. Between Pakistan and India, or the U.S. and Mexico, both countries announced "they don't have the right to our water," then sat down and work out an equitable solution. Altruism and solidarity, as in the agreement between India and Bangladesh, can provide the basis for future collaboration, if the political will is there. Nations may vow war, then quietly broker equitable water for peace.

Stress and tension may be offset by the variety of options available. In some cases the benefits—irrigation, consumption, power, even recreation—derived from a shared water resource will vary between riparian states, and these needs become grounds for negotiation. Nepal wanted hydropower, India irrigation; South Africa's Johannesburg wanted urban consumption, Lesotho electricity. Those countries united to build dams that split one shared river into diverse benefits.

Water scarce regions, like the Middle East, give rise to a concept of "virtual water," in which grain imports bought with oil or high tech revenues offset the demand for irrigation dams. Desalination plants may be viable where rainfall can't match urban growth.

The mobility of currency, and purchasing power for water, acts as an incentive to make allies of former antagonists. Cash-for-water may also be a catalyst for peace when a third party like the World Bank or Export-Import Bank, or bilateral credit agencies, withhold funds for water development until competing riparian states resolve any and all disputes related to the water allocation.

International water law increasingly plays a role. Many countries are upstream in one case, downstream in another, sometimes with the same countries, or others. Exceptional midstream cases, like Gabcikovo-Nagymaros Dam between Hungary and the Czech Republic, show the complexity and difficulty of legal compliance. But the more participatory the negotiations, the less likely tension over water will escalate, and those that do can resolve their disputes before the International Court of Justice, or the United Nations, with positive results.

No modern wars have been fought over actual use of water. But wars over other issues, like religion or oil, may and do lead to targeting of water supplies and projects. Yet even here water may bring countries together. Protocol I of the 1977 Geneva Convention relating to the Laws of War specifically prohibits any attack on "objects" indispensable to the survival of a civilian population such as food, drinking water installations, and supplies or irrigation works, whatever the motives. Nor, for that matter, shall these be attacked if impacts release, or remove, dangerous volumes of water on civilian populations. This international law dimension reflects the feeling of urgency by the international community and no breach of this provision should be committed in the name of "total war," whether concerned with regional forces or with individual states. Breaching this law must be considered a war crime, whether employed by one side during the Gulf War fought over oil, or by the other during the bombing of Belgrade, fought over culture, ethnicity, and religion.

A final reason is that there is something about water unique from other resources. Despite scarcity, water is renewable; water is dispersed. Water shifts with season and place. Water quantity changes human behavior, and how a nation values it. Some water rich countries come up short of supply, while some water poor countries feel they have an abundance to meet their demands. To cut off water is to cut off human life. We adapt.

I might speculate further that water, and water alone, has an intrinsic spiritual element lacking in oil, gold, gas, copper, uranium, even diamonds. In nearly every culture, religious values are embedded in water, which baptises, purifies, bathes, cleanses. I will not include this reason here; this is a policy lecture, not a theological sermon.

Conclusion: Look Inward

For some of these reasons, nations repeatedly unite over water. In all cases, what could—and by all indications, should—erupt into violence and escalation over resource competition and environmental stress instead healed, like a scar or broken bone, into something stronger than before tensions flared. Hot words over resources were cooled by shared water. The first small water treaties spur later agreements over trade, weapons, transport, communications, or fisheries.

Somehow nations resolve their transnational water stress without the help of great powers. And yet when looking at potential water conflicts elsewhere in the world, superpowers appear to forget their own history. Insofar as Secretary of State seeks to foster the growth of these river-specific treaties through the United Nations, World Bank or International Court of Justice has done in the past, fine. Judicial or multi-lateral dispute settlements is the only way if we are to move away from great power politics that verges on hegemony: "Water War" rhetoric should not replace the vacuum left by the Cold War's end.

For no nations have gone to war strictly over water and, even with supply running low, let me go on record to say that I doubt they ever will. That is not naivete, or even blind optimism. That is a belief—based on our growing awareness of water scarcity weighed against the historical evidence of water as a catalyst for cooperation—that we can infuse each generation who comes with the capacity, understanding, and political will to experience, use and enjoy waters as much as our own generation has….

STATEMENT BY THE BRITISH MINISTRY OF DEFENCE

Excerpts from "The Future Strategic Context for Defence," a document prepared by the British Ministry of Defence and available on-line at www.mod.uk

...THE PHYSICAL DIMENSION

The Environment

10. Global warming is already happening and attempts to stabilise or reduce emissions of greenhouse gases have so far proved ineffectual. Average global temperatures could rise by between 2ºC and 4ºC in the course of the next century. The trend may not be linear, however, and the current gradual rate of warming could shift into a much faster rate or even a temporary period of decline.

11. Among the effects, we can expect to see rising sea levels and extensive flooding of coastal areas (which could cause serious practical and safety issues for some key UK defence facilities and lead to increasing requests for military assistance at home), changes in flora and fauna by region (with implications for traditional agricultural practice), the increased geographical spread of certain types of infectious disease, and an increased incidence of natural disasters associated with extreme weather conditions. Pressure on fresh water and agricultural land will grow, especially in Africa and the Middle East, and can be expected to exacerbate existing tensions and instability in those regions. If present consumption patterns continue, by 2025 two-thirds of the world's population will be living in "water-stressed" conditions. At the same time, widespread degradation of renewable resources (for example forests, fisheries, soils, and water) is likely to continue in the developing world.

12. Water and other resource scarcities may become a source of tension and conflict. Resource scarcities and flooding are likely to prompt population migrations which may place unmanageable burdens on recipient states, many of whose economies are already stressed, whilst inflaming existing ethnic, cultural, or religious tensions. It is possible that global warming will become an increasing source of tension between industrialised countries, which are seen to be the primary source of the problem, and developing countries which bear the brunt of the effects.

Resources

13. We are becoming better at finding, producing, and recycling materials. Diversifying sources of supply and the development of synthetic substitutes and alternative production technologies will continue to weaken the concept of strategic resource dependencies for developed countries. In a crisis, most resource choke-points can already be bypassed. There is little risk that the fundamental interests or security of Western nations will be jeopardised through actions directed against resources or trade. The possible exception is the oil market which, although other sources of supply will become more important, is likely to continue to be largely dominated by the Gulf. Disruptions to Gulf oil supplies could be by-passed in a short-term crisis, provided that good relations with alternative suppliers are maintained. In a crisis of longer duration, alternatives would be difficult

and prohibitively expensive. Only towards the end of the period are alternative energy sources likely to be beginning to challenge the dominance of hydrocarbons.

14. Reserves of fossil fuels are not expected to be nearing exhaustion by 2030, or for some time thereafter, but will become increasingly geographically concentrated. The UK will probably become a net importer of gas during the next decade, and by 2020 we could be importing as much as 90 percent of our gas supplies. The main sources of supply will include Russia, Iran and Algeria.

15. Offshore resources are likely to become a growing source of international dispute and potential conflict, particularly in the Asia-Pacific region. In the developing world, there is potential for aggressive competition for resources as nations seek to industrialise, to cope with population growth, and to meet expectations of an improved standard of living. Increasing industrialisation, often without effective health and safety or environmental controls, will pose significant hazards both to people and to the environment through accidental or indirect damage. Deliberate damage to the environment may also be used as a strategic tool by adversaries.

Demographic Trends

16. World population has risen rapidly to 6 billion. As a result many developing countries have large numbers of people aged under 30, who may be more liable to provoke, and more able to participate in, conflict. But dramatic falls in fertility rates have led the UN to adjust its population projections downwards twice in the past 3 years. Current UN projections suggest a population of around 8 billion by 2030, with the increases almost entirely in the developing world. The UK population is predicted to rise gradually but steadily across the period to 64 million (from 59 million), primarily as a result of increasing life expectancy.

17. Europe's population is getting older. Currently 21 percent of the population of the EU are over 65. This is expected to rise to 34% by the middle of the century, meaning that around two-thirds of the population of European countries will not be "economically active." Accordingly, tax revenues will come under pressure, whilst there will be increased demands on health and welfare spending. In particular, most European Governments (although the UK is not as badly placed as some) are faced with pension liabilities which are projected to rise substantially as a percentage of GDP, making them progressively more difficult to fund from available revenues.

18. In the UK the number of people below the age of 20 is likely to fall by around 500,000 (3.4 percent) by 2010 and by 900,000 (5.9 percent) across the 30 year period. The number of people in the 20-40 age range will fall by 1.3 million (7.9 percent) by 2010 and 1.8 million (10.3 percent) by 2030. Other European countries will undergo even more dramatic demographic change. We will therefore face an even more difficult challenge in recruiting and, particularly, retaining sufficient high quality people in a highly competitive employment market. Within the UK, ethnic minorities will make up an increasing proportion of the population, rising from 6 percent to about 10 percent by 2030. The Armed Forces must ensure that they can attract recruits from all groups within the reducing recruitment pool.

Infectious Disease

19. Since 1973, thirty previously unknown infectious diseases have emerged, notably AIDS, hepatitis C, and Ebola. Other familiar diseases, including tuberculosis, cholera, and malaria, have spread geographically or emerged in new, drug-resistant forms. These trends will continue. AIDS is most obviously prevalent in Sub-Saharan Africa. In countries of Eastern and Southern Africa, the percentage of the adult population infected with the disease varies between 10 percent and 26 percent and these numbers continue to rise. But AIDS is expected to develop into an even more serious problem in Asia where the incidence of cases will overtake Africa by about 2010. AIDS and related infections, notably tuberculosis, are reducing life expectancies in Africa. They also have a serious impact on the development of national economies in the region. HIV/AIDS and other infectious diseases are as prevalent in the armed forces and recruiting pools of African countries as in the general population, and this can affect, for example, the ability of these countries to contribute to peacekeeping operations. The problem of guarding against infectious disease will become an increasingly important consideration for our own forces engaged in such operations.

Urbanisation

20. Already more than half of the population of the developing world lives in urban or semi-urban environments and this proportion continues to rise rapidly. Increasingly, therefore, we can expect peace support and humanitarian assistance operations to involve operating in urban areas. Achieving military objectives whilst minimising collateral damage and casualties, both amongst our own forces and non-combatants, will present significant challenges.

Physical Dimension: Implications for Defence

- Environmental stresses and resource shortages can aggravate social and political tensions, and policies and preventative measures which address these stresses have a role to play in conflict prevention.
- Calls on Western forces to contribute to humanitarian assistance and disaster relief efforts will increase.
- Maintaining influence in the Gulf and safeguarding the security, and promoting the internal stability of regional allies there remains important.

this task in the future.

Preserving peace and an intact environment, and guaranteeing security and prosperity for society are the most important tasks for German policy besides safeguarding democracy. However none of these objectives can be achieved by any one nation acting on its own. In the case of peace this is obvious.

Environmental policy and security policy, like development policy, are separate policy sectors. Providing a healthy environment, securing peace, and ensuring for sustainable development are each valid goals in themselves. Nowadays, however, it is less possible than ever to pursue these aims separately. Development policy and

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Providing a healthy environment, securing peace, and ensuring for sustainable development are each valid goals in themselves. Nowadays, however, it is less possible than ever to pursue these aims separately.
—Ludger Volmer, German Minister of State, Federal Foreign Office

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- Demographic changes will mean that we will have to work even harder to recruit and retain sufficient good quality people from a smaller pool, against strong competition.
- An aging population will add to financial pressures on Western Governments, particularly elsewhere in Europe….

STATEMENT BY LUDGER VOLMER
German State Minister, Federal Foreign Office

Excerpts of Minister Volmer's remarks at the international workshop, "Environment and Security: Crisis Prevention through Co-operation." Berlin, Germany
15 June 2000

Protecting the environment and securing sustainable development will be a more crucial issue for environmental and foreign policy in this century than ever before….In regards to solving global and regional environmental problems, it is only by co-operating that we can achieve our objective. Scientists and engineers have provided us the technical solutions for sustainable development. Helping these on the road to global success is a vital task for diplomacy. Therefore, German foreign policy will have to be even more prepared to take on

environment policy both enter into the overarching foreign policy goal of conflict prevention. Foreign policy and environmental policy both make a contribution towards just and sustainable development, while foreign policy and development policy are also orientated towards the goal of a healthy environment for ourselves and our descendants. The interconnection between environment and security in particular is highly dangerous: wars and conflicts endanger the environment, but environmental problems can also take on an added dimension that turns them into security problems if they are not recognized in time and dealt with in a co-operative manner. The culture of prevention that UN Secretary General Kofi Annan so rightly calls for can really pay off here.

The research seems to be unanimous: environmental pollution and resource scarcity alone do not lead to armed conflicts. Where, however, flash points and unresolved problems in other areas are already present, they have the potential to be the proverbial straw that breaks the camel's back, or the spark that ignites an explosion.

The theme of environment is on the agenda of all international bodies and it is impossible nowadays to imagine the day-to-day business of politics without it. Even organizations that at first sight appear to have nothing to do with the environment are dealing with the subject. In many parts of the world the consequences of population growth and misuse of resources come together in a dangerous combination. The climatic escapades observed in the past few years also compound

these developments. According to a forecast by the German Agency for Technical Co-operation (Gesellschaft fur Technische Zusammernarbeit, GTZ), water availability in many countries will be so low by the year 2025 that water will have to be rationed to private households. More than 40 percent of world food will be produced using artificial irrigation, which will lead to salinization of the soil and dramatic depletion of the drinking water available to the human population. Sixty percent of the world's freshwater resources are owned by a mere nine states. In more than 80 countries of the world there is a shortage of water.

Whereas in the case of water use and soil degradation the cause and the environmental impact remain within regional boundaries, the interactive effects of global climate change are quite another matter. The causes are to be found principally in the industrialized countries of the North, whilst the immediate effects of climate change are borne by the countries of the South. Here we have a particularly striking example of the common responsibility of human beings, but also of the fateful way in which we are all inter-linked. In order to counteract rapid climate change, the industrialized nations and the biggest energy consumer especially must rethink the way they operate….

STATEMENT BY ERICH STATHER
State Secretary, German Federal Ministry for Economic Co-operation and Development

Excerpts from Secretary Stather's keynote speech on "Effective Crisis Prevention: Challenges for German Foreign, Environment and Development Policy," at the international workshop, "Environment and Security: Crisis Prevention Through Cooperation", Berlin, Germany
15 June 2000

We must support partner countries in the South and the East in reducing such potential causes of crisis. Crisis prevention is more humanitarian than the checking of crises and post-crisis rebuilding, and it is also in our own best interests. It is rare for violent conflicts to be contained by national borders, and ecological causes of crisis in particular usually have global repercussions.

The scope of development policy to assist with crisis prevention and conflict resolution is founded on its broad experience in co-operation with partner countries, which normally encompasses a multitude of specialist themes and wide-ranging aspects of society. It can rely on intimate knowledge of the societies and political actors in different regions of the world, based on long years of experience.

Development policy takes on a dual remit within crisis prevention. It sets out to help eradicate long-term causes of crisis, and to reinforce the social mechanisms for a peaceful reconciliation of interests and peaceful conflict resolution.

1. The reduction of long-term structural causes of crisis is a traditional task of development policy. Key aspects of this work include alleviating poverty and reducing social inequality, resource access issues, and safeguarding the natural basis of human existence. An example from the environmental sphere: in development co-operation, the United Nations Convention to Combat Desertification (UNCCD) is of prime importance. It promotes the elaboration of national and regional action programmes for natural resource management and has enshrined in international law the participation of civil society and the co-operation of (signatory) states in partnership to resolve conflicts over land resources—and can be used to enforce such participation. In the most seriously affected countries, we set up our bilateral programmes to secure scarce fertile land resources according to the aims of the Convention, thus making a contribution to the linkage of bilateral and multilateral co-operation. Here—as with many other instruments—there is now potential for embedding the idea of crisis prevention more firmly than ever before.

2. The eradication of structural causes of conflict alone, e.g. by alleviating the scarcity of resources, is of little help if politicians and the socio-political structures are not in a position to find peaceful solutions. The socio-political dimension of conflict resolution therefore requires particular attention. This includes measures such as fostering participation and the functioning of civil society, reinforcing human rights, supporting democracy and the rule of law, establishing competent institutions for justice, industry and development, together with independent media and local capacities for peace. Environmental policy—on the "security and environment" issue—introduces a specialist perspective and develops the appropriate instruments within the regulatory context (e.g. the "clean development mechanism" within the context of the Framework Convention on Climate Change). This form of role-division is valid when seeking solutions on various levels—national, regional

New Population Environment Research Network

The Population Environment Research Network is non-profit, academic, and Web-based information source on current population and environment research worldwide. The network aims to stimulate greater communication about, and the advancement of, methodologies and approaches to population-environment research. We do this through maintaining an up-to-date, on-line, and searchable database of electronically available literature, as well as by hosting occasional cyber-seminars on current research topics. Our target audiences are institutions and individual researchers around the world from disciplines including demography, geography, anthropology, history, political science, ecology, biology, environmental studies, as well as all others interested or actively involved in population and environment research. The Population-Environment Research Network seeks to advance academic research on population and the environment by promoting on-line scientific exchange among researchers from social and natural science disciplines worldwide.

The Network's main activities include:

1. An on-line research database. The database includes "grey-literature" or working papers, bibliographies, project descriptions, and reviews of research on population-environment dynamics.
2. A cyber seminar series. The cyber seminars are on-line discussions of select research papers addressing population and environment topics of current interest.
3. A "What's New?" page highlighting new material, upcoming events and opportunities.

For more information, see http://www.populationenvironmentresearch.org/

and international. Furthermore, our policy areas must be closely coordinated with one another and coherently focused on the joint aim, both domestically—here in Germany—and on the European level—as part of the European Union's common foreign, development and security policy….

STATEMENT BY ALEXANDER DOWNER
Australian Minister for Foreign Affairs

Excerpts from Minister Downer's remarks on "Sustenance and Security—Australia's Multi-Layered Approach" at the Crawford Fund conference on Food, Water and War: Security in a World of Conflict, Canberra, Australia
15 August 2000

We Australians have long counted ourselves lucky to live in a relatively secure corner of the world. Although our neighbours have had their fair share of difficulties, until recent times years of political and economic stability had provided the basis for progress in many areas. Australians shared the benefits of this relatively benign regional environment with our neighbours in South East Asia and the Pacific.

Recent economic and political events in places like Indonesia, East Timor, Papua New Guinea, the Solomon Islands and Fiji show how quickly old assumptions can change. Now, I don't want to exaggerate the region's problems—indeed, most of the positive factors contributing to stability and security have not altered—but the region's outlook is in some respects more uncertain than it has been for many years. We find ourselves, in the words of the Chinese curse, living in "interesting times."

Some of the uncertainty derives from a growing appreciation of the implications that environmental problems have for the vexed issue of food security. Of course, we need to be levelheaded about our approach to these matters. Prophets of Malthusian doom have a long history—dating back to Malthus himself—of getting it wrong. Many of you will also remember the apocalyptic predictions of the Club of Rome and Paul Ehrlich in the 1970s as to what our world would look like in the 21st century. But it is clear, I think, that development and population growth are putting severe pressures on natural resources, as well as causing severe air, water and industrial pollution. And water shortages are a growing problem.

Progress in agricultural technology has given the world the tools to produce sufficient food for everyone, yet over 800 million people around the world remain chronically undernourished today. Two hundred million children under five have protein and energy deficiencies. The largest numbers of people living in poverty are in South Asia and East Asia. Both regions have over twice the number of people in absolute poverty as sub-Saharan

Africa.

More than most other donor countries, Australia has a direct interest in reducing poverty in developing countries. Our future security, more than any other wealthy nation, depends on the success of efforts to promote prosperity in our region. For a number of years, the Australian Government has placed a high priority on helping developing countries achieve food security, an aim that is consistent with the focus of our aid program on reducing poverty….

Water Security

There has been much speculation in recent years about the potential for future international conflicts to arise over competition for water resources and in particular over shared river basins. One recalls the 1995 remark by Ismail Serageldin, Vice President of the World Bank, that "the wars of the next century will be about water."

On the face of it, there is certainly cause for concern. Globally, the availability of fresh water has declined 37 percent in per capita terms since 1970 as population growth and degradation of water supplies has outstripped global capacity to develop new sources. Almost half of the world's land surface lies within watersheds shared between two or more countries, and there are 260 rivers which cross international boundaries.

Not all commentators are worried by the prospect of conflict over water resources. In an article published last year, Aaron T. Wolf poured cold water (if you'll pardon the pun) on the idea of looming international conflict over water. Although there have been some minor conflicts, his exhaustive search of historical records yielded only one example in history where states had gone to war over shared water resources, and that was over 3,000 years ago!

In fact, shared water resources by their very nature have often encouraged cooperation between states, even in times of great tension. For example, the Working Group on Water Resources in the Middle East was the one mechanism that continued to function throughout the Middle East peace process, when other forms of dialogue faltered. And Wolf cites the example of the Mekong River Commission, which continued to operate right through the enormous upheavals of the Vietnam War.

We should of course remain alert to the potential for conflict over water, particularly for conflict within states, but we do need to keep this question in perspective.

But if claims of tension arising from water's availability might be open to challenge, problems derived from water quality are not. Between 10 and 25 million people die each year because of lack of clean water and adequate sanitation. This is where problems with water resources really hit hard, but it is an area where Australia can make progress, investing over $40 million last year on improving water supply and sanitation infrastructure in developing countries. Our approach is based on Australia's long experience of dealing with water scarcity and the expertise we have developed as a result….

STATEMENTS BY HUN SEN
Prime Minister of Cambodia

Excerpts from Prime Minster Sen's remarks at the Ceremony Marking the World Day for Water and the World Meteorological Day
22 March 2001

It is true that water is the most important resource for human being. And there is a saying that "Water is life," and water is the source of development. However, water is also a double-edged sword, which is capable of wrecking havoc to human lives and people's property. We have recently witnessed the worst flooding in 70 years, testifying to the fact that the challenge for Cambodia in the new century is a sound management of water resources and how to use this powerful force of nature to promote development….

In addition to reducing poverty, the Royal Government will face the issues of food security, environmental conservation, the growth of population, and global climate changes, which result in flooding and drought. If they are managed well, these forces could revolutionize the prospects for development and human welfare. However, the same forces are also capable of generating instability, human sufferings and economic crisis that are beyond our control….

Excerpts from Prime Minster Sen's remarks at the United Nations World Food Programme Conference on the Role of Food Aid in Cambodia
8 February 2001

…I wish to share with you my main concepts about the Government's long-term strategy and policy with regard to our top priorities—poverty alleviation and sustainable development with equity in Cambodia—with a focus on agriculture and food security. As you are aware, after more than three decades of war, Cambodia has faced chronic food shortages and widespread

malnutrition. Rice yields in the country have been one of the lowest in the world. Despite significant progress during the last 10 years, rural infrastructure bears all the hallmarks of destruction, disrepair, and neglect. Roughly half of the population of Cambodian children aged zero to five years are malnourished; over 30 percent of the population do not meet their minimum dietary requirement and on

Thus, the government strategy is based on a two-pronged framework:

First, embracing rapid, sustained and equitable agricultural growth;
Second, empowering the poor….

Attention of the Government and the nation should not unnecessarily be diverted into inconsequential and sterile debates on issues like whether HIV causes AIDS or not.
—C.P. Thakur, Union Minister of Health and Family Welfare, India

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average face food deficits ranging from one to two months during the hungry season. This is one of the highest ratios among countries in Southeast Asia. Therefore, improving food security will have a strong impact on the health status and welfare of the rural population….

To ensure rapid realization of our poverty reduction objectives, the poverty reduction strategies are based on three main components:

1. Long-term, sustainable economic growth at an annual rate of 6 to 7 percent;
2. Equitable distribution of the fruits of economic growth between the have and the have-not, between urban and rural areas, and between males and females; and
3. Sustainable management and utilization of the environment and natural resources.

On the basis of our broad strategy, we have formulated the following policy response to poverty: (i) promoting opportunities; (ii) creating security and safety; (iii) strengthening capabilities; and (iv) generating empowerment….

In Cambodia, conditions leading to food insecurity include: chronic poverty due to protracted warfare; weak access to arable land; and rapid population growth, coupled with slow growth in agricultural productivity. This led to stagnant growth of per capita food output. Moreover, the country's infrastructure is still poor and fails to respond to the needs of the economy. Other factors include the prevalence of disease, poor water, sanitation conditions, and other security concerns, such as landmines.

STATEMENT BY C.P. THAKUR
Union Minister (Health & Family Welfare) Government of India

Remarks Made in Press Conference
7 August 2000

In the World AIDS Conference in Durban it was brought out very clearly what type of devastation the unchecked spread of HIV/AIDS can cause to populations of developing countries in Africa and Asia. With infection rates ranging from 20 to 25 percent, some of the sub-Saharan African countries are witnessing an unprecedented epidemic unheard of in modern times. Countries which have made great sacrifices to achieve their independence now find themselves devastated by the relentless spread of HIV/AIDS among the most economically productive sections of their populations. India of late is quoted as a country with extreme vulnerability to a similar explosion of HIV/AIDS. With a large population of one billion we already have about 3.5 million estimated HIV infections in the country. Even though prevalence-wise it represents only 0.35 percent of the population, the pressure it will create on health care system can very well be imagined. Governments, both at the Centre and the States, have now openly acknowledged the threat posed by HIV/AIDS in this decade if immediate steps are not taken for its prevention and control….

While the Government is making all-out efforts for prevention and control, I am distressed to note that discordant voices are heard from some NGOs and disgruntled elements questioning the very basis of the medical evidence of HIV/AIDS and its prevalence levels in various parts of India. They challenge that HIV infection need not necessarily lead to full-blown AIDS. There could be other reasons for causing death due to

AIDS. You must have heard about these theories being advocated by people not only in India but abroad. This hypothesis questions the very scientific basis on which HIV/AIDS virus has been isolated in 1983 and the irrefutable evidence that its continued presence in the human body causes the immune deficiency syndrome AIDS. While these people are entitled to their opinion, government cannot allow itself to be dragged into this sterile debate which in no way will contribute to our efforts in checking the spread of the disease. We can spend a whole life arguing on these points but any slackening of the efforts will ultimately cause immense damage to the people of this country. There may be one or two countries in the world who subscribe to this minority opinion; but most of the countries, both in the developed and developing world, are now busy implementing programmes rather than indulging in endless inconsequential debates. We should not become a laughing stock in front of the scientific community of the world which has effectively established the connection between HIV and AIDS and its manifestations….

Finally, I would like to appeal to the media to realize how important it is for the country to concentrate on efforts to prevent the infection from spreading further in various parts of the country. AIDS control is a lot similar to the population stabilization programme in which governmental efforts have to be equally matched by the society, the NGOs, business organizations, and most importantly, the elected representatives of the people at various levels. I feel that the next three years are going to be very crucial for the programme. Attention of the Government and the nation should not unnecessarily be diverted into inconsequential and sterile debates on issues like whether HIV causes AIDS or not. We do not have any time to lose on such non-issues.

STATEMENT BY NKOSANZA DLAMINI-ZUMA
South African Foreign Minister

Excerpts from Foreign Minister Zuma's remarks at a press conference with U.S. Secretary of State Colin Powell, Pretoria, South Africa
25 May 2001

I think it is very important for the outsider, in particular, to understand that in South Africa we are very concerned about the welfare of our people. We don't think outsiders are more concerned than we are. We came

RIO+10 AND ECSP

Johannesburg 2002: The World Summit on Sustainable Development (also known as *Rio+10*) will gather concerned citizens and representatives of United Nations agencies, multilateral financial institutions, and world governments in Johannesburg, South Africa in September 2002 to assess global change since the historic United Nations Conference on Environment and Development (UNCED, also known as the "Earth Summit") of 1992.

Rio+10 aims to answer the following questions, among others: What has been accomplished since 1992? What have participating countries done so far to implement Agenda 21 (the UNCED program for reaching worldwide sustainable development), the National Sustainable Development Strategies, or the conventions that aim to prevent loss of biodiversity or ensure women's rights? What obstacles have these countries encountered, and what lessons have they learned? Where should further efforts be concentrated?

Throughout the months leading up to *Rio+10*, ECSP will undertake programming that facilitates discussion pertinent to the themes of this critical international conference. ECSP *Report* 8 will feature commentaries on the state of the environmental, demographic, and human security fields as well as global progress towards the goals of UNCED.
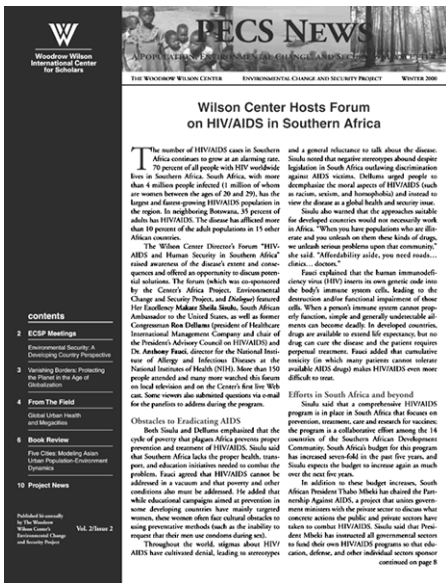
Now Available: PECS Summer 2001

Featured event summaries in this issue of the PECS Newsletter include:

♦ The release of the 2001 IFAD Rural Poverty Report

♦ ECSP's screening of the documentary "Urban Explosion"

♦ Sir Crispin Tickell's presentation on Resource and Population Pressures.

into government only seven years ago and at that stage there was hardly anything done by the government about AIDS, even though they knew AIDS was there in the community. The AIDS budget was very small at the time. If you look at what we have done in that seven years just in AIDS alone, you would realize that we take this matter very seriously.

But I think the outside world is missing the point about AIDS, particularly those who think we are not doing enough, because they are basing their assessment only on anti-retroviral drugs—whether we are giving anti-retroviral drugs to our people. And in our view, it is a very small proportion of dealing with the AIDS epidemic and if we thought that that was the major aspect of dealing with the AIDS epidemic we would do it. But we don't think so. We think dealing with the AIDS epidemic in South Africa and elsewhere, the major, major attention should still go to education. Young people must know about AIDS, they must know how to prevent themselves from getting the infection. That's the major aspect.

The second aspect, in our view, is to make sure that people de-stigmatize and de-mystify AIDS. So that people begin to understand that AIDS is a disease that they can talk about, that they can be compassionate towards people who are living with AIDS and in that way even people who are living with AIDS would be much more helpful in the campaign. But if they are stigmatized they will always hide and therefore be unable to play a healthy role in dealing with HIV/AIDS.

But I think we must also understand that HIV/AIDS as an immune disease is very linked to poverty in the sense that your nutritional status, your well-being, plays a very critical role in how fast you deteriorate from just being HIV positive to having full-blown AIDS and dying. And therefore, if we do not improve the material conditions of our people and particularly those who have the infection, if we can't improve their nutritional status—like all diseases, it's not just unique to AIDS—whether you are talking about measles or something else, a child who is healthy, well-fed, you give them an infection of measles and you give another one who is malnourished, the malnourished one will probably die whereas the healthy one might not even need to go to hospital or to a doctor, might just have a transient fever, a few spots here and there and run around and be okay.

So, you have to look at this problem in a holistic view. Even when you come to drugs that are needed for treating people with AIDS, the most important drugs, in our view, are still not the anti-retroviral drugs but they are the drugs that treat the opportunistic infections to which most people, who are HIV, and are succumbing, whether it is TB, pneumonia, diarrheas or whatever those opportunistic infections are. Because if you haven't got those drugs to treat those opportunistic infections then people will get an infection and die. So it is very important, and that's why we thought the outside world was very hypocritical when we were trying to bring a law to make access and affordability to those drugs that are life-saving even for people with HIV were opposing us. And we did not get a lot of support initially from a lot of countries in fighting that battle, but I am glad to say that eventually we did get support and that battle was won. But it was precisely to deal with all those problems and you can't, therefore, just zero in on anti-retroviral drugs and say this is what makes or breaks the HIV/AIDS campaign….

GREEN NGO AND ENVIRONMENTAL JOURNALIST FORUM
9-10 APRIL 2001
Hong Kong Jockey Club Beas River Country Club Resort

Sponsored by
The Centre for Asian Studies, University of Hong Kong
The Woodrow Wilson Center for International Scholars
The Journalism and Media Studies Centre, University of Hong Kong

The "Green NGO and Environmental Journalist Forum" was held in Hong Kong on 9-10 April 2001. This two-day workshop brought together for first time environmental NGO activists and journalists from Mainland China, Taiwan, and Hong Kong.

The workshop, in which Mandarin Chinese was the primary language, promoted information exchanges and provided opportunities for 65 participants from Mainland China, Taiwan, and Hong Kong to discuss improving NGO capacity and the quality of environmental reporting in the region. The workshop also promoted dialogues to help these activists and professionals better understand each other's work and to investigate joint activities.

On the second day of the conference, NGO participants role-played that they were environmental NGOs, trying to pitch a green campaign to journalists. In this picture, journalists evaluate the NGO presentations and explain whether they would report the story. Left to Right: Zhu Zhongqi (Guangdong Daily, China), Nailene Chou Wiest (Journalism and Media Studies Centre, Hong Kong), Sun Xuan (Guangdong Sheng Yangsheng Wanbao, China), and Olga Wong (Ming Pao Daily, Hong Kong).

After the opening session, which compared the environmental movements in Mainland China, Taiwan, and Hong Kong, the participants heard presentations and held discussions on environmental education methods, NGO partnerships and networking, and a comparison of environmental journalism in Greater China.

The second day of the conference consisted of two in-depth workshops. In the journalist workshop the participants listened to a presentation on the impact of air pollution on human health and discussed how they could improve their reporting on air pollution. In the NGO workshop, the participants broke into small groups to exchange information and techniques for promoting public participation in their environmental activities, expanding their use of the internet, and exploring how to better utilize their limited funds to undertake environmental activities. The two workshops joined together on the last afternoon for a lively "Journalist and NGO Dialogue."

The Woodrow Wilson Center received generous support from the United States Institute for Peace to support this forum.

Bilingual forum proceedings will be available in the fall of 2001. For more information on the forum or the proceedings see the Environmental Change and Security Project Web page (http://ecsp.si.edu) or contact Jennifer L. Turner at chinaenv@erols.com.

BOOK REVIEWS

Environment and Security: Discourses and Practices

Miriam R. Lowi and Brian R. Shaw (Editors)
New York: Palgrave, 2000. 225 pages.

Reviewed by **Jon Barnett**

In the last three years there has been considerable diversification within the literature on environment and security. Earlier "first" and "second" waves of scholarship were dominated by North American political scientists such as Thomas Homer-Dixon and politicians such as Warren Christopher, and were supported by a handful of like-minded environmental scientists such as Norman Myers.[1] This research had two principal characteristics: (a) somewhat superficial explorations of possible (rather more than actual) environmentally-induced conflicts; and (b) a strong emphasis on nation-states as the primary security referents and actors.
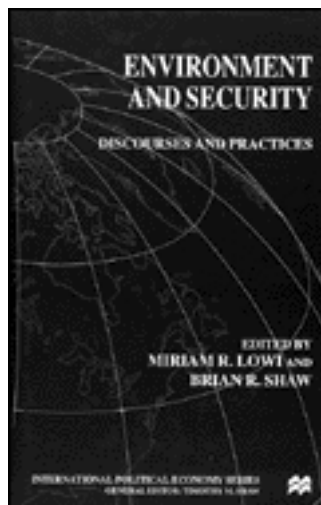
These earlier waves were always challenged by human security advocates and critics from cognate disciplines who argued that people's legitimate day-to-day needs go beyond those provided by nation-states (see Barnett, 2001; Dalby, 1999; Tickner, 1992; and Walker, 1993). They argued that to achieve environmental security, fundamental reform of modern beliefs and institutions—of which national security is one—is needed. Further, critics of the earlier waves of environment-conflict research found it to be driven more by the ideological predilections of authors (which tended towards the hypothetical rather than the empirical) and overly sensationalist in nature (Barnett, 2000; Deudney, 1992; and Gleditsch, 1998).

A "third wave" of environment-security scholarship can now be discerned. It is characterized by: (a) greater contributions from diverse disciplines; (b) a partial decoupling of security from conflict and states; (c) more detailed empirical investigations of local and regional cases, with greater recognition of their temporal and spatial dimensions; and (d) more attention to matters of both method and discourse. This new pluralism is at last producing environment-security scholarship that is consistent with (and at times equal to the best of) contemporary non-security related studies of environmental change from across the social sciences. With this has come the welcome prospect of a meaningful and genuinely useful discipline.

More than any other single volume, *Environment and Security: Discourses and Practices* embodies this "third wave." With few exceptions, Miriam Lowi and Brian Shaw have assembled a collection of excellent papers that in sum make this the most concise and useful edited collection on environment and security since Jyrki Käkönen's 1994 *Green security or militarized environment*. The editors aim to advance discussions of environment and security beyond general linkages and issues of conflict; they include more exploration of the complex relationship between environmental change and security by drawing on more disciplines and perspectives. In this respect, the book aims to develop the "third wave" of environment-security scholarship while not explicitly acknowledging it.

Environment and Security contains ten chapters plus a useful introductory chapter by Lowi and Shaw. The ten chapters are split evenly among "discourses" and "practices." The book claims to represent an "interdisciplinary community, composed of both academics and practitioners" (page 3). This claim has some justification, as among its sixteen contributors there is a fair representation from non-political scientists (including a welcome and excellent chapter by anthropologist Michael Thompson), and practitioners from the U.S. security bureaucracy are also represented.

The chapters from the environmental social scientists Simon Dalby, Steve Lonergan, Elizabeth Malone, Steve Rayner, and Aaron Wolf are a strength of the book. For too long, environment and security scholarship has ignored these and other scholars' work on the human dimensions of environmental change. *Environment and Security* also

offers two new cases for environment-security research from South Korea and the Himalayas as well as discussions of transboundary water dispute resolution and water issues in the Middle East, South Asia, and the Aral Sea Basin. While it is too much to ask from this volume, prospective editors of future collections might seek more contributions from beyond North America and from "practitioners" beyond the national security bureaucracy (to include representatives of local communities, intergovernmental organizations, and NGOs).

The chapter by Margaret Evans, John Metz, Robert Chandler, and Stephanie Eubanks on "The Changing Definition of National Security" unwittingly highlights the challenge states face in accommodating this third wave of environment and security thinking. The authors write from the vantage of state security bureaucrats, and promote a preventive-defense approach using the analogy of preventive medicine (although the question of why the United States seeks to be "global doctor" is not satisfactorily addressed). Practicing this preventative defense is seen to require (a) recognizing non-military factors in conflict, (b) assessing possible courses of action, and (c) intervening at key points to prevent conflict from unfolding. However, this approach is more surgical than medicinal. It focuses on symptoms rather than causes, and relies on the certainty of models and the judgements of experts. And, as the book's excellent chapters by Rayner and Malone, Lonergan, Lowi, Sergen and Malone, and Thompson all demonstrate in various ways, such models of conflict are epistemologically flawed and incapable of predicting the actual occurrence of conflict.

Even more importantly, these other authors all show that the prevention of environmental insecurity—however we may define it—is less a matter of strategic intervention at key junctures and much more a matter of building up social capital, institutional capacity, and overall social resilience to manage environmental change. The inverse of their collective argument, then, is that it is not just environmental change *per se* that undermines environmental security. Rather, it is environmental change *in combination* with the broader political economy processes of impoverishment and underdevelopment that simultaneously undermines social institutions at the same time as it degrades local environments (Barnett, 2001). Practicing environmental security is therefore less a matter of seeking to effect positive changes in supposedly vulnerable places and more a matter of ending those processes that create that vulnerability.

This continuing shift away from considering environmentally-based insecurities in isolation and towards recognizing broader social vulnerabilities and their global causes is a hallmark of the third wave scholarship. Its challenge to the modern Western state and its bureaucrats (such as Evans et al.) is that discussions of environmental security can no longer ignore the role of the globalized but largely U.S.-led international economy in generating local insecurities of all kinds. This point is forcefully made both in Dalby's chapter in this book ("Geopolitics and Ecology") as well as more broadly in Michel Chossudovsky's 1998 *The globalisation of poverty*. The deeper imminent contradiction exposed by this third wave is precisely this: that the more scholars focus on the causes of environmental insecurity, the more the state (and particularly the United States) becomes the problem rather than the loci of solutions. Specifically under scrutiny here are those U.S. trading practices that affect underdevelopment and the unwillingness of the United States to implement global environmental agreements. Whether the U.S. policy community takes this point on board may well determine the future policy-utility of environmental security. Acknowledgement of such a contradiction might well effect a profound change in U.S. foreign policy, steering it toward a meaningful commitment to peace and security worldwide. Failure to acknowledge it will render U.S. policy in this area increasingly disconnected from research.

The combination of perspectives and cases contained in *Environment and Security* perfectly outlines the theoretical and empirical content of the third wave of environment and security scholarship and its challenges to policy. This is an excellent and useful book that deserves to be on the shelves of anyone seriously interested in contemporary developments in environment and security research.

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ENDNOTES

[1] See Levy (1995), 35-62 .

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# New Conference Proceedings Volume

Protecting Regional Seas: Developing Capacity and Fostering Environmental Cooperation in Europe

Stacy D. VanDeveer and **Geoffrey D. Dabelko**, Editors

On 14 May 1999, the Woodrow Wilson International Center for Scholars assembled a group of scholars and practitioners to discuss the similar challenges of pollution that undercut the marine ecosystems and the economic potential and health of surrounding human populations of the Baltic, Mediterranean, and Black Seas of Europe. Entitled "Saving the Seas: Developing Capacity and Fostering Environmental Cooperation in Europe," the conference was held at the Center in Washington, DC. This conference proceedings volume reflects the scholarship and debate featured at that conference and contains chapters that compare and analyze the state of environmental management in each of the three regions including the structure, funding, and effectiveness each sea's protection program. The hope for the conference and of these proceedings is that scholars and policymakers may draw valuable lessons for replicating success stories and avoiding failed pathways for future environmental management programs.

Generous funding for *Protecting Regional Seas: Developing Capacity and Fostering Environmental Cooperation in Europe* and the May conference was provided by the Woodrow Wilson Center and by the U.S. Agency for International Development's Office of Population through a cooperative agreement with the University of Michigan Population Fellows Programs.

For more information or to obtain a copy of the conference proceedings volume, please contact the Project at (202) 691-4130 or by email at ecspwwic@wwic.si.edu.
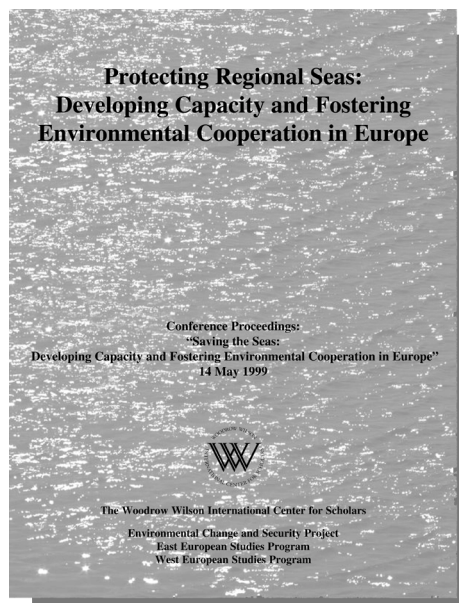
States, Scarcity and Civil Strife in the Developing World

By Colin Kahl
Doctoral Dissertation. Columbia University. 2000.

Reviewed by **Jack A. Goldstone**

It is a shame this doctoral dissertation is not yet in print as a book; everyone who is interested in the next steps forward in understanding the links between environment, population, and civil conflict should be reading it.

While Thomas Homer-Dixon (1999) and the Toronto school have argued that environmental scarcity can lead to conflict, and I have argued that population pressures on recalcitrant economic and political institutions can lead to crises (Goldstone 1999, 2001), other scholars have claimed that economic and political factors are more important to issues of conflict and regime stability (Gleditsch, 1998). Kahl moves us strongly forward in these debates, integrating environmental and demographic concerns and then tackling the more difficult question of *which* mediating economic and political conditions make it most likely that demographic and environmental stress will lead to civil strife.

Kahl begins with a thorough review of not only the literature on environmental security, but also of current scholarship on internal wars. Too much of the writing on environmental security has focused on environmental pressures that *could* lead to political crises. Kahl improves the balance by also examining key issues that scholars working on more conventional analyses of security have shown are frequently involved in such crises: failures of state capacity, internal security dilemmas, and ethnic rivalries. Kahl skillfully brings together the literature on environmental and population stresses with the mainstream literature on the sources of internal wars.

He then provides detailed case studies of the rural communist insurgency in the Philippines and ethnic clashes in Kenya to delineate his models of population change, environmental scarcity, and strife. The conclusion provides additional illustrations—including one of the best accounts I have seen of the factors behind the genocide in Rwanda—from throughout the developing world.

Kahl's major insights involve the pathways by which demographic and economic stress lead to different types of conflict. He points to two major pathways: state *weakness* and state *exploitation*.

State weakness involves an erosion of state administrative effectiveness, caused either by lack of adequate fiscal resources or by welfare or security burdens that are beyond the capacity of the government to manage. Rapid population growth or degradation of important physical resources can contribute to both conditions. Weak states are unable to provide key welfare and security services to the population. When a state is inattentive to or ineffectual against landlessness, rising unemployment, or rapacious landlords that threaten a portion of the population with destitution, the way is open for guerrilla movements to provide an alternative to that state.

In the Philippines, the New People's Army filled the void left by the government's weakness in rural areas, providing employment and protection in return for allegiance to its anti-government campaign. Similar conditions provided opportunities on a smaller scale for the Zapatistas in Chiapas, Mexico. This notion that state weakness leaves governments vulnerable to opposition movements is not new. However, Kahl also shows that, where ethnic cleavages exist, state weakness creates a security dilemma; absent the power of the state to curb conflicts, any group is vulnerable to the depredations of another. State weakness thus creates a Hobbesian state in which ethnic conflicts that might be dormant under strong governments roar into the open in pre-emptive attempts to secure group survival or dominance.

These ethnic conflicts are often inflamed by state exploitation. In order to divert attention from its weakness, to gain allies, or simply to divide its opponents, states suffering from administrative weakness often deliberately fuel ethnic or regional strife. This tactic may take the form of (a) supporting the claims of one particular ethnic group identified with the state, or (b) supporting various groups in order to keep ethnic conflicts going as a distraction and justification for increasing state power. The former practice is all too recurrent in Rwanda and Burundi, and has been increasingly adopted by the Mugabe regime in Zimbabwe. The latter practice has been skillfully employed by President Moi in Kenya.

Kahl then looks further into the nature of states to ask if other conditions determine whether state weakness and state exploitation are more or less likely to have these dangerous effects. He finds that the impact of demographic and environmental stress on state actions is mediated by two broad structural characteristics of society, which he labels "groupness" and "inclusiveness." A society with strong "groupness" has clear identity divisions that make it easy to mobilize groups independent of the state—be they ethnic, regional, or religious groupings. The combination of all three (as exists in the former Yugoslavia) seems particularly dangerous in

times of state weakness. While a society with high "inclusiveness" has a large degree of political participation and wide circles of actors with influence on state policy, a society with low inclusiveness has discriminatory or sharply curtailed political participation and few avenues for influencing state actions. Either high groupness or low inclusiveness tends both to magnify the adverse consequences of state weakness and to facilitate state exploitation.

The Philippines under Marcos provides a textbook case of low inclusiveness. Kenya under Moi provides a clear case of high groupness compounded by low inclusiveness–*except* in the country's cities. One of the most interesting twists of Kahl's work is that it provides an explanation for why Kenya (despite severe environmental and demographic stress as well as continuing ethnic conflict and democratic struggles against Moi) has not exploded in violence to the degree that other countries in Africa have experienced. Kahl points out that, in Kenya's cities, there is actually rather *low* groupness and *high* inclusiveness. Although Kenya's democratic institutions are faulty, these institutions are more active in the cities, and different ethnic groups from throughout Kenya have come together in urban settings to seek solutions to Kenya's problems. The result is that, while Moi has been able to stir up ethnic strife in the rural areas and to use such strife to reinforce his claims to power, the cities remain a center of democratic opposition rather than revolutionary violence.

This short review cannot do justice to the richly detailed and sensitively nuanced case studies that Kahl provides, nor to his elaborations of the concepts I have mentioned. This research is one of the most sophisticated and promising approaches to the issues of demographic and environmental security I have seen. We should hope for a book to appear fairly soon, but in the meantime I would urge interested scholars to obtain the microfiche of this dissertation and to learn from its insights. **W**

Jack A. Goldstone is professor of sociology and international relations at the University of California at Davis. He is the editor of The Encyclopedia of Political Revolutions, *and recently published "Population, Environment, and Security: An Overview" in Myron Weiner and Sharon Stanton Russell (Eds.),* Demography and Security *(Oxford: Berghahn Books, 2001.)*

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Environmental Conflict

Paul F. Diehl and Nils Petter Gleditsch (Editors)
Boulder, Colorado: Westview Press, 2001. 343 pages.

Reviewed by **Bryan McDonald**

*E*nvironmental Conflict identifies and addresses theoretical and empirical deficiencies in the research on relationships between environment and conflict. This volume grew out of a series of papers originally prepared for a 1996 NATO workshop on "Conflict and the Environment," and also contains revisions of articles that appeared alongside the conference in a 1998 special issue of the *Journal of Peace Research*. The book is a thoughtful and important attempt to refine understandings about the relationships between environmental factors and conflict. For those who have followed the debates about environment and conflict research there is much that will be familiar; those new to the field will find the book a well-balanced introduction to environmental security concerns.

As Diehl and Gleditsch recognize, there is a long tradition of claims that environmental factors have been responsible for wars in the past and could contribute to wars in the future. Despite the existence of such claims, Diehl and Gleditsch find that "it was not until the recent emergence of environmental issues on the international political agenda that more specific claims about environmental disruption and violent conflict emerged" (page 2). But even with the development of such claims,

the editors argue that research conducted on relationships between environment and conflict (what Diehl and Gleditsch describe as the environmental security field) has too often focused on conceptual and definitional issues to the detriment of more theoretical and empirical efforts to explore the causal linkages. This book aims to address these shortcomings by highlighting efforts to explore empirically testable theoretical claims about the relationship between environment and conflict.

Environmental Conflict contains an introduction and twelve chapters, five of which were prepared for the book and seven of which are updates of previously published works. The volume is divided into three parts. Part I contains six largely empirical chapters which consider the causal role of environmental degradation in conflicts. The section begins with a chapter by Valerie Percival and Thomas Homer-Dixon that provides an updated consideration of the relationship between environmental scarcity and violent conflict using the case of South Africa. Wenche Hauge and Tanja Ellingsen then respond to concerns raised in the Phase II findings of the CIA's *State Failure Task Force Report* (State Failure Task Force, 1999) about their quantitative test of Homer-Dixon's causal model of environmental factors and civil conflicts. Subsequent chapters include: Jaroslav Tir and Paul F. Diehl's consideration of the relationships between demographic pressure and interstate conflicts; Jack Goldstone's presentation of a more dubious view of the relationship between environment and conflict amidst an examination of the role of population changes in contributing to security concerns; and an examination by Steve Lonergan of rhetorical claims and empirical evidence about the possibility of conflicts induced by water scarcity. Part I concludes with a chapter by Bjørn Lomborg which refutes doomsday scenarios of the worsening state of the environment and contends that many of the resources relevant to environment and conflict research are becoming more abundant rather than scarcer.

Part II of *Environmental Conflict* aims to redress a deficiency of research into the possibility that environmental degradation could foster cooperative responses. The section begins with chapters by Manus Midlarsky on the relationship between democracy and the environment and by Rodger Payne on the role of sustainable development in both addressing environmental degradation and preventing environmentally triggered conflicts. David Denoon and Steven Brams then explore the development of a fair settlement for the Spratly Islands Conflict. Part II concludes with Ken Conca's examination of the potential for environmental degradation to foster international cooperation. Building on the mixed empirical and theoretical findings of Part I, Conca writes that, while there is no guarantee that greater international environmental cooperation will promote peace, "there is a theoretical foundation for the claim that environmental cooperation can promote and enhance peace" (page 245). The articles in Part II reveal a rich variety of research on environment and cooperation that has heretofore been largely neglected by environment and conflict research.

By way of conclusion, the authors of two chapters in Part III reflect on the past and future of environment and conflict research. The chapter by Nils Petter Gleditsch is a broad and critical look at directions in methodological and theoretical research on the environmental causes of conflict; it also identifies nine common problems that must be addressed to further the study of the environment conflict nexus. The final chapter by Daniel Schwartz, Tom Deligiannis, and Thomas Homer-Dixon takes issue with some of the criticisms raised in Gleditsch's chapter, and offers suggestions for future directions of research on environment and conflict.

As a whole, *Environmental Conflict* provides a needed overview of the findings and theoretical directions present in environment and conflict research. While it is not the stated intention of the volume to address the conceptual debates over the breadth of the "so-called environmental security field" (page 2), the discussions contained in *Environmental Conflict* nevertheless provide support for broadening the scope of research in environment and conflict to a more inclusive set of concerns related to what this volume refers to as "environmental security." The concerns include: (a) research into the possibility that environmental degradation may engender cooperative responses, (b) explorations of various forms of human vulnerability to environmental scarcities, and (c) social adaptations to environmental stress.

While the book's case studies of cooperation arising from environmental degradation greatly increase the utility of *Environmental Conflict*, other aspects of environmental
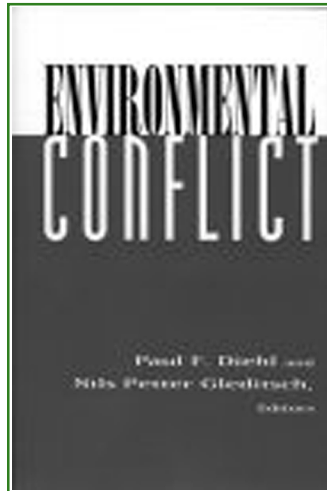
security research—such as the role of human efforts to adapt to environmental degradation in preventing or forestalling conflict—are largely absent from the volume. Such areas of research may be vitally important to achieving the volume's goal of understanding the casual linkages between environmental factors and conflict. Recent research into the social impacts of environmental degradation conducted by the Global Environmental Change and Human Security (GECHS) project office at the University of California, Irvine suggests that cooperation or adaptation are often more probable long-term outcomes of environmental change than violent conflict. For example, an examination of the impacts of environmental stress on small island states revealed a number of adaptive mechanisms that states use to address environmental degradation, including international trade and the development of regional governance regimes (Matthew & Gaulin, 2001). Adaptations also occur at the micro or individual level and can include shifting gender roles or the introduction of new technologies such as solar ovens. Relationships between ecological systems and social factors are highly dynamic; and while ecological change may interact with social factors to affect quality of life, only rarely do societies lose all adaptive capacity and collapse into violence.

Nonetheless, this valuable book shines an important spotlight on research into the explanatory role of environmental factors in intrastate and interstate conflicts, a research direction which has received a good deal of attention in the field of environmental security. *Environmental Conflict* provides a broad and foundational overview of empirical and theoretical research into the relationships between environment and conflict and environment and cooperation. It follows in the tradition of Deudney and Matthew's *Contested Grounds* and Lowi and Shaw's *Environment and Security* in providing a range of insights (Deudney & Matthew, 1999; Lowi & Shaw, 2000). However, unlike the work by Duedney and Matthew, *Environmental Conflict* does not consider the way its subject ties into larger theoretical issues in political science and international relations. And unlike Lowi and Shaw's volume, it does not bring together academic researchers and policymakers. It is most useful as an empirical overview of research on environment and conflict, and raises important issues for future research in environmental security. The volume is useful for researchers, but should not be overlooked by those seeking an introduction to the field for teaching purposes.

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The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era

By Jon Barnett
London: Zed Books, 2001. 184 pages.

Reviewed by **Geoffrey D. Dabelko**

Perhaps a more appropriate title for this book would be *The* Meanings *of Environmental Security*. In it, Jon Barnett highlights how a *diversity* of conceptions (and fierce competition among them) constitutes "environmental security." Barnett also questions these conceptions and the consequences of their profile in policymaking circles, making the book a broadly valuable contribution to the field.

Diversity and Inclusion

Cataloging environmental security's myriad iterations may at first glance appear a modest endeavor. Yet the field has had precious few examinations of its differences, and fewer still as thorough as Barnett's. Barnett rightly emphasizes that one's interest in (and endorsement of) any of environmental security's competing tenets depends in no small measure on one's position—culturally as well

as institutionally. While his groupings are not original— (1) efforts to redefine security, (2) theories about environmental factors in violent conflict, (3) the environmental security of the nation, (4) the linkages between military and environmental issues, (5) the ecological security agenda, and (6) the environmental security of people—Barnett's in-depth presentation enables the reader to see fresh connections and symmetries across the broad environmental security field. In addition, his discussion of the "securitization" of environmental politics cuts across these traditional categories and closely connects this dynamic with the institutional history of environmental security policies and ideas.

Despite this diversity and the breadth of linkages it implies, Barnett believes that issues of equity, justice, and human well-being remain too often outside environmental security debates. In *The Meaning of Environmental Security,* he critiques much of the field's discussions—particularly those in the developed North and situated within the more statist and realist assumptions of security—for not seriously considering equity issues. He adopts a pessimistic view of many Northern enunciations of environment and security linkages, often viewing them as antithetical to a cooperative "Green Agenda" that fundamentally tackles the root causes of environmental decline. Barnett also asks rhetorically if current dominant environmental security concepts do not in fact impede attempts to achieve the interrelated values of peace and justice. In this way, his analysis has its antecedents in the works of Daniel Deudney, Ken Conca, Ole Wæver, Matthias Finger, Wolfgang Sachs, Vaclav Smil, and Jyrki Käkönen. By Barnett's own characterization, his book is a normative attempt to insert these considerations fundamentally into the linkages of environment and security.

As part of an attempt to reconstitute environmental security, Barnett also argues that analysts should ask not *how* the environment contributes to conflict but *why* the focus is on such a linkage in the first place. He blames Northern interests for using the dramatic subject of conflict to deflect attention from root causes of environmental degradation that relate directly to Northern consumption practices. Under the first paradigm, the

Resource Wars: The New Landscape of Global Conflict
Michael T. Klare
New York: Metropolitan Books. 20001. 289 pp.
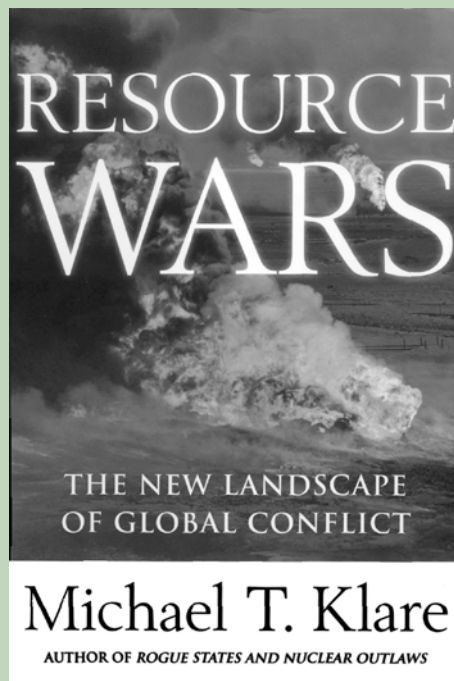
With rapid population growth and economic expansion driving excessive energy demands and dwindling supplies of natural resources, *Resource Wars* predicts that future global conflicts will increasingly occur over access to and supplies of vital natural resources and less frequently occur over ideological differences representative of the Cold War. Author Michael T. Klare, an expert on the changing nature of warfare who has previously written on small arms/light weapons and rogue states, argues that national power now resides with a powerful domestic economy that possesses a strong capacity for technological innovation and the export of high-tech goods. The book presents the reader with valuable information from a range of primary government, military, and industrial source materials to support the author's claim that nations are more frequently defining national security in terms of resource security in oil, water, minerals, and timber.

Resource Wars covers a wide-range of conflict over essential materials including: oil conflicts in the Persian Gulf and South China Sea; energy conflict in the Caspian Sea Basin; water conflicts in the Nile Basin, Jordan, Tigris-Euphrates, and Indus River Basins; and minerals and timber conflicts within national borders.

enemy has instead become instability (or "anarchy," to use Robert Kaplan's hyperbolic term from the 1994 *Atlantic Monthly* article of the same title) (Kaplan, 1994). The threat then is seen to emanate from the South, outside Northern borders, and not from within, from developed country consumption patterns in a globalized economy. Barnett is correct to highlight the inability of many meanings of environmental security and the institutions that act on them to speak to Northern environmental practices or impacts. The field's literature has largely been divorced from the trade and environment debates, from consumption critiques, and from the divisive global issues of climate change and biodiversity loss.

Has Power Corrupted Environmental Security?

Barnett also focuses on whether the absorption of environmental security concepts into environmental, diplomatic, and security policies in a host of countries has compromised critical thinking about these concepts. Barnett argues that these tenets and paradigms have in fact been deeply adopted within security policy structures, blunting fundamental questions about their validity and utility. Barnett is perhaps overstating the amount of institutionalization and acceptance of environmental security within at least the U.S. government (the case this reviewer knows best). But his basic concern is sound. It is precisely *because* environment and security ideas now resonate within government and policy circles that observers should continue to question, probe, and debate their meanings and implications.

Barnett further maintains that there is also a "pervasive silence" on the inverse of environmental security—that is, environmental insecurity. The heavy engagement of environmental security by some government actors (particularly militaries and intelligence communities) leads Barnett to argue that there is precious little focus in either research or policy on the individual as the object of security (human well-being); instead, the realist conception that the state is the object to be secured remains dominant. These government actors, Barnett asserts, are primarily interested in the *symptoms* of environmental degradation or depletion (i.e., their contributions to instability) rather than the *causes*—thus keeping the state as the near-exclusive center of concern. As Barnett puts it when critiquing the environment and conflict thesis: "[T]he issues that ought to be of more concern are the day-to-day insecurities associated with the erosion of individual and group welfare and resilience" (page 64).

But one could also argue that another kind of insecurity should be the focus of environmental security. The field's heavy emphasis on environmental degradation as cause and effect of conflict could be coming at the expense of research into cooperative, peace-building efforts to deal with transboundary environmental stress. In this view, environment and conflict linkages capture only the secondary and causal impacts of environmental insecurity. Very little systematic thought in the research or policy community has been devoted to identifying the *mechanisms* by which environmental security can be achieved within and across states. What are the peacemaking potentials of environmental politics?

Indeed, the failure to tackle peacemaking, cooperation, or confidence-building has both analytical and practical costs for the current study and practice of environmental security. Analytically, the exclusive focus on causal roles in conflict has not significantly advanced knowledge about economic, political, and social variables that might help societies or states avoid conflict. The environment and conflict field has started to address this shortfall with its increasing attention to capacities, vulnerabilities, or "ingenuity gaps" operating among a host of independent variables contributing to conflict and the dependent variable of violent conflict. Researchers must continue working on these next steps for understanding conflict by analyzing the inverse— environment and peace.

From a practitioner or policy perspective, finding the means to address insecurity, foster peace, and insert justice into the equation of environment and security hinges on identifying intervention points for conflict prevention, equitable development, empowering programs, and active cooperation. While there are competing toolboxes for the provision of "environmental security," too often policymakers have not chosen the toolbox containing environmental cooperation, development assistance, livelihood strategies, health and family planning, and girls' education.

It is critical to ask whether environmental security is meant to be an overarching paradigm for addressing (or, as Barnett maintains, intentionally not addressing) environmental challenges. Or is "environmental security" a flag of convenience for a set of subquestions or topics that are largely unrelated and do not compose a paradigm? It is both true and self-evident, for example, to say that the U.S. Department of Defense wants to (a) avoid acting to address root causes or (b) focuses on only conflict and the symptoms of degradation. But the military may be able to play limited but constructive and proactive environmental security roles. For example, Barnett suggests that the Australian Defense Forces

participate in an integrated surveillance system to monitor wildlife trafficking and introductions of alien plant species in ecologically fragile Northern Australia. At the end of the day, however, the military pursues a different mission with different tools than those that fundamentally address environmental problems.

It is also worth recalling that the analysts who forcefully argued for a broader, environmentally-inclusive definition of security (such as Lester Brown, Jessica Mathews, Norman Myers, and Michael Renner) themselves came from the environmental community. Even if they were not offering forceful critiques of the global economic system or injustice in current development patterns, these advocates for the "greening" of security had ambitions to address the broad underlying causes of environmental degradation. When Barnett highlights throughout his book the dangers of the "securitization" of environmental issues, he is also pointing up this original division. Linking environment and security is a calculated risk reflecting a fundamental tension. In attempting to green security, how does one avoid the coercive, conflictual mindset associated with security thinking?

The results thus far have been mixed; but definitions and policies in both the security and environmental arenas continue to evolve. Indeed, one can make cases for either optimism or pessimism about incorporating environmental linkages into a more human-centered conception of security. For Barnett, the dangers of this evolution are best anticipated and addressed by "foster[ing] dialogue between a more diverse range of interests represented in reformulated governance processes" (page 10). He singles out the enunciation of human security and its explicit questions of "whose security" in the United Nations Development Programme's 1994 *Human Development Report* as a liberating step away from the exclusive state focus. His final two chapters place this human focus and the promotion of peace at the center of a fundamental attempt to reformulate environmental security.

The Future of Environmental Security as Policy

Debates on the merits of environmental security concepts (while less visible than highly-publicized policy fights) do remain very active within the bureaucratic guts of many governments. The change in U.S. presidential administrations has made the level of environmental security institutionalization in the United States presently uncertain. Numerous environmental security efforts of the past decade within the United States can be tied directly to Al Gore, and many wonder whether the environmental security initiatives adopted under the two Clinton administrations will die on the vine without Gore's high office driving intelligence community and defense community actions.

Early indications suggest that the U.S. Department of Defense will narrow its focus with regards to environmental security, focusing again on defense installation compliance with domestic environmental regulations. Environmental intelligence analysis—which got a large push during the latter half of the first Bush administration in the early 1990s—appears to be continuing, as policy consumers in the new Bush administration call for reports on environmental and associated transnational issues. And in what may be an interesting irony, the increased priority given to conflict prevention within the U.S. Agency for International Development may lead to more human-centered tools being applied within an environmental security sphere. While this potential shift from security institutions to development institutions as the primary (and legitimized) purveyors of environmental security would not fundamentally address the larger equity concerns expressed in *The Meaning of Environmental Security*, Barnett might welcome it as a first step to making human well-being a central concern. **W**

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Reflections on Water: New Approaches to Transboundary Conflicts and Cooperation

Helen Ingram and Joachim Blatter (Editors)
Cambridge: The MIT Press, 2001. 358 pages.

Reviewed by **Marcia Fraser Macomber**

Reflections on Water argues that the exploration of transboundary water issues must include social science methodologies to complement the more traditional approaches offered by law, engineering, and economics. The main point of the book is to stress that

water is never an objective, rational entity; rather, it is a social construct whose governance is determined by culture. While the case studies presented here deal with familiar water policy issues, they approach these issues in novel and valuable ways.

Reflections on Water details the development of current water policy, tracing it to modern societal belief systems that emphasized utility and individualism. The book argues that these notional legacies have led to an overemphasis in transboundary water policy research on legal, technical, and economic approaches. The authors maintain that, while traditional approaches continue to be necessary and useful, relying on these approaches may prevent a full understanding of water by obscuring how it can be valued within its social and ecological contexts.

The book's first two chapters lay out its theoretical framework, detailing a number of transformative processes that have reshaped the meanings of water and continue to do so. Through an exploration of globalization and decentralization, the authors describe how modern definitions of water have expanded in tandem with the development of Western civilization. They outline how this expansion and transformation has resulted in the emergence of a multitude of water-based epistemological communities, alternative governance structures, and political actors (including Internet-based communication networks, binational environmental alliances, and municipal-level regional water quality monitoring programs). While they acknowledge that some issues in transboundary water policy study require traditional perspectives, the authors of *Reflections on Water* stress that scholars who focus on national governments may miss observing the agency of other social actors.

The second section of the book explores these ideas through the use of eight case studies. Drawing on examples from Western and Eastern Europe, North America, and Africa, the case studies are authored by scholars from the fields of political science, environmental policy, social ecology, and law. The collection of topics reflects the editors' wish that the reader think "outside the box" about water. Studies are framed around transboundary issues for which water either may be represented physically or may simply provide a conceptual framework (thus deviating from more typical discussions of supply and demand, water markets, or allocation

issues). The authors utilize qualitative social science techniques—including network analysis, discourse analysis, historical analysis, and social ecology methods—to draw out the links between water, society, and transboundary resource stewardship. In each case study, the reader is drawn into observing the roles that are and are not played by both traditional and non-traditional actors.

Case studies framed in a social-ecology orientation provide examples of the cultural imbeddedness of the meaning of water as it relates to governance and policy. María Rosa García-Acevedo provides an example from the Imperial and Mexicali Valleys with a historical analysis of the relationship between water, land, and socio-institutional development along the U.S.-Mexico border. David McDermott Hughes juggles similar variables by looking at land allocation within Zimbabwe—where water represents both a physical and cultural border between Chimanimani National Park, the Vhimba people, and the national governments of Rhodesia and Zimbabwe. Both of these studies do an excellent job of sketching how indigenous people must confront and adjust to those policies developed in periods following non-indigenous settlement and the immigration of modern value systems.

Two other studies in *Reflections on Water* exemplify issues with a traditional "resource" orientation. Instead of being the policy issue itself, water in both these cases provides the medium for conflict or cooperation. These case studies also provide a more thorough understanding of how to use alternative social science approaches to disentangle societal drivers from decisions made by national resource institutions based on "objective and rational" mandates. In the first study, Kathleen M. Sullivan looks at the role of public media discourse in wild North American Pacific salmon "wars." Next, Paula Garb and John M. Whiteley provide an analysis of the institutional resiliency responsible for the maintenance of hydroelectric power production during political conflict in the former Soviet state of Georgia.

Still other case studies in the book reveal new linkages and associations for water by focusing on how it can provide the framework for transboundary environmental cooperation. Joachim Blatter and Suzanne Lorton Levesque use network analysis to describe how epistemic communities (a) form in response to shared environmental values, and (b) cause social actors to shift
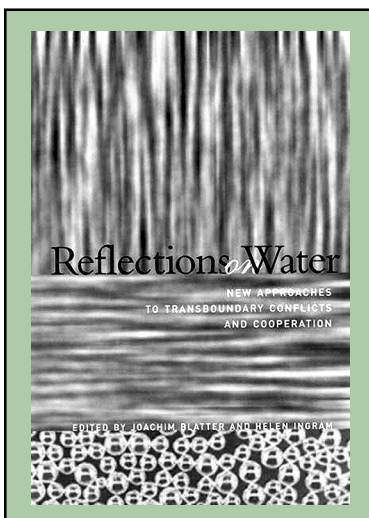
their allegiances from members of a nation to members of a transboundary community. The regulation of recreational boats on Lake Constance (bordered by Austria, Germany, and Switzerland) is the subject of Blatter's study. He first describes the development of various regional advocacy groups that support and oppose boat regulation, and then moves to show how these groups contributed to the formulation of pollution and habitat protection policies for the lake. Suzanne Lorton Levesque uncovers the Internet as a powerful actor in the construction of environmental advocacy networks both within and across the United States and

in many cases of international environmental institution building, legal initiatives between central governments of participating countries are a necessary precursor to building networks that can be supplemented by other political actors. As an example, he describes the role of the international community in forging collaboration between nations bordering the Black Sea via the establishment of the Black Sea Environmental Program (BSEP). DiMento's study provides a sobering view of the extreme difficulty important environmental programs face when they are not driven by local social actors. While he argues the BSEP is vital to the future of the region, he

The collection of topics reflects the editors' wish that the reader think "outside the box" about water.

Canada. For example, these networks have produced a transnational initiative to create a wilderness area extending from Yellowstone Park in Wyoming to the Yukon Territory in Canada.

Pamela M. Doughman and Joseph F. DiMento look at institutions set up by more traditional political actors, providing a comparison to Blatter and Levesque's grass-roots orientation. Doughman's analysis of U.S.-Mexico binational environmental institutions and DiMento's description of international conventions and organizations to protect the Black Sea both provide clear examples how institutional cultures frame definitions of water—definitions which ultimately drive the creation of water management policies.

Doughman compares the mandate of the first U.S.-Mexico binational water institution—the International Boundary and Water Commission (IBWC), created in 1944—with that of the institutions created as a party to the North American Free Trade Agreement (NAFTA) in 1993. Her analysis illustrates the effect of the transformative processes outlined in the earlier theoretical section of *Reflections on Water*. She describes how globalization and decentralization processes have shifted the focus of water policy—in this case, from the IBWC's concern with allocation and provision of water for agriculture to the current orientation of such groups as the Border Environment Cooperation Commission and the North American Development Bank toward qualitative aspects of water that provide for healthy communities and ecosystems. Doughman contrasts the IBWC (a closed organization run by engineers) with the democratic flavor of the NAFTA institutions, which seek to include participation of local actors.

DiMento's approach departs from the non-conventional orientation of the editors by arguing that,

details the barriers to its implementation, including "exclusionary ideologies which associate cooperation with the diminution or destruction of national values or religious beliefs" as well as lack of access to local perspectives on the part of the international organizations (page 250). Notions of governance that exclude societal considerations also tend to limit the number of possibilities with which international organizations have to work. Although DiMento's purpose is to argue for the importance of legal instruments, his analysis effectively demonstrates that laws are not enough.

The last section of *Reflections on Water* summarizes aspects of the case studies, stressing key points that correspond to the theoretical underpinnings laid out in the first two chapters. Authors Richard Perry, Joachim Blatter, and Helen Ingram draw the essays together by using water as an example and a metaphor for thinking about how globalization has changed the way the postmodern world thinks about governance.

The methodologies advocated in the book would be extremely useful in elucidating differences between Northern and Southern as well as Eastern and Western attitudes about water and governance. In all but one of the examples provided in *Reflections on Water*, the transboundary issues described were confined within the European/North American context. In both Blatter's and Levesque's studies, for instance, transboundary epistemic communities were created in regions where globalization processes have (a) diminished the importance of national borders, (b) reduced social inequities, and (c) enhanced access to communication for their citizens. Additionally, the countries to which these common value members belonged share a common language. This aspect of the European and North American networks compels one to wonder what type of networks exist where water is

shared between countries struggling with economic, political, and cultural systems that are obstacles to transboundary communication. Using discourse analysis to study the way in which actors in non-Western countries perceive and advocate water (or other environmental) policy issues and options could create new avenues for transboundary communication; it would also legitimize alternate perspectives describing how relationships between culture, society, and water have evolved. The case studies provide a colorful variety of diverse models that should stimulate ideas for social science water policy research in other geographical and cultural settings.

Reflections on Water combines many ideas into one book, which contributes to both its strengths and its weaknesses. Because the book's approach comes out of ideas from social theory, some may find its language unfamiliar and difficult to follow. Ingram and Blatter state that their goal is to "stimulate scholars in the international water policy community to think about inadequacies of existing approaches to international water policy and to complement those modern approaches with alternates [sic]" (page 4). But the weakness of the book is that the writing style and language may pose some obstacles to enticing those international water policy scholars who might benefit most from its contents. The language is also value-laden at times—for example, referring to conventional approaches as framing water in an "uninteresting fashion" (page 3) through the fault of "excessively rational and utilitarian mindsets" (page xv). Although the authors clearly acknowledge the value of these other interpretive frameworks, they run the risk of alienating those they wish to convert by employing such harsh terms.

Overall, however, *Reflections in Water* is an excellent collection of articles and is worth a thorough read. The book provides a unique blend of history, sociology, philosophy, and water policy questions. Its appreciation of new scholarly approaches provides a wide range of examples and ultimately succeeds in providing an interesting, refreshing, and extremely relevant contribution to thinking about water and governance. By focusing on social aspects, the book is able to analyze the effectiveness of organizational structures and cooperative mechanisms as they relate to the societies they are designed to benefit.

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Embassy's Regional Environmental Hub in Amman, Jordan as well as in Tijuana, Mexico on a binational workshop entitled "The Future of the U.S. Mexico Border: Population, Development and Water." Ⓦ

Environment and National Security: The Case of South Asia
By Narottam Gaan
New Delhi: South Asian Publishers, 2000. 265 pages.

Reviewed by **Sunila S. Kale**

In the post-Cold War era, a growing debate has emerged between those international relations scholars who still adhere to state-centered paradigms of security and those who believe that the proper unit of analysis should instead be the individual citizens of states. Narottam Gaan's monograph contributes to the literature of this latter group by applying a redefined notion of national security that includes environmental issues to the region of South Asia. While scholars wedded to traditional state-centered notions of security argue that stretching the definition of security to accommodate human and environmental concerns will ultimately decrease its heuristic utility, Gaan and others question the ability of the dominant state-centered models of international relations to adequately capture the range of threats to security in the contemporary era. According to this cohort, while the source of conflicts may be found in traditional threats to state sovereignty, these conflicts may have their genesis in phenomena not traditionally investigated in realist security paradigms. Environmental degradation and population migration are increasingly cited as examples of the "new" threats to security.

The environmental security literature is premised on the understanding that the boundaries of ecosystems, (defined as regions composed of living and non-living materials that interact to form a coherent life-system), do not conform to the political boundaries of sovereign states. Therefore, multiple ecosystems can share a single nation or—in, a far more dangerously situation in terms of interstate conflict—multiple states can share a single ecosystem. The most dramatic and often contentious example of the latter is the sharing of river systems by multiple states.

In a framework in which notions of security center on the individual, the sanctity of the environment also gains in importance. While realist accounts maintain that military capability is integral to maintaining security,

environmental security theories hold that access to water, productive land, and breathable air are equally important factors. In this vein, Gaan argues that environmental degradation forms a far more immediate threat to the individuals of states than do the threats of military aggression and interstate conflict.

Armed with these theoretical tools, Gaan provides an account of the sites of present and potential conflict due to environmental degradation among and within six states of South Asia: Bangladesh, Bhutan, India, Pakistan, Nepal, and Sri Lanka. The book is organized into an initial theoretical chapter followed by one chapter each on environmental degradation, the adverse social effects that result from it, and ensuing environmental conflict. A concluding chapter summarizes and re-articulates his principal theses. Each of the substantive chapters is further divided into descriptive sections on each of the countries included in the study as well as on specific inter- and intrastate conflicts.

In the first chapter, Gaan surveys the theoretical literature that challenges traditional notions of security and then outlines a theory of the causal mechanisms by which environmental degradation leads to conflic, (both within and between states). Gaan spends the subsequent three chapters presenting empirical evidence to substantiate his theory. Environmental degradation—which includes damage to land, water, atmosphere, forests, and the biodiversity of oceans and seas—is accompanied by a number of adverse social effects. Among the specific social effects Gaan discusses are: (a) economic decline resulting from decreased agricultural and industrial productivity; (b) lack of potable water; (c) scarcity of energy supplies; (d) health emergencies triggered by changes to the environment; (e) displacement of populations and the resultant ethnic and socioeconomic conflict; and, ultimately, (f) financial crisis and declining state capacity to find adequate solutions to conflicts. After discussing the social effects of environmental degradation, Gaan sketches the ongoing inter- and intrastate contestations in South Asia. These include (a) conflicts over water scarcity, (b) river siltation and erosion, (c) sharing of river systems, and (d) population displacement.

Authors of empirical studies face a trade-off between presenting a broad swath of information on the one hand and providing an in-depth analysis on the other. While replete with useful data, Gaan's presentation in the substantive chapters (2-5) lacks an organization that would more concisely synthesizes the data in an overarching theoretical framework. The theoretical section in chapter one outlines stimulating propositions about the association of environmental degradation and political conflict. But the evidence, while impressive in its scope, is never satisfactorily organized in the service of his thesis.

Gaan's book is impressive for the detailed information it provides, but it might have benefited from a narrower focus on a few specific sites of conflict. For example, in the chapters on environmental degradation and its social effects, Gaan provides substantial data on the status of the environment in Bangladesh. The Bangladeshi population is faced with a relative scarcity of land and decreased agricultural productivity, which is partially a result of increased siltation of the rivers and subsequent flooding (which deteriorates soil quality). In one section of the second chapter, Gaan notes that the affected populations often migrate in search of new economic opportunities. There is considerable migration from Bangladesh to various states of India, as well as migration within Bangladesh of peoples from the flood plains to the hill tracts. At the same time, the Bangladeshi government is increasingly unable to provide alternative solutions. Then, in his final substantive chapter on environmental conflict, Gaan details the conflicts that have resulted between the states of Bangladesh and India as well as among ethnic groups within Bangladesh. Gaan's text contains all of the relevant material to make a coherent argument linking environmental degradation and conflict. However, Gaan does not systematically guide his reader through this information.

Parsing out the theoretical and substantive import of Gaan's work would also have been made easier by clearer prose. The reader faces the obstacles of misused and misspelled words, awkward syntax, and grammatical errors. Despite these substantive and stylistic shortcomings, Gaan's book represents an important step in providing empirical support for a broadened theory of international relations and security. *Environment and National Security* will prove useful as a source of ideas for researchers who wish to explore sites of environmental conflict in South Asia.

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Ecology of War and Peace: Counting Costs of Conflict

By Tom H. Hastings
Lanham, MD: University Press of America, 2000. 142 pages.

Reviewed by **Elizabeth L. Chalecki**

"Si pacem para pacem" ("If you want peace, prepare for peace"). With this sentiment, Tom Hastings opens the door to a discussion of the interrelationship between violent conflict and environmental damage. Hastings, who is coordinator of the Peace, Conflict and Global Studies Program at Northland College, makes his "bias" clear on the first full page: he is a proponent of nonviolence, and advocates the abolition of all war and war preparation.[1] This is a noble opinion, but it necessarily limits the resulting discussion of possible security issues, since he believes that any kind of military force is useless at best and dangerous at worst. In addition, while he acknowledges in passing the existence of similar problems in other countries, his focus is entirely on the misdeeds of the United States. *Ecology of War and Peace* is not for the scholar; rather, it appeals to lay persons or undergraduates just beginning to study this subject and who might not have thought of these connections.

The book's first section, entitled "Ecological Costs of War Readiness," introduces the reader to the ecological damage resulting from development and testing of nuclear, chemical, and electromagnetic weapons. Hastings' main premise is that by poisoning ourselves with weapons production and disposal, we are the cause of our own insecurity. In addressing these issues, he (a) questions the military logic that writes off the people and wildlife in and around Paducah, Kentucky as "acceptable losses" in pursuit of U.S. nuclear power; and (b) points out that testing, deployment, and disposal of nuclear and chemical weapons largely occurs on native-held lands over the protests of indigenous people. The second section, "Shooting Wars: Mother Earth as Collateral Damage," discusses (a) the ecological damage caused by the use of Agent Orange in Vietnam, (b) the 1998-1999 air campaign in Serbia, and (c) some of the environmental effects of refugee populations generated by war. The third section, entitled "Ecological Causes of Conflict," deals with conflicts over water, the role of free trade in exacerbating unsustainable resource extraction and use, and the poverty that underlies conflict. In these two sections, Hastings relies heavily on anecdotal evidence, and repeatedly states that "stories of... harmful environmental activities are commonplace." A bit more elaboration surrounding such statements would have been very useful. The book's fourth section, entitled "Ecology of Peace," examines nonviolence as a solution to conflict, largely leaving the environmental question aside. Here, Hastings points out that the necessary conditions for war include humans' willingness to kill each other under certain circumstances and access to sufficient weaponry to do so. He concludes that a nonviolent conflict- management system would allow humans to value all life on earth, not just their own.

Many features of this book are worthy of praise. Hastings' concern for humankind and passion for environmental and social justice are unquestionable. He recounts with sympathy the stories of pilot Herb O'Brien, who contracted throat cancer after disarming a nuclear weapon in a radiation suit that failed to cover his neck, and soldier Tim Gilmore, who developed inoperable tumors after exposure to Agent Orange. He also brings up interesting questions that most scholars in this field would not relate to security questions—such as the difference between "hard" ethics (based upon scientific evidence) and "soft" ethics (based upon "charismatic and emotional appeal").

Unfortunately, those looking for a systematic and academically rigorous examination of the ecological costs of war will have to look elsewhere. There are very few references to sources, a lack of documentation that is especially frustrating to those who would like to know more about any particular point or incident. Instead, the author makes general statements, such as "the scientific community concluded time and time again..." (page 41) without providing any supporting evidence. Occasionally he will cite something, only for the reader to find that it is from the Grandmothers For Peace Newsletter or other such gray sources. Referencing a more comprehensive list of peer-reviewed literature in this field would have been extremely helpful.

Hastings also touches briefly and without substance on issues with major environmental security impacts, such as global warming, the World Trade Organization, the relationship of terrorism to national security, and the role of non-governmental organizations and coalitions in changing the defense agenda to include environmental
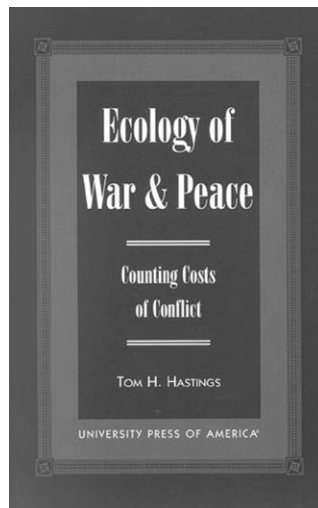
issues. Finally, a few jarring phrases (such as referring to the Vietnamese as "illiterate and nearly Stone Age peasants") mar the otherwise hopeful tone of the book. Given the criticisms above, *Ecology of War and Peace* should be considered a call to activism for those who want to incorporate personal moral beliefs into their environmental security studies. **W**

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ENDNOTES

[1] Hastings is clearly inspired by Christian anarchist Ammon Hennacy, who used nonviolent, faith-based activism to protest development and testing of the atomic bomb.

Environmental Security and Engagement in Central Command

By Colonel Alan L. Moloff
Atlanta: Army Environmental Policy Institute, 2000. 35 pages.

Reviewed by **Kelley Sayre**

*E*nvironmental Security and Engagement in Central Command by Colonel Alan L. Moloff, MC, is a summary of (a) the environmental security issues in the U.S. Central Command (CENTCOM) Area of Responsibility and (b) the possible steps that could be taken to integrate environmental security initiatives into peace-time engagement missions. Colonel Moloff argues that, in order to justify military participation in environmental security missions, any exercises undertaken would have to be not only cost-effective but also serve U.S. interests—particularly by increasing regional stability and reducing the likelihood of conflict.

CENTCOM covers the Arabian Peninsula and Iraq, the northern Red Sea, the Horn of Africa, and South and Central Asia. Moloff identifies four environmental problems that are common throughout the area: (1) increasing consumption and waste fuelled by population growth, (2) scarcity of potable water, (3) contamination from hazardous and industrial wastes, and (4) the predisposition to infectious disease. The book offers specific and detailed engagement exercises to combat these problems.

Moloff argues that, since the U.S. Department of Defense (DOD) already conducts peace-time humanitarian relief missions, peace-time environmental security missions could lessen the probability of conflict arising from environmental problems. Since the Department of State and U.S. Agency for International Development (USAID) already serve such engagement missions throughout the globe, Moloff suggests that the DOD collaborate with State and USAID. To kickoff this effort, Moloff envisions an annual conference headed by State that would provide (a) ideas for environmental security engagement missions, (b) intelligence about potential missions, and (c) a forum for nongovernmental organizations to share their ideas and past experiences. He also suggests educating senior officers about the issues at hand so they will be more likely to participate. In the end, Moloff notes, any missions undertaken by DOD must be economically beneficial, and provide other benefits to the United States as well as the host country.

Environmental Security and Engagement in Central Command is a brief description of the issues at hand and possible solutions for environmental security problems in CENTCOM. It is also an outline for a plan of action in the future. In addition, the monograph concisely illustrates how the national security strategy addresses the issue of environmental security. While short in length, it is a well-rounded look at the DOD's perception of environmental security and conflict prevention. **W**

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The Caspian Sea: A Quest for Environmental Security

William Ascher and Natalia Mirovitskaya (Editors)
NATO Science Series 2: Environment and Security,
Volume 67. Dordrecht, Netherlands: Kluwer Academic
Publishers, 2000. 364 pages.

Reviewed by **Stacy VanDeveer**

The profound political and economic changes across the Caspian Basin (as well as its reportedly large oil reserves), have raised interest in Caspian politics around the world. In *The Caspian Sea: A Quest for Environmental Security*, William Ascher and Natalia Mirovitskaya have tapped this increased interest and assembled a book that adds to our understanding of political and economic development within Caspian states and the unique nexus of environmental security issues in the region. (The volume resulted from a 1999 Advanced Research Workshop, involving participants from sixteen countries with experience in NGOs, governments, academia, and the private sector.) The book is a tour de force of the international and transnational politics around the Caspian Basin.

Ascher and Mirovitskaya seek to understand "how to foster cooperation in resource-sharing and environmental security issues and how to structure international cooperation to ensure its effectiveness" (page ix). *The Caspian Sea* includes 24 chapters that are, organized into five sections ("Development versus Environment?"; "Caspian Geopolitics"; "Law and Development"; "The Role of Civil Society and Scientific Institutions"; and "Prospects for Effective International Cooperation"). The editors' introduction and conclusion are extremely useful and informative, effectively connecting and drawing lessons from all of the book's other chapters. And *The Caspian Sea's* many authors collectively demonstrate the importance of linkages across the large issue areas of environmental challenges, security and geo-strategic politics, law and legal systems, and civil society development. If the linkages between these issue areas remain ignored or unaddressed, these authors suggest, prospects for effective regional cooperation around environmental and traditional security concerns may remain grim. Particularly convincing are their arguments that the region's environmental and economic development questions cannot be effectively addressed at regional or domestic levels without serious attention to legal reform and civil society development and participation.

The Caspian Basin is understood to contain significant oil reserves. Yet valuable resources such as oil are no guarantee of democracy or long-term economic development. For states with oil reserves, the often violent and exploitative resource politics of Nigeria offers a cautionary tale. For citizens, the frequent lack of democracy and human rights in many oil rich states is also worrisome. Ascher, Mirovitskaya, and their colleagues outline a host of connections between Caspian oil and gas development and its related environmental and security challenges—including marine and air pollution, biodiversity loss and the reduction in fish stocks, desertification, geological instability, and sea level variance.

For those who find many of the books in the NATO Science Series heavy on scientific, technical, and environmental assessment and short on politics, *The Caspian Sea's* concentration on multidisciplinary political, legal, and social analysis is a welcome rejoinder. Furthermore, the book brings a main strength of the NATO series: numerous contributions from Caspian researchers and feedback for all authors from a diverse set of experts from inside and outside of the region who participated in the 1999 workshop.

Ascher and Mirovitskaya's *The Caspian Sea* is a
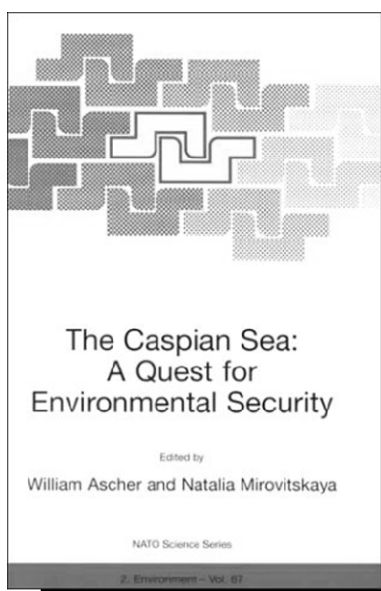
comprehensive and much needed addition to the literature on regional environment and security linkages. It is of interest to all those concerned about the proliferating regional environmental challenges around the globe and to those focused on regional security concerns. The book highlights the important, but often subtle, connection between traditional security concerns and the burgeoning ecological and resource-related challenges to human well-being. **W**

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Altered States: Globalization, Sovereignty, and Governance

By Gordon Smith and Moisés Naím
Ottawa: International Development Research Centre, 2000. 78 pages.

Reviewed by **Anita Sharma**

Protests during last year's World Bank, International Monetary Fund (IMF) and World Trade Organization (WTO) meetings surprised and shocked many leaders of these multinational institutions. Since the organizations view their missions as assisting development and address poverty in mainly Southern countries, why were they castigated for encouraging globalization and trade liberalization?

Responding to the protests of more than 20,000 people in Prague that shut down World Bank/.IMF meetings, World Bank President James Wolfenson showed his dismay. "We are trying to do a job that makes things better," he said. "Outside these walls, young people are demonstrating against globalization. I believe deeply that many of them are asking legitimate questions. And I embrace the commitment of a new generation to fight poverty. I share their passion and their questions. Yes, we all have a lot to learn, but I believe we can move forward only if we deal with each other constructively and with mutual respect" (McCarthy, 2000).

But as Gordon Smith and Moisés Naím correctly note in their new book *Altered States: Globalization, Sovereignty, and Governance*, the more nefarious effects of globalization threaten to obscure and obviate the positive connections that global integration and interdependence bring. According to Smith and Naím, when commercial interests exploit trade opportunities in search of cheap labor and investment, the resulting inequalities of "wealth, consumption and power" are exacerbated at astronomical levels. While many individuals

have profited from the effects of globalization, increasing despair and alienation are more commonplace. As detailed in *Altered States*, the gap between rich and poor countries has widened so that the fifth of the world's population living in the richest countries now has 74 times the income of the fifth living in the poorest ones. (In 1960, that ratio was 30 to 1 in 1990, it was 60 to 1.) OECD (Organisation for Economic Co-operation and Development) countries, which have just 19 percent of the world's population, account for 71 percent of world trade, 58 percent of foreign direct investment, and 91 percent of all Internet users (page 8).

Altered States, commissioned by the United Nations Foundation and its Better World Fund and published last year by Canada's International Development Research Centre, was intended to inform and influence the agenda of the UN Millennium Summit held in October of 2000. Based on the assertion that a stronger and reformed United Nations can improve global governance and create a more peaceful world, *Altered States* explores (a) the positive and negative forces of globalization, (b) the subsequent challenges and opportunities for state sovereignty, and (c) the current governance gap. Smith (director of the Center for Global Studies at the University of Victoria, British Columbia), and Naím (editor of *Foreign Policy* magazine and former Venezeulan Minister of Trade and Industry) focus on three imperatives in need of immediate attention: (1) preventing deadly conflict, (2) providing opportunities for the young, and (3) managing climate change. They also suggest ways in which the United Nations and its member states can work together to tackle these challenges.

Gordon and Naím's central assertion is hardly a new concept: that globalization has the capacity to simultaneously erode the sovereignty of states while ascribing new legitimacy through international regimes. Governments have moved from dominant player to simple market participant in key areas historically conceded to their competence (control of lethal force, capital, and information). The global diffusion of lethality means that, in some countries of the world, private armies can outgun the organized militaries, and that in many places private hands control greater sums of capital than do governments. Moreover, with the marked increase in social mobility worldwide and the explosion of the Internet, people are ever more self-reliant in validating the information they receive.

Over the past fifty years, governments have increasingly looked to each other for help in solving complex transnational issues and in establishing rule-based regimes. Their efforts might be grouped into three broad categories: (1) global housekeeping; (2) global safety; and, in an altogether different kind of problem, (3) the management of expanding individual rights. *Global housekeeping* involves such issues as

the environment, energy resources, and international economic activity. *Global safety* includes efforts to devise effective arms control regimes and other arrangements for mutual security. *Managing the emergence of individual rights* can be seen in the development of the global human rights agenda, which has at its core the clear message that governments have obligations to their citizens and not simply to each other. Catastrophes such as Haiti, Somalia, Bosnia, Rwanda, Kosovo, and elsewhere since the end of the Cold War have generated growing claims that members of the international community have an affirmative obligation to act. And governments are increasingly being held accountable not only for their own actions but also for the actions they tolerate among fellow governments. According to Smith and Naím, this increasing incapacity of states to manage their own affairs (and their consequent reliance on international institutions to provide global public goods) means that the international community must harness the positive forces of globalization and commit toward strengthening global governance.
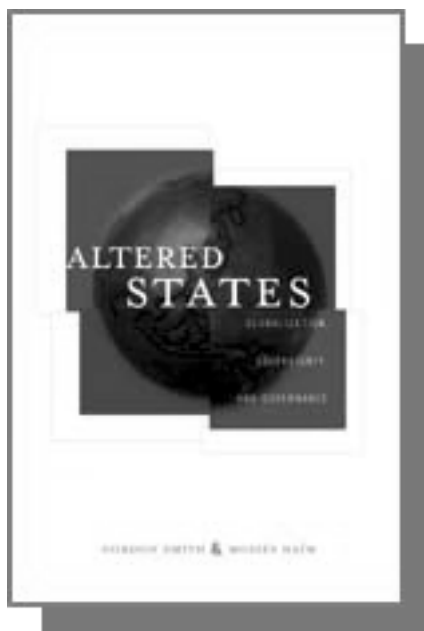
But the global community is not at all ready for such action, according to Smith and Naím. As they put it:

> What becomes more obvious, however, is the troubling mismatch between institutional capacities and customs of governance and the problems that need solving. We are simply not organized well to manage our affairs. This is why the dynamics of globalization inspire such dread and resistance, whether among Swiss farmers afraid for their livelihoods, or suddenly unemployed South Koreans, aboriginal peoples tenacious in defense of their cultures or worried Illinois teachers with pensions invested in rickety Asian securities. (page 3)

So how might the international community reconcile the dilemmas posed by the processes of globalization? *Altered States* suggests using the United Nations as a vehicle to counterbalance the inequities that accompany globalization. While it may be radical to assume that a stronger UN may be the panacea to all our ills, the authors contend that their suggestions are not revolutionary approaches toward global governance. As a matter of fact, most of their recommendations toward preventing deadly conflict,

providing opportunities for the young, and managing climate change incorporate mechanisms already within the United Nations system.

Regarding the prevention of deadly conflict, Smith and Naím draw attention to the fact that conflict is overwhelmingly intrastate. They argue that, as the international community develops norms and rules "that legitimize. . .international intervention to stop the worst offences against human security and human rights" (page 24), it must do so in a legitimate and effective manner. In the authors' opinion, illegitimate interventions (such as NATO's military campaign against Kosovo) or imprudent decisions by the Security Council (such as supporting the ill-timed independence referendum in East Timor which led to mass violence and rioting) threaten the legitimacy necessary to undertake such missions. For more effective UN conflict prevention measures, *Altered States* suggests measures that would strengthen early-warning capacities and enhance the UN Secretary General's ability to respond to incipient crises. (This rapid reaction response mechanism was more fully explored in the Report of the Panel on United Nations Peace Operations, also known as the Brahimi Report.[1]) As the authors suggest, however, early-warning signals and calls for early prevention often fall on deaf ears in the UN Security Council. While Smith and Naím do not advocate unlikely measures such as amendments to the UN Charter to curtail the veto or expand membership, they do suggest other reform measures that could be enacted to reform without amendments. These include: (a) developing tacit agreements among the Permanent Five to refrain from vetoing procedural resolutions; (b) vetoing only resolutions that threaten a country's own vital interests; and (c) mandating vetoes be accompanied by a public statement justifying the decision.

Global disparities of wealth (such as increasing poverty and squalid conditions in burgeoning megacities, escalating environmental degradation, and the resultant health crises) are the most severe threats to the futures of the world's children—one-sixth of the world's population. According to Smith and Naím, the cooperative-action capacities of the United Nations are also perfectly suited to better opportunities for youth by "enhancing their access to the necessities of life." These include addressing the HIV/AIDS scourge, providing basic education to every child, expanding

Internet access in developing countries, and bettering children's health—particularly by discouraging tobacco consumption and reducing exposure to leaded gasoline.

The good news is that the United Nations is already giving most of these issues high priority. Recently, UN Secretary-General Kofi Annan initiated a "global fund" (estimated to require between $7 billion to $10 billion a year) to help combat HIV/AIDS. The UN General Assembly is also holding high-level political meetings to intensify international action to fight the epidemic and to mobilize the resources needed. In addition, UNICEF has several programs encouraging opportunities for childhood education. But according to Smith and Naím, some goals are yet unrealized: they point to the unkept promises of the 1990 World Summit of Children to encourage the health of children. However, they also note that progress has been made in several areas. In particular, the WHO-sponsored Framework Convention on Tobacco Control (launched in 1999) is a notable effort to reduce cigarette smoking among children.

Environmental challenges such as global warming are at least in part human-generated phenomena, and Smith and Naím argue that any solution must not just address technical issues but also incorporate political and institutional solutions. However, given recent statements by the Bush administration, one solution offered by *Altered States* (reducing emissions that cause global warming by strengthening the Kyoto Protocol) will be unlikely. Others proposals by Gordon and Naím (such as accelerating the start-up of the Clean Development Mechanism, a governance mechanism in the Kyoto Protocol that channels financial resources to developing countries for investment in sustainable development) are only possible if individual states are dedicated to their implementations.

Kofi Annan's Millennium Report, "We the Peoples: The Role of the United Nations in the 21st Century," took up many of the same themes as *Altered States* (Secretary General, 2000). The report also focused on the awesome effects of globalization, and pledged that the UN would work toward the eradication of world poverty by increasing economic and technological opportunities throughout the world, generating opportunities for the young, and promoting health and combating HIV/AIDS. In addition, "We the Peoples"advocated the prevention of deadly conflict by: (a) encouraging balanced economic development with a commitment toward human and minority rights (b) strengthening peace operations (c) encouraging smarter sanctions and (d) addressing questions of intervention and sovereignty. Confronting challenges such as global climate change, the water crisis, soil depletion, and deforestation

requires an increased commitment toward global stewardship. As articulated in *Altered States*, the quality of life for future generations hinges on our ability to manage and protect our environment.

Just as globalization is a process, efforts to spread its benefits and mitigate its harmful effects must reflect a course of action that constantly cultivates better governance as well as the responsibility and resources necessary to encourage a better and more just world. While *Altered States* repeats the often-heard litany of globalization's positive and harmful effects, it goes a step beyond the usual rhetoric by offering useful suggestions to address these challenges. **W**

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ENDNOTES

[1] Released amid great fanfare and skepticism in the fall of 2000, the Brahimi report (named after its chair, former Algerian Foreign Minister Lakhdar Brahimi) offered recommendations to strengthen the world body's peacekeeping role—including the need for preventive initiatives, sound peace-building strategy, promotion of international human rights instruments, rapid deployment of forces, and on-call expertise. Its most important and most controversial recommendation was the suggestion that peacekeeping be treated as a core activity of the United Nations and that expanded operations and efforts be consolidated within a single branch directly under the UN Secretary General.

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Contagion and Conflict: Health as a Global Security Challenge

By Michael Moodie, William J. Taylor, Jr., Glenn Baek, Jonathan Ban, Charles Fogelgren, Scott Lloyd, John Swann and Yun Chung
Washington, DC: Center for Stragtegic and International Studies, 2000. 76 pages.

Reviewed by **Mark W. Zacher**

A great deal has been written about the impact of health issues on national and international countries' security over the past decade. "Security" in this context refers to the lives and medical conditions of a state's citizens—but it also connotes the overall strength of national economies and societies. Excerpts of a recent study on this topic was published in this journal in summer 2000—namely, the National Intelligence Council's (NIC) report *The Global Infectious Disease Threat and Its Implications for the United States*. The NIC report provides quite a good overview of data concerning the geographical pattern of diseases and some of their effects. *Contagion and Conflict* (which is produced by the Center for Security and International Studies and the Chemical and Biological Arms Control Institute) is comparable to the NIC study in both length and purpose.

The introduction of *Contagion and Conflict* reviews the worldwide pattern of infectious diseases and also outlines the three major issues concerning the interaction between health and security—failing states, humanitarian warfare, and biological warfare. Its discussion of the global pattern of diseases provides some relevant information, but it could have been more thorough in describing the prevalence of diseases in different areas and varied conditions and the use of biological warfare. Additional information would have been particularly useful for the subsequent section on failing states.

The monograph's first section treats the influence of health problems on failing states, identifying a number of impacts the authors claim are interrelated. These include: (a) economic destabilization because of a loss of productive workers; (b) a decline in the ability of governments to respond to a host of problems; (c) a sense of popular alienation from the government; (d) a decline in food production; (e) the increased risk of foreign intervention and interstate wars; and (f) the increased risk of conflict over the use of sanctions against states that violate UN resolutions (e.g., Iraq). These are all interesting points, but there is little corroboration in *Contagion and Conflict* of their interrelationships. For example, it would have been helpful if the authors had discussed some concrete examples of how national health problems have promoted and could promote foreign intervention and interstate wars. One could, in fact, make the case that in Africa the prevalence of serious health problems have discouraged military adventurism because disease-ridden countries are unable to mount military ventures.

The second section of *Contagion and Conflict* deals with health standards and humanitarian warfare. It focuses in particular on "the imposition of deprivation" by one combatant on another—especially in civil wars, and particularly involving the denial of food and medical supplies. The recent cases of Yugoslavia, Rwanda, Sudan, and Kosovo are noted. As the history of "scorched earth" policies indicates, this is not a new problem; in fact, it may have been worse in the past. The authors fail to explore either the particular ways in which this strategy is being employed or (in the light of the present concern about infectious diseases) how combatants might be promoting the spread of such diseases. In fact, instances of states' deliberately promoting the spread of infectious diseases during warfare are probably quite rare, whereas the manipulation of food supplies during conflict is very common.

The final problem addressed in *Contagion and Conflict* concerns biological warfare, which has attracted much more attention from high levels of government than the previous two topics (especially in the industrialized world, which sees itself as the most likely object of attacks). This section of the monograph reviews some of the major features of international policy regarding biological weapons as well as several key policy problems. Its main focus is on Western approaches to dual-use technology. The discussion is a perfectly good overview, but it does not point up any new approaches.

The last two sections of the monograph concern recommendations for broad and specific strategies on
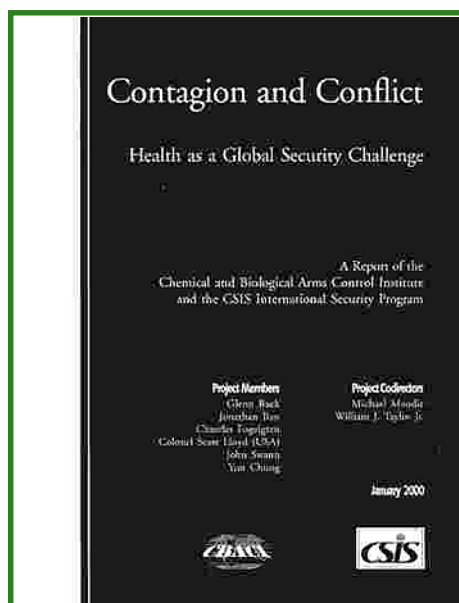
contagion and conflict. The central consideration is the need to balance a humanitarian desire to help and a prudential concern to avoid risks. Some of the more specific recommendations are (a) the building of better monitoring and information-sharing systems, (b) governmental support for the development of drugs that are needed in the developing world, (c) the restructuring of refugee camps, (d) the reappraisal of policies toward dual-use technologies in the case of biological weapons, and (e) the need to take a large number of considerations into account before intervening in foreign health emergencies. These are all perfectly good recommendations, but they are not accompanied by discussions of how to secure the necessary foreign and local political support.

For someone who does not know a great deal about the intersection of health and security concerns, this monograph provides an overview of a good of number of the constituent issues. However, it does not offer a great deal to people who have worked on these matters.

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The Security Dynamics of Demographic Factors

By Brian Nichiporuk
Santa Monica, CA: RAND, 2000. 52 pages.

Reviewed by **Jessica P. Powers**

In *The Security Dynamics of Demographic Factors*, Brian Nichiporuk looks at three key demographic trends and their impact on U.S. and global security for the future. Citing the growth of research on the role of population as a national security variable, Nichiporuk (writing for RAND's Population Matters program and the Arroyo Center, RAND's army research division) undertakes to condense the multifaceted and disciplinary research into a concise and readable format designed to appeal to policymakers. He does a fine job of analyzing the impact of demographic factors such as long-term fertility trends, urbanization, and migration on security.

Nichiporuk argues that the United States must (a) focus on military preparedness, (b) more carefully target foreign aid for development, and (c) pay more attention to indicators and warning measures in order to be able to respond more effectively to security challenges posed by demographic factors. He begins by defining the two fundamental areas of demography: population *composition* and population *dynamics*. While population *composition* describes the "characteristics of a given population," population *dynamics* addresses the "changes in composition of a given population over time" (page 3). Nichiporuk acknowledges that demographic factors alone rarely cause internal or external conflict. But he also points to their indirect role in exacerbating underlying tensions (such as ethnic tensions or resource scarcity), citing the work of different scholars including Peter Gleick, Jessica Tuchman Mathews, and Thomas F. Homer-Dixon.

Next, Nichiporuk details current global demographic trends. According to the latest middle-range estimates of the United Nations, today's world populationxd of more than six billion people is expected to rise to a high of 9.4 billion by 2050. Most of this growth (up to 95 percent, according to Nichiporuk) will occur in developing nations. The author is quick to point to the especially high fertility rates of nations such as the Democratic Republic of Congo (DROC) and Nigeria, large African nations that are replete with natural resources such as oil and diamonds but that suffer from conflict and unrest. Conflict in the DROC is not only interethnic but also has attracted the intervention of neighboring countries, which have their militaries deployed both in the country and along its borders. Sierra Leone and Liberia, examples of failed states in the developing world, are also experiencing high fertility rates of 6.1 and 6.3, respectively (page 42).

Another demographic trend noted in *The Security Dynamics of Demographic Factors* is the growing urbanization in the developing world. In 1950, only 17 percent of the world's population was urban, compared to over 50 percent of today's population. Within the developing world, urban areas are increasing far faster than in the developed countries. By 2015, there will be 23 "megacities" (or cities with populations of at least 10 million people), within the developing world—including Bombay, Lagos, Dhaka, Rio de Janeiro, and Teheran.

What are the security implications of these demographic trends? Nichiporuk identifies three. First, demographic trends can lead to changes in the nature of conflict. These changes will result from rapid growth in urban populations, changing migration patterns, and the impact of concentrated growth on resource availability. Second, changing demographics will drive states to develop different sources of national power. Many developing nations with high growth, for example, have

Report on the Future of the U.S.-Mexico Border: Population, Development, and Water

The current situation along the U.S.-Mexico border illustrates the effect that rapid population growth can have on efforts to achieve sustainable development. Current migration trends in this region, coupled with the natural rate of population increase as well as intensified trade, are putting intense pressures on the border's environment, water supply, and health and sanitation infrastructure. Policymakers and practitioners must consider the relationship between population and environmental dynamics in order to develop appropriate interventions.

In May 2001, the Environmental Change and Security Project (ECSP) and the University of Michigan Population Fellows Program (PFP) hosted a workshop in Tijuana, Mexico entitled "The Future of the U.S.-Mexico Border: Population, Development, and Water." The workshop provided a valuable forum for interdisciplinary and binational communication—a necessary prerequisite for progress toward a sustainable future for this important international setting. Participants discussed the opportunities and constraints facing border citizens and decision-makers over the next 25 years with regard to transboundary water, health, and demographic issues.

ECSP and PFP will publish in fall 2001 a summary of the workshop's proceedings, conclusions, and recommendations as well as two papers presented during the workshop. Contact Robert Lalasz at lalaszrl@wwic.si.edu or 202/691-4182 for more information.

created two sets of military populations: elite units to maintain order, and state power and infantry units to act as regular army forces. Finally, sources of conflict will change, impelled by factors such as the mounting unemployment of growing youth bases in developing countries whose fledgling economies are already struggling.

One factor largely omitted by Nichiporuk's analysis is the threat of infectious diseases. He does acknowledge the devastating impact of the HIV/AIDS epidemic on sub-Saharan Africa, even going so far as to recognize it as a wild card. However his later discussion on military power in developing nations fails to analyze how the devastation of this pandemic might affect developing nations' manpower resources. For example, while 16 of the 20 nations with the highest fertility rates globally are in sub-Saharan Africa, the majority of HIV/AIDS cases (roughly around 70 percent) are currently also in sub-Saharan Africa. In the case of African military populations (often pointed to as a vector for the disease given their frequent and often long deployments), general surveillance data are nearly nonexistent. This lack of data is due to a number of different factors, including: (a) the difficulty of obtaining numbers due to stigma, (b) fear of release from active duty after testing positive, and (c) governments' anxiety that acknowledging the impact of AIDS on their militaries could make them appear vulnerable to others.

Furthermore, it is widely acknowledged by epidemiologists that this deadly disease is spreading to India and China as well as across other parts of Asia—all areas that are experiencing phenomenal growth. And in countries showing negative or low population growth (such as Russia), the HIV/AIDS pandemic is also gaining ground. How these countries will be affected militarily by the loss of huge segments of their adult working population to infectious diseases is a topic that needs to be explored in greater depth.

Despite this omission, Nichiporuk's review of demographic factors and their implications for security addresses some of the most important challenges. Especially worthwhile is Nichiporuk's recommendation that the United States should be responding to such demographic pressures through both proactive policies and monitoring of warning signs, including:

- Emergence of a youth bulge combined with low job-creation rates/government indifference;
- Divergent fertility rates between neighboring states with land borders, no nuclear weapons, and comparable technological levels;
- Chronic high fertility rate in developing nations with one party rule and weak political and healthcare institutions;
- Divergent fertility rates between ethnic groups having mixed settlement patterns and historical

enmity;
• Steady regional declines in per-capita freshwater availability coupled with new development projects with cross-border implications (e.g., dams, irrigation systems).

Population pressures can exacerbate explosive situations, leading to major crises. As such, the United States should work to improve its monitoring systems. Given the brevity of Nichiporuk's report, he was unable to cover these inadequacies in more detail. Perhaps future studies by RAND will address them. **W**

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The Ingenuity Gap

By Thomas Homer-Dixon
New York and Toronto: Alfred A. Knopf, 2000. 480 pages.

Reviewed by **Marc A. Weiss**

Thomas Homer-Dixon's essential argument in *The Ingenuity Gap* is that ingenuity—a special blend of creativity and innovation—will help us all develop new solutions to the world's great challenges. His discussion of the earth's physical and human difficulties (from climate change to the growing gap between rising wealth and persistent poverty) clearly articulates the increasing need for "such ingenuity" to call forth viable solutions. At the same time, he recognizes the limitations on the ability and willingness of people to generate practical and visionary answers to very tough questions, with technological advances serving as both a help and a hindrance to this healing process.

Homer-Dixon focuses on what he identifies as "the ingenuity gap" that is placing humanity ever further behind the learning curve in the face of serious global concerns. "Rather than speaking of limits," he writes,

it is more accurate to say that some societies are locked in a race between a rising requirement for ingenuity and their capacity to supply it. . . .If a society develops a serious ingenuity gap—that is, if it loses

the race between requirement and supply—prosperity falls in the regions already affected by scarcity. . .Such societies risk entering a downward and self-reinforcing spiral of crisis and decay (pages 374-5).

This interesting approach leads Homer-Dixon to relatively pessimistic conclusions, or at least ones that must inevitably draw their hopefulness from faith rather than science:

As ingenuity gaps widen the gulfs of wealth and power among us, we need imagination, metaphor and empathy more than ever, to help us remember each other's essential humanity. I believe this will be the central challenge of the coming century—one that will shape everything else about who we are and what we become (pages 395-6).

The Ingenuity Gap does provide the reader with a very interesting and well-written discussion of complexity theory, chaos theory, new growth theory, and a host of other recent ideas in economics, sociology, environmental science, information technology, and philosophy. Indeed, Homer-Dixon takes us on a veritable cook's tour of his inquiring mind and an intellectual journey in space and time—ranging from Canary Wharf in London to Patna, India, and encompassing personal conversations with scholars such as geologist Wallace Broecker and marine biologist Michael Whitfield. This journey-of-discovery style of narrative permeates the text. "I had come to Las Vegas on the penultimate leg of my travels," Homer-Dixon writes at one point. "I now had at hand most of the pieces of my ingenuity puzzle. . . .These somewhat disconnected thoughts ambled through my mind as I ambled around Comdex, reinforcing similar conclusions I had reached earlier in my investigations. . ." (pages 314 and 319).

But while *The Ingenuity Gap* is certainly literate and engaging, it generally fails to answer the vital question the publishers pose on the front of the dust jacket above the title: "How can we solve the problems of the future?" Homer-Dixon's efforts ultimately do not add much of value to what we already know about international economic, social, and environmental issues. For example, he suggests that we need to accelerate the supply of ingenuity:

Whether it's a matter of meeting our energy demand by inventing new types of fuel, feeding a still rapidly

growing world population by boosting grain yields, stabilizing the international financial system by making available more information of countries' finances, or stopping mass violence by setting up an international rapid-reaction force, we need to supply more and better ingenuity for more and better technologies and institutions (page 397).

But how should we accomplish these goals? Homer-Dixon's answer, unfortunately, is not especially original or innovative:

This means that we should dramatically increase our funding for scientific research in critical areas—like energy and agriculture—in the hope we can invent new technologies. And it also means that we should reform existing international institutions (from the IMF to the UN) and build a range of new institutions (for example, to deal with climate change) to ensure global prosperity and peace. While a formal world government is probably not in the cards, at least not for a long time, we must accept that our *governance* of our global affairs has to become vastly more elaborate and sophisticated (pages 397-8).

In addition to arguing that humanity needs to increase the worldwide supply of ingenuity, Homer-Dixon also suggests that human beings collectively can "slow our skyrocketing need for ingenuity" by easing up a bit on the rapid pace of change—mainly through reducing population growth, resource utilization, and the globalization of finance capital. If only people would stop hurrying to promote the ethic of "more and better," contends Homer-Dixon, we could all relax and not worry so much about the necessity for constantly producing new forms of ingenuity. Indeed, he argues that "[a] shift to less material values in rich societies would help reduce our overall need for ingenuity to manage our relationship with our environment"(pages 398-9).

But while increased scientific research, conservation, and consumption reduction are certainly worthwhile goals, they hardly constitute pathbreaking new ideas or a highly creative policy agenda. In *The Ingenuity Gap*, one of the most important gaps is contained within the book itself. Convincing people to create a world government and cease purchasing large homes or cars will require far

more ingenuity than Homer-Dixon offers us here. He identifies serious problems and proposes thoughtful solutions. Yet nowhere in his long discourse does he really explain where or how "ingenuity" will generate the answers. **W**

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The Pervasive Role of Science, Technology, and Health in Foreign Policy: Imperatives for the Department of State

Washington, DC: National Research Council, 1999.
111 pages.

Reviewed by **Clair Twigg**

In the last twenty years, science, technology, and global health (STH) have become central topics in discussions of national and international security. In 1998, the U.S. Department of State (DOS) asked the National Research Council to examine the role of STH in foreign policy issues and to suggest ways in which DOS both could improve its ability to react to STH problems and better use the STH expertise for which the United States' scientific community is known. The result of that study, *The Pervasive Role of Science, Technology, and Health in Foreign Policy: Imperatives for the Department of State,* offers recommendations that focus on (a) providing leadership within the DOS on STH-related issues, and (b) strengthening the available base of STH expertise available to DOS.

Science, technology, and health issues are central to many DOS interactions with other governments. Issues such as nuclear nonproliferation, infectious disease, the use of energy resources, population growth, and food supply are just some of the many issues on which DOS must be current and proactive. In recent years, however, the importance placed on STH within DOS has decreased. There is no longer an STH-related cone in the Foreign

Service; there is no incentive for either civil or foreign servants to gain STH training; and the number of science counselors in foreign embassies has been reduced to only 10 worldwide. STH issues are not seen as important within the Foreign Service culture, and many employees have no desire to take on new topics and undergo further training.

As *The Pervasive Role* puts it, in many instances STH issues have been viewed within DOS as "minor appendages to foreign policy discussions, and many international STH programs are handled as a special category of activities only vaguely related to the

related activities are of major interest to the U.S. Government and to missions to international and regional organizations that support STH programs of considerable foreign policy significance" (pages 57-58). DOS should also (a) offer its employees both the training and the compensation to taking on additional skills, and (b) lobby Congress for additional funds as they are needed for this training and restructuring. The report argues that, by having better-trained employees with a higher sensitivity to STH issues, DOS can assist not only U.S. embassy communities but other private-sector institutions such as universities, research institutions, consulting firms,

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The report in essence is advocating a shift in thinking about foreign affairs— from traditional views of foreign policy as exclusively political, economic, or military to a broader view that addresses issues of science, technology, and health.

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implementation of U.S. foreign policy" (page 20). When budgets are cut, these "minor appendages" are among the first issues to be ignored. In addition, there has been little effort made in general to add new, technical expertise to DOS; efforts at modernization and restructuring have most commonly been centered on traditional foreign policy concerns.

In *The Pervasive Role,* the National Research Council offers several recommendations for making STH issues more central to DOS initiatives and goals. First and foremost, the authors assert, it is necessary for the Secretary of State to demonstrate a commitment to these issues by designing and instituting a policy that highlights STH. For example, they recommend that the Secretary appoint an Unde Secretary for Scientific Affairs who would have "responsibility for ensuring consideration of STH factors in policy formulation, especially during meetings and consultations involving the Secretary and/or Secretary's senior advisors and during day-to-day activities at all levels of the Department" (page 27).

The Pervasive Role also advocates that STH awareness permeate the ranks of DOS. The authors recommend that "the Department's leadership should expect all [Foreign Service Officers] and other officials of the Department to achieve a minimum level of STH literacy and awareness relevant to foreign policy while stimulating attention to STH throughout the Department by establishing promotion and career incentives for successful service in STH-related positions" (page 36).

In addition, the authors recommend that "[t]he Department should assign at least 25 carefully selected Science Counselors to embassies in countries where STH-

nongovernmental organizations, and other groups' information or advisory services abroad. Additionally, bilateral work (governmental or otherwise) of a scientific nature is one area where the possibility for peaceful, nonpolitical exchange is possible.

The Pervasive Role also stresses that it is important the United States remains first in the world in STH knowledge/expertise; to this effect, it highlights the need for additional U.S. funding for STH training and research. The authors fault DOS for not lobbying Congress more effectively about the importance of STH for promoting the international agenda of the United States. While the research capabilities and efforts of the United States remain top-notch, its policymakers tend to separate science from policymaking—even when the issues under discussion (such as food security or nuclear weapons) are perhaps best examined firmly within their scientific contexts. The result, the authors argue, is that U.S. government policy and decision-making has become more political. But without additional financial resources to improve STH capabilities within the DOS, this disjunction between science and policy is likely to remain.

The report in essence is advocating a shift in thinking about foreign affairs—from traditional views of foreign policy as exclusively political, economic, or military to a broader view that addresses issues of science, technology, and health. That DOS requested this report is certainly a step towards this shift. But action will only come after the Secretary of State and the department make the recommended commitment to this vision. **W**

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The World's Water 2000-2001: The Biennial Report on Freshwater Resources

By Peter H. Gleick
Washington, DC: Island Press, 2000. 309 pages.

Reviewed by **Baruch Boxer**

In his second biennial survey of global water resources, Peter Gleick skillfully brings together wide-ranging historical, scientific, technical, institutional, and legal information about key factors and trends affecting water availability and quality around the world. *The World's Water 2000-2001* ranges from descriptions of basic geophysical and hydrological processes to analyses of the implications (economic, political, environmental, social, health, and security) of alternative perspectives on water resources conservation and development. Gleick's clear, well-organized presentation balances (a) consideration of the difficulties faced in estimating present and future water supply with (b) an in-depth assessment of several topical issues—including water and food production, dam removal and ecological restoration, the technological and economic feasibility of desalination, and the limitations and benefits of water reclamation and reuse. The result is a well-focused and informative work that is authoritative while avoiding the excess technical or political baggage typical of other surveys.

After looking closely at the question of international legal and moral grounds for the "human right to water," the book engages its main task by forcefully raising two fundamental questions. First, how and why do we define and measure water availability, use, and distribution the way we do? Second, what assumptions underlie various projections of freshwater demand, and why are there so many inconsistencies among these projections—especially in the compilation and interpretation of water use data? By raising these fundamental issues at the outset (and by carefully reviewing research and the full literature to date), Gleick points up major continuing problems in efforts by governments, international agencies, and the scientific community to establish a reliable information baseline for understanding present and future dimensions of the global water dilemma.

There are still many uncertainties regarding natural variations in water availability for both ecological requirements and the functioning of economic and political systems at various scales. To begin, global estimates of water stocks and flows are approximations at best. As Gleick points out, despite impressive technical advances in monitoring, it is still virtually impossible to measure and combine information on diverse water sources like soil moisture, glaciers, lakes, polar ice, aquifers, and snowpack. Thus, conflict resolution efforts in the Middle East and other "hot spots" are confounded by difficulties faced in trying to distinguish between "relative" and "absolute" measures of natural water "supply," "need," and "use."

Gleick's brief but careful review of international-river-basin-assessment methodology highlights how definitional uncertainties and limitations are seriously undermining well-intentioned multilateral efforts to address transnational water disputes at the basin/watershed level. In it, he shows why the long-sought goal of river basin-defined "integrated water management" on a global scale is so elusive (White, 1998). Here, as in other water policy areas, a major challenge is the appropriately-scaled application of: (a) sophisticated assessment and monitoring technologies, (b) engineering and planning strategies, and (c) market-related policy instruments in response to place- and society-specific water requirements. The challenge is heightened because such water requirements are shaped by often poorly understood political, social, cultural, and ecological determinants and constraints. For all the multilateral efforts over the past three decades to shape effective global water strategies—as well as more recent NGO forays into ambitious "visioning" scenarios[1]—international and domestic water policy efforts still mainly reflect engineering and economic criteria that are increasingly out of touch with the imperatives of global environmental change, demographic trends, and the disruptive local impacts of globalization (especially in developing rural areas).

The topical chapters of *The World's Water 2000-2001* (on food, desalination, dam demolition, and recycling) each nicely illustrate the soundness of Gleick's approach to the problems of understanding relations between the natural and human dimensions of water supply, distribution, and use. In each case, definition of technical issues and choice of remedy are governed as much by subjective factors (social, cultural, political, and institutional) as they are by engineering and scientific knowledge. For example, Gleick emphasizes the importance of asking how and to what extent water issues bear upon such questions as "how much water is necessary to grow different crops" or "how many crops

can be produced on the land." Through this, he convincingly shows that technical data on land, water availability, and irrigation technology contribute beneficially to policy development only to the extent that they illuminate problems of knowledge communication, institutional constraints, economic efficiency, and ecosystem demands. Ultimately, water policy must be thought of as "the nexus between the science of the world's water resources and the political and social implications of water availability and use" (page 19).

Such questioning of commonly-held methodological and measurement perspectives (and their applications in food production, ecological restoration, recycling, and freshwater recovery contexts) is effectively sustained through the seven substantive chapters of *The World's Water 2000-2001*. But the book also fulfills the responsibility of a survey volume, providing facts and figures on many aspects of water distribution, dynamics, conflict, and use. The second half of the book—"Water Briefs" and a "Data Section"— provides timely, comprehensive, and mostly tabular data on diverse water themes. The "Briefs" section, for instance, looks at arsenic in Bangladesh groundwater, fog collection as a water source, the chronology of water conflict through the ages, and the proliferation of water-related Web sites. The book also has an excellent index and is a pleasure to use.

At the outset of the 21st century, we are confronted with ever more pressing problems of water supply, control, hazard, and conservation. While there has been much progress in understanding the interconnections of water science and technology, we are just beginning to appreciate the extent and complexity of the interplay of social and institutional factors and technical response. *The World's Water 2000-2001* provides a useful introduction to the kinds of questions, concerns, and data that are essential for informed involvement of governments, multilateral bodies, and policymakers in meeting the water challenge. We should look forward with anticipation to Gleick's next biennial review. **W**

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[1] See IUCN (2000).

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Managing the Globalized Environment: Local Strategies to Secure Livelihoods

Tiia Riitta Granfelt (Editor)
IT Publications: London, 1999. 192 pages.

Reviewed by **Kelley Sayre**

M *anaging the Globalized Environment: Local Strategies to Secure Livelihoods* is a collection of ten essays that explores the human-environment link in a post-Agenda 21 world.[1]

At the heart of the volume is the concept expressed in Anders Hjort-af-Ornäs and Jan Lundqvist's essay "Life, livelihood, resources and security—Links, and a call for a new order." According to Hjort-af-Ornäs and Lundqvist, "it is the access to the flow of resources from natural capital and their conversion through technology to the required goods and services that constitutes the basic life-support and conditions for livelihoods in all communities" (page 2). The concept that *access to adequate resource flows* is crucial to human quality of life undergirds the book's further environmental security discussions.

The human-environment link is undeniably complex. In order to implement Agenda 21's concept of sustainable development, *Managing the Globalized Environment* argues that the global community must take an interdisciplinary approach to creating development policies that balance the environmental and economic needs of the present with the needs of the future. The book also emphasizes that implementing any new environmental policy requires awareness of existing socio-cultural constructs such as governance and cultural norms. Governance and cultural norms are the guidelines that dictate who will have access

to natural resources, and *Managing the Globalized Environment* provides case-study examples of governance and cultural norms that have either aided in equitable resource distribution or prevented it.

The two most prominent case studies (both situated in Africa) involve internal turmoil that is the product of a weak nation-state. In "Ogoni–Oil, resource flow and conflict in rural Nigeria," Okechukwu Ibeanu describes a heavily oil-reliant nation-state whose actions are threatening the well-being of its people. Due to Nigeria's weak constitution—which defines the state as a "means of production" (i.e., a vehicle for promoting profitable resource exploitation rather than a representative and protector of the general interests of its people)—the Nigerian government is especially prone to special interests and thus to political and social conflict (page 12). Ibeanu argues that, with crude oil exports constituting 80 percent of Nigeria's national wealth, oil interests very often prevail over the security concerns of the Nigerian people (page 16).[2] For example, oil extraction activities have degraded the environment of the Ogoni homeland, and the Ogoni have received limited compensation for the oil itself; the result has been a reduced carrying capacity for the Ogoni environment as well as aggravated Ogoni feelings of injustice. In 1992, the Ogoni people ultimately declared to their federal government that "it is intolerable that one of the richest areas of Nigeria should wallow in abject poverty and destitution" (page 19). Ibeanu's case study exemplifies the disparities that can occur when a state both monopolizes its country's resource flows and values special economic interests over the security of its people.

Another example of internal environmental strife resulting from a weak nation-state is the conflict between pastoral rights and wildlife conservation concerns in Tanzania. In "Environmental awareness and conflict genesis—People versus parks in Mkomazi Game Reserve (MGR), Tanzania," Peter J. Rogers and his co-authors detail how changing values have over time altered the uses of the reserve. Due to lack of funding, Tanzania has been struggling to enforce changing natural resource management scheme from pastoral resource management (state-issued grazing permits) to wildlife conservation and ecotourism. When a grazing permit system broke down in the 1970s, game wardens and conservation officers who were representatives of state

authority viewed the result "as a threat to the MGR's natural resources [and] as a threat to the authority of the Tanzanian state" (page 30). Limited quantities of natural resources pit the pastoralists' claim to the human right of the "preservation of their livelihood" at odds with wildlife conservation efforts (page 47). In fact, the eviction of pastorialists from the reserve in 1977 was a direct result from lobbying by the international conservation community, which was concerned about the degradation of wildlife habitat.

In both the Nigerian and Tanzanian cases, weak governance has created environmental stress—environmental degradation in Nigeria and lack of accessibility to grazing pastures in Tanzania. And this stress, according to Ibeanu, has a direct correlation with social stress. Both essays argue that, in order to achieve sustainability, we must find a way to balance environmental and economical interests in pursuit of better livelihoods.

The discussion of sustainable development in *Managing the Globalized Environment* would not be complete without its treatment of the concerns of indigenous people. Two case studies offer different views on how culture affects how indigenous people cope with increasing globalization and the introduction of a market economy. In "Ethnic groups and the globalization process—Reflections on the Amazonian groups of Peru from a human ecological perspective," Maj-Lis Foller argues that the cultural identities of the 65 ethno-linguistic groups who co-exist in la Selva, Peru are often tied to the land. Traditional ways of life (and their resource consumption) are often different from global influences that change land use patterns and the "systematic harnessing of all natural resources for the continual advancement of global industrial production and trade" (page 64). Modernization and globalization are pushing these people away from not only their land but also their culture.

Foller details how, in order to combat this marginalization, indigenous Peruvians are banding together to protect their ethnicity and to work towards "territorial control and access to natural resources…the central focus of indigenous rights throughout the world" (page 63). The Peruvian state did not even recognize indigenous people until 1957. But the cause of indigenous rights has been favored by more recent developments, such as: (a) the human-environment linkages outlined in
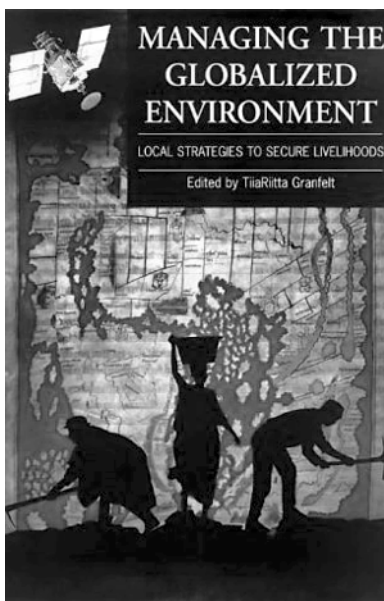
Agenda 21, (b) the growing political power of NGOs representing indigenous people, (c) increasing compliance with the fundamental 1948 Universal Declaration of Human Rights, (d) the establishment of a permanent UN forum for indigenous people, and (e) the UN declaring 1995-2004 as the "Decade of Indigenous People." In the wake of these dynamics and new institutions, perhaps Peru's indigenous people will not be pushed into globalization but will instead have the opportunity to choose between a traditional way of life and a modern one.

In the second case study of indigenous people ("Increasing competition, expanding strategies—Wage work and resource utilization among Paliyans of South India"), Christer Norstrom examines how the Paliyan "culture of independence" has served its people well. The Paliyans live in the Eastern section of the Ghats Mountain range in southern India (known as the Palni Hills) where they combine hunting and gathering techniques with periods of employment on plantations or gathering forest products for market. As a result, most Paliyans have a diverse income and prove to be successful either living in the forest or settling in Tamil villages. The cultural norm of "self-reliance" has made it relatively easy for the Paliyans to continue their way of life in the age of increasing modernization and globalization. These case studies make it apparent that the inherent cultures within the group will help dictate how the group will handle the pressures of modern society.

Cultural success stories are also evident in Eduardo S. Brondizio's "Agroforestry intensification in the Amazon estuary" and in Jannik Boesen and co-authors' "Rules, norms, organizations and actual practices—Land and water management in the Ruaha River basin, Tanzania." The agroforestry case study illustrates the value of local knowledge in cultivating a productive plot in the high flood plains of Amazônia. The resulting plots produce goods (acai, rice, maize, etc.) throughout the year for a period of up to twenty years. What is most remarkable is that, as Brondizio notes, "an acai stand resembles (to an outsider) a regular forest and not an agricultural site" (page 108). Local knowledge of cultivation techniques combined with an understanding of the local ecology and markets has made agroforestry successful in this part of Amazônia.

Jannik Boesen and his co-authors explore the effects of formal (government-sanctioned) and customary (informal, flexible to changing needs) law on natural resources use and sustainability in Tanzania. These two co-existing legal tracks create policy difficulties, as again pastoralists clash with wildlife conservationists. One example highlights the most interesting aspect of this case. Under Tanzania's customary law, the owner of a pond has a duty to protect and maintain the pond. Under its formal law, however, that same person would not be obliged to care for the pond, and could therefore let it become polluted or otherwise degraded. Conflicts have arisen with the rise of formal law, as companies gained formal titles to land and began to operate on it while being unaware of the customary law.

Boesen and his co-authors suggest that customary law (unlike formal law) produces policies that mitigate and even prevent environmental degradation, thus benefiting the entire community. They argue that the introduction of formal law in Tanzania has "thrown a wrench" into the country's environmental policymaking machinery, and that its formal law should be remodeled to be more consonant with the flexible and conservationist philosophy of customary law. As with all policymaking, there are no guarantees that this style of governance would be best suited to solve every environmental problem. It does, however, offer a distinct alternative to Western views of environmental policymaking. Both the agroforestry and Tanzania examples illustrate that environmental protection (and perhaps sustainability) can be achieved when cultural norms take environmental factors into account.

The last three essays (Stefan Anderberg's "Sustainable development, industrial metabolism and the process landscape—Reflections on regional material-flow studies"; Goran Hyden's "Environmental awareness, conflict genesis and governance"; and Uno Svedin's "Culture, cultural values, norms and meanings—A framework for environmental understanding") discuss overarching themes. Anderberg provides detailed charts that analyze the flow of natural resources in society; he declares that more research is needed in order to develop a "holistic" view of sustainable development. Hyden reviews the four main schools of security theory (the realist, the moralist, the liberal, and the populist). Decision-makers often hold the view of the dominant realist theory (which studies "threat, use, and control of military force") (page 154). Hyden suggests that the real challenge is "how to make environmental and other concerns an integral part of the realist equation" (page 155). Lastly, Svedin states that culture is a driving force of human behavior and defines the different permutations of the "cultural perception of nature," ranging from nature being hailed sacred to nature being viewed as profane. Svedin further suggests that those who wish to work towards developing sustainable practices must look to culture for guidance on how to influence human behavior.

In conclusion, *Managing the Globalized Environment* utilizes an interdisciplinary approach that is a model for how decision-makers should approach the creation of policies that will help the global society reach Agenda 21's goal of sustainable development.　W

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ENDNOTES

[1] Agenda 21, in the words of the United Nations, "is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment. Agenda 21, the Rio Declaration on Environment and Development, and the Statement of Principles for the Sustainable Management of Forests were adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janerio, Brazil, 3 to 14 June 1992" (UN, 2001).

[2] See also Ibeanu (2000).

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The Third Force: The Rise of Transnational Civil Society

Ann M. Florini (Editor)
Tokyo: Japan Center for International Exchange; and Washington, DC: Carnegie Endowment for International Peace, 2000. 292 pages.

Reviewed by **Stacy D. VanDeveer**

*T*he Third Force is an insightful, well-organized, and inspiring book. Florini and her collaborators explore the goals and activities of transnational civil society actors and networks, which they call an "emerging third force

in global politics" (after states and private- sector actors).

The book includes an introductory chapter by Florini and P.J. Simmons, a conclusion (by Florini), and six well-written and detailed case studies of the influence of groups and networks in international civil society. These case studies cover: (1) the anti-corruption activities of Transparency International (written by Fredrik Galtung); (2) debates and action around nuclear non-proliferation and the Test Ban Treaty (Rebecca Johnson); (3) organizing around big dams (Sanjeev Khagram); (4) transnational networks and campaigns for democracy (Chetan Kumar); (5) activism around the International Campaign to Ban Landmines (Motoko Mekata); and (6) transnational activism and implementation of human rights norms (Thomas Risse). *The Third Force* also includes an exceptionally useful and comprehensive annotated bibliography (prepared by Yahya A. Dehqanzada) of related literatures. Readers interested in traditional and environment-related security concerns will find all six cases interesting. In particular, the cases of civil society activities around non-proliferation, the landmine ban, and big dams have direct connections to important on-going security and environmental debates.

Perhaps the book's greatest contribution is the authors' repeated demonstration that the interaction between civil society actors and various state actors is essential (and common) for effective transnational cooperation. Too often in international relations and NGO literatures these groups are simply juxtaposed. In cases such as the ban on landmines, transnational anti-corruption efforts, and the domestic implementation of human rights norms, civil society actors could not have accomplished their goals without close cooperation with particular state actors. Had the authors used counterfactual analysis a bit more explicitly, they might have demonstrated this more forcefully. In particular, Thomas Risse's chapter on the domestic internalization of human rights norms shows the central importance of both iterated dialogue and debate between state and non-governmental actors. For Risse, effective transnational politics move over time from nearly exclusive confrontation between NGO and state actors to the diffusion and implementation (by state and non-state actors) of transnational human rights norms.

The case studies in *The Third Force* also demonstrate that the international community does not change state policies and practices directly or alone. These case chapters detail the struggles and activism of domestic groups and individuals (inside and outside of the state) in their efforts to use transnational groups and norms to change domestic politics, policies, and societies. This book

is not about imposing agendas from above or from "'outside'" of national politics. Rather, it is about the dynamic interaction of transnational activism with domestic actors and politics. Florini and her colleagues demonstrate that transnational civil society groups can encourage and enhance domestic political debate and dialogue—not just attempt to dictate them.

Some of the usual criticisms of research about NGO activism and transnationally-networked actors apply to this book, however. For example, because of its lack of attention to cases in which activists failed to influence international agendas, *The Third Force* gives readers little about why and how civil society actors can be marginalized by state actors or ignored by policymakers and societies. Regarding the transnational networks, it also remains very difficult to determine where their boundaries are—the book's authors never really reflect on whom, exactly, is connected to whom (and how).

In addition, the boundaries between civil society and state and private actors are considerably less clear in practice than they are in theory. For example, is a state official who cooperates with NGO activities in the civil society network? Or is she best thought of as a state actor? Does it matter? Lastly, not all transnational civil society groups act as the "global conscience" that Florini and Simmons posit them as (page 4). Not all such actors are quite so civil, for example. NGOs and civil society networks (and some of the individuals within them) have pathologies as well as virtues. Research on NGOs and civil society remains generally silent about the less virtuous goals and tactics of some actors. Are we to believe, for example, that civil society actors are entirely altruistic? Are we to assume that they never bend or break laws—or use coercive force—to achieve their goals?

But in sum, Florini's *The Third Force* is strongly recommended for all those interested in transnational activism of individuals, NGOs, networks, and policymakers. The book is an excellent addition to undergraduate and graduate syllabi. It encourages students and other citizens to engage international politics with a dynamic and effective combination of idealism and pragmatism. **W**

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# How Americans View World Population Issues: A Survey of Public Opinion

By David Adamson, Nancy Belden, Julia Da Vanzo, and Sally Patterson
Santa Monica, CA: RAND, 2000. 123 pages.

Reviewed by **Simona Wexler**

Through its *Population Matters* project, RAND has published this intriguing survey of how Americans view demographic issues and trends in the context of U.S. international aid. While the sample of individuals interviewed for the project is fairly small (about 1,500 people), *How Americans View Population Issues* nonetheless provides useful insights into how much Americans know and care about population issues. The questions of the survey were targeted at (a) the general views on U.S. international economic assistance and its recipients, (b) general knowledge about population issues such as demographic trends, and (c) specific issues such as family planning and abortion.

According to this survey, 59 percent of Americans support international economic assistance—the highest level since 1974. In particular, Americans consider humanitarian programs and health-related programs addressing environmental, children's, women's, and human rights issues to be particular priorities. Slowing the birth rate in the developing world, however, seemed to respondents not as important an issue: only 22 percent of the respondents felt it was of critical concern.

One of the most interesting findings in *How Americans View Population Issues* is the lack of knowledge Americans have about the world's demographic trends. Only 14 percent of the interviewees were aware that the world population reached the six billion mark, and roughly 40 percent did not know the current size of the world's population. Furthermore, many respondents did not seem to be able to correctly estimate the rate of population growth. In fact, almost half predicted world population will double in the next 20 years, far sooner than the estimated prediction of 50 years. However, the survey indicated that Americans do believe the world is overpopulated. While they do not perceive rapid population growth to be as severe a problem as hunger or disease, 27 percent of the individuals surveyed believe it contributes to other problems such as environmental
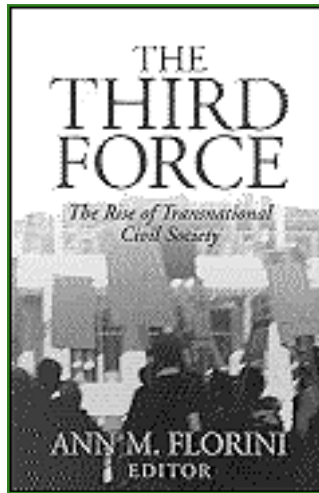
degradation, civil unrest, and slow economic growth.

Family planning was a major focus of the survey. Fully 92 percent of Americans favor both (a) the right of an individual and a family to decide the number of children they will have in their lifetime, and (b) that information to achieve that goal should be available to all. Abortion, however, remains controversial and divisive for Americans, who seem evenly split on this issue. Almost half of those interviewed for this survey opposes abortion except when rape, incest, or danger to the mother's life are involved. The other half does support unfettered legal access to abortion. However, the survey

interesting findings of the survey is the confusion among the respondents about the term "family planning." While 46 percent believes that the term includes abortion, 52 percent believes it does not. Attitudes of the American public regarding congressional actions on international family planning also reflect a deep divide. While 50 percent did approve of the 1996 congressional vote to reduce funding for family planning, 51 percent disapproved of Congress denying funding to family planning organizations that provided abortions (despite the fact that no U.S. "family planning" assistance funding goes to support abortion).

One of the most interesting findings in *How Americans View Population Issues* is the lack of knowledge Americans have about the world's demographic trends.

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seems to indicate that abortion is not a black and white issue, and that many Americans approve or disapprove of it depending on the circumstances. Supporters of legal abortion believe that the procedure can save women's lives, while opponents are convinced that women use it as a contraceptive method and that its legality promotes sexual promiscuity among teenagers and unmarried couples.

However, the survey also found that two-thirds of the interviewees that oppose abortion *approve* of funding family planning programs. In fact, one of the most

Despite the relatively small number of the people interviewed for it, *How Americans View Population Issues* is a well-conducted survey that sheds light on the views and attitudes many Americans have on U.S. international economic assistance. While the majority of Americans do support economic and family planning assistance to the developing world, it is clear that most Americans are not highly informed on a variety of issues regarding the topic. The survey also highlights important findings for the policy community, which should pay close attention to some of its more perplexing findings. Few of those

Contagion and Stability: An ECSP Policy Brief

The Environmental Change and Security Project is publishing a policy brief based on findings and recommendations from "Contagion and Conflict," a two-day simulation conference in May 2001 that explored what a massive plague outbreak in India would mean for regional and international security.

Sponsored by ECSP, the University of Michigan Population Fellows Programs, and the U.S. Army War College at Carlisle, Pennsylvania, "Contagion and Conflict" attracted high-level representatives from the U.S. government, foreign embassies, and nongovernmental organizations as well as leading scientists, scholars, and researchers. Among the participants were Helene Gayle of the Centers for Disease Control and Prevention, Charles Jess of the U.S. State Department, and Ajai Malhotra of the Embassy of India. Participants divided into teams (representing India, the United States, international organizations, and nongovernmental organizations) to formulate and negotiate responses to a scenario of pneumonic plague outbreak in the Indian state of Andhra Pradesh—an outbreak that spreads because of migration and threatens to destabilize the region.

The policy brief will be published in autumn 2001. To request a copy or for more information, please contact ECSP at ecspwwic@wwic.si.edu or call 202/691-4130.

questioned, for instance, are aware about growth and population size despite the focused international attention on the "Day of Six Billion" in October 1999. From the survey it also emerges that the general public has yet to make the important connection between population issues and environmental degradation. And while there is strong support for the funding of international family planning, half of the respondents did not object to congressional cuts for family programs in the developing world. While this opinion may be due to the fact that most Americans overestimate what the U.S. government contributes to foreign aid, it is clear that the public should be better informed about the subject. Policymakers should also prioritize educating the public about the benefits of providing family planning—which (among other things) has decreased the number of abortions in countries such as Russia, Bangladesh, Hungary, South Korea, and Kazakhstan. Finally, it is plain from the survey that a clear definition of "family planning" is much needed, and that Americans are uncertain whether or not the term encompasses abortion. **W**

Simona Wexler is a former project associate for the Environmental Change and Security Project.

Urbanization, Population, Environment, and Security: A Report of the Comparative Urban Studies Project

Christina Rosan, Blair A. Ruble, and Joseph S. Tulchin (Editors)
Woodrow Wilson International Center for Scholars, Washington, D.C. 2000. 98 pages.

By Richard Thomas

The 21st century is taking shape as the urban century. The consensus among demographers is that more than half of the world's population now lives in urban areas, and both the United Nations and the World Bank predict that by 2050 that figure will be above 85 percent. Urbanization is already an important security concern and will only become more so as the balance of the world's population is born in or migrates to the cities.

The Comparative Urban Studies Project at the Woodrow Wilson Center was founded in 1997 with the purposes of (a) identifying factors that make cities centers of violence and poverty, and (b) proposing policy

recommendations for making urban areas more secure and sustainable. In *Urbanization, Population, Environment, and Security*, the Project presents articles by three experts that examine a range of urban issues—including resource and environmental degradation, population growth, violence, and international crime.

Ellen M. Brennan-Galvin, Chief of the Population Policy Section at the United Nations Population Division (and a Fellow at the Woodrow Wilson Center starting this fall), opens the report with an engaging analysis of the dynamics of megacities—those cities whose populations exceed ten million. The number of megacities is growing, the size of these cities is becoming larger, and most of them are in the developing world. Brennan-Galvin describes general trends in the development of the megacity phenomenon since 1950 and briefly examines various concerns and factors involving this development. She argues that, while large cities generally save resources relative to small cities, they also bring with them a host of environmental difficulties contributing to water and air contamination as well as solid waste management problems.

Michael Renner of the Worldwatch Institute follows by examining the causes of worldwide migration to cities. He cites environmental degradation, economic scarcity, and social inequality as the primary drivers. Starting with environmental stresses, Renner defines water scarcity and describes its causes, from increased demand on groundwater to climate change. He then describes how water scarcity pressures people to abandon rural areas in favor of cities. He also discusses economic equity and land distribution as a contributing factor. Citing specific examples of massive wealth concentration in the developing world, Renner explores the compounded environmental effects of peasants being forced to exhaust marginal lands through farming. Going further into wealth distribution inequalities, Renner details how unemployment and economic inequity impel migratory pressure. Finally, he concludes with a treatment of the ready availability of light weapons, which encourages greater violence by increasing the potential force available to the poor and dislocated.

Alan Gilbert, a professor of geography at University College, London, argues in the report's final article that there is no verifiable link between urbanization and security. He attempts to debunk what he terms eight "myths" regarding urbanization. These "myths" are: (1) migration to urban areas creates social ills by condemning migrants to live in poverty and mental dislocation; (2) impoverished shantytowns are breeding grounds for radicalism; (3) runaway demands for social services and

infrastructure in growing cities produce political polarization, urban social movements, and revolution; (4) austerity riots are a new urban social movement; (5) urbanization encourages democracy; (6) urbanization reduces living standards; (7) urbanization increases crime; and (8) large cities magnify every kind of problem.

Although primarily concerned with urban growth as it relates to violence and poverty, Gilbert does touch on environmental themes. In terms of environmental impact, Gilbert argues against any conclusive connection between mere urban growth and environmental degradation. He uses the example of air pollution, pointing out that some large cities have an air pollution problem while others do not. Gilbert asserts that cities with air pollution problems have obvious contributive factors other than sheer size—such as climate factors, large manufacturing sectors, or the substantial burning of coal for energy.

The report also is introduced by a series of policy briefs. The most interesting of these policy briefs (written by Peter Rogers of Harvard University, Hynd Bouhia of the World Bank, and John Kalbermatten of Kalbermatten Associates) outlines solutions to the scarcity of clean drinking water faced by many cities in the developing world. These solutions include: (a) reducing water-system loss through increasing distribution efficiency and eliminating theft; (b) increasing prices to discourage wasteful water use and encourage user efficiency; and (c) diverting water from highly wasteful irrigation to municipal use. Rogers, Bouhia, and Kalbermatten also explore the various obstacles that have prevented widespread implementation of what they consider to be these basic problem-solvers.

Urbanization, Population, Environment, and Security is a good report, presenting several views on the problems of global urban growth as well as describing in general and approachable terms the facets of this complicated issue. It serves as an excellent springboard for (a) those who are interested in learning about the consequences of accelerating urbanization in the near future, or (b) those already educated on the matter and interested in a review of current scholarship.

Richard Thomas is production editor for the Environmental Change and Security Project and the Cold War International History Project at the Woodrow Wilson Center.

Environment Matters:
Conflicts, Refugees & International Relations
By Shin-wha Lee

World Human Development Institute (WHDI)
Seoul and Tokyo: WHDI Press. 2001. 225 pp.
Email: whdi8802@hanmir.com

In *Environment Matters*, Shin-wha Lee attempts to raise environmental and human security issues as a major research agenda in international relations. In this comprehensive and in-depth study, Lee focuses specifically on the environment-conflict linkage instead of the more general relationship between environmental decline and negative political and social consequences, in order to more convincingly illustrate that environmentally-induced conflicts ("eco conflicts") are a major threat to security.

The goals of the book are: (1) to provide a clearer conceptual idea of what environmental security actually means; (2) to add, through case study analysis of environmentally displaced persons in Sudan and Bangladesh, to the short-supply of quantitative empirical evidence supporting the interrelationship of population, the environment, and conflict; and (3) to assess the role of international cooperation for environmental protection initiatives and opportunities to promote regional international security and peace.

FORTHCOMING VOLUME FROM THE WOODROW WILSON CENTER PRESS

Environmental Peacemaking
Ken Conca and Geoffrey D. Dabelko, Editors

Can environmental cooperation be utilized as a strategy to bolster regional peace? A large body of scholarly research suggests that environmental degradation may catalyze various forms of intergroup violent conflict. In contrast, there is almost no systematic research on an important corollary: that environmental cooperation may be a useful catalyst for broader processes of regional peacemaking. Yet there is a strong basis in theory to think that environmental problems can be exploited to make peace through several channels: enhancing trust, establishing habits of cooperation, lengthening the time horizons of decision-makers, forging cooperative transsocietal linkages, and creating shared regional norms and identities.

We have little knowledge of how to tailor environmental cooperation initiatives to speak specifically to the problem of violence. Even more importantly, we may be missing powerful peacemaking opportunities in the environmental domain that extend beyond the narrow realm of ecologically induced conflict. We know that international environmental cooperation can yield welfare gains. But can it also yield benefits in the form of reduced international tensions or a lesser likelihood of violent conflict? Such benefits could be a potentially powerful stimulus to environmental cooperation, at a time when such a stimulus is badly needed.

—Ken Conca, "The Case for Environmental Peacemaking"

This volume examines the case for environmental peacemaking by comparing progress, prospects, and problems related to environmental initiatives in six regions. Although the regions vary dramatically in terms of scale, interdependencies, history, and the essence of insecurities, each is marked by a highly fluid, changing security order—creating potential space for environmental cooperation to have a catalytic effect on peacemaking. Among the volume's key findings are the following: that substantial potential for environmental peacemaking exists in most regions; that there can be substantial tensions between narrower efforts to improve the strategic climate among mistrustful governments and broader trans-societal efforts to build environmental peace; and that the effects of environmental peacemaking initiatives are highly sensitive to the institutional form of cooperative activities.

TABLE OF CONTENTS

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MEETING SUMMARIES

RUSSIAN ENVIRONMENTAL ACTIVIST FACING CHARGES VISITS WILSON CENTER

*Featuring **Alexandr Nikitin**, Bellona Foundation and the St. Petersburg Environmental Human Rights Centre*

The legacy of radioactive military waste produced by the Russian Northern Fleet poses a great threat to the region surrounding the fleet's bases in Northwest Russia and the Barents Sea, according to former Russian Navy submarine captain and environmental activist **Alexandr Nikitin**. Nikitin, now with the Bellona Foundation, a Norwegian environmental nongovernmental organization, visited the Woodrow Wilson Center and spoke about the August 2000 sinking of the Kursk nuclear submarine as only the latest radioactive threat in the region.

Of the 110 Russian nuclear submarines no longer in service, Nikitin noted that 72 still have fuel in their reactors—and 30 of those are in critical condition and in danger of sinking. As with the Kursk, water could break the hermetic seal around these reactors, allowing radionuclides to escape into the surrounding marine environment. The result of such an event, said Nikitin, would be an ecological and humanitarian catastrophe.

In the past five years Nikitin has been charged repeatedly in Russia with treason for passing state secrets during his preparation of the 1996 Bellona Foundation report *The Russian Northern Fleet: Sources of Radioactive Contamination.* Nikitin and his two Norwegian co-authors maintain all the information contained in the data-rich report came from open sources. Although the case against him has always been thrown out by numerous Russian courts (including the country's Supreme Court) for lack of evidence, St. Petersburg prosecutors have recently attempted to reopen the case. Nikitin, who spent almost one year in prison awaiting his initial trial, is at risk once again.

Nikitin's legal troubles are indicative of increasing efforts by the Russian government to heighten secrecy and discourage those gathering environmental data in Russia. Russian President Vladimir Putin has suggested that environmental groups provide convenient cover for Western intelligence agencies. Nikitin views his case not only as a violation of his individual rights, but also as part of a systemic deprivation by the Russian government of the rights of the population both to information and to redress for environmental catastrophes.

As environmental and human rights issues have grown intertwined in recent years in Russia, Nikitin (with support from Norwegian and Russian colleagues) has established the St. Petersburg Environmental Human Rights Centre. In coalition with other groups throughout Russia, this Centre seeks now to advance the collection of Russian environmental data and to protect those who do so. The Centre and the newly formed Environment and Human Rights Coalition (a) provide advice to communities and individuals in need of legal representation stemming from environmental activities, (b) gather and analyze environmental data throughout Russia's regions, and (c) train other lawyers in the effective strategies developed in the course of the Nikitin case.

Editor's Note: Starting in September 2001, Alexander Nikitin will be a Galina Starovoitova Fellow on Human Rights and Conflict Resolution with the Kennan Institute for Advanced Russian Studies at the Woodrow Wilson Center.

20 September 2000

WILSON CENTER HOSTS FORUM ON HIV/AIDS IN SOUTHERN AFRICA

*Featuring **Makate Sheila Sisulu**, South African Ambassador to the United States; **Ron Dellums**; President, Healthcare International Management Company, Chair; President's Advisory Council on HIV/AIDS; and former Congressman; and **Dr. Anthony Fauci**, Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health (NIH)*

The number of HIV/AIDS cases in Southern Africa continues to grow at an alarming rate. Seventy percent of all people with HIV worldwide live in Southern Africa. South Africa, with more than 4 million people infected (1 million of whom are women between the ages of 20 and 29), has the largest and fastest-growing HIV/AIDS population in the region. In neighboring Botswana, 35 percent of adults have HIV/AIDS. The disease has also afflicted more than 10 percent of the adult populations in 15 other African countries.

The Wilson Center Director's Forum "HIV-AIDS and Human Security in Southern Africa" raised awareness of the disease's extent and consequences and offered an opportunity to discuss potential solutions. More than 150 people attended and many more watched this forum on local television and on the Center's first live Web cast. Some viewers also submitted questions via e-mail for the panelists to address during the program.

Obstacles to Eradicating AIDS

Both Her Excellency **Makate Sheila Sisulu** and **Ron Dellums** emphasized that the cycle of poverty that plagues Africa prevents proper prevention and treatment of HIV/AIDS. Sisulu said that Southern Africa lacks the proper health, transport, and education initiatives needed to combat the problem. Dr. **Anthony Fauci** agreed that HIV/AIDS cannot be addressed in a vacuum and that poverty and other conditions also must be addressed. He added that, while educational campaigns aimed at prevention in some developing countries have mainly targeted women, these women often face cultural obstacles to using preventive methods (such as the inability to request that their men use condoms during sex).

Throughout the world, stigmas about HIV/AIDS have cultivated denial, leading to stereotypes and a general reluctance to talk about the disease. Sisulu noted that negative stereotypes abound despite legislation in South Africa outlawing discrimination against AIDS victims. Dellums urged people to deemphasize the moral aspects of HIV/AIDS (such as racism, sexism, and homophobia) and instead to view the disease as a global health and security issue.

Sisulu also warned that the approaches suitable for developed countries would not necessarily work in Africa. "When you have populations who are illiterate and you unleash on them these kinds of drugs, we unleash serious problems upon that community," she said. "Affordability aside, you need roads…clinics… doctors."

Fauci explained that the human immunodeficiency virus (HIV) inserts its own genetic code into the body's immune system cells, leading to the destruction and/or functional impairment of those cells. When a person's immune system cannot properly function, simple and generally undetectable ailments can become deadly. In developed countries, drugs are available to extend life expectancy, but no drug can cure the disease and the patient requires perpetual treatment. Fauci added that cumulative toxicity (in which many patients cannot tolerate available AIDS drugs) makes HIV/AIDS even more difficult to treat.

Efforts in South Africa and beyond

Sisulu said that a comprehensive HIV/AIDS program is in place in South Africa that focuses on prevention, treatment, care, and research for vaccines; the program is a collaborative effort among the 14 countries of the Southern African Development Community. South Africa's budget for this program has increased seven-fold in the past five years, and Sisulu expects the budget to increase again as much over the next five years.

In addition to these budget increases, South African President Thabo Mbeki has chaired the Partnership

Cosponsored by the Woodrow Wilson Center's Africa Project, the Environmental Change and Security Project, and Dialogue

Against AIDS, a project that unites government ministers with the private sector to discuss what concrete actions the public and private sectors have taken to combat HIV/AIDS. Sisulu said that President Mbeki has instructed all governmental sectors to fund their own HIV/AIDS programs so that education, defense, and other individual sectors sponsor programs in addition to what the national government contributes. Sisulu also publicly addressed the controversy over Mbeki's questioning of the link between HIV and AIDS early in 2000. She said that the president was misunderstood and that he was simply calling for a comprehensive solution, a theme she reiterated throughout this forum.

Some countries have succeeded in bringing HIV/AIDS rates down

(From Left) Ron Dellums, Lee Hamilton, Makate Sheila Sisulu, Dr. Anthony Fauci

and can serve as models for other countries. Fauci said that private organizations have partnered with the governments of Uganda and Senegal to focus on education, testing, and condom distribution. Senegal has implemented a comprehensive treatment program for all sexually-transmitted diseases, including HIV/AIDS.

Fauci noted that in the United States, the NIH spends 12 percent of its entire budget (some $2.1 billion) on HIV/AIDS research. Currently, 17 HIV drugs have been approved and are in use nationwide. In addition, pharmaceutical companies have paired with government agencies to increase availability of treatment.

Suggested Solutions

Sisulu appealed for international cooperation in confronting the Southern African HIV/AIDS crisis. "I want to underscore the need to increase partnerships and collaborative action," Sisulu said, "and to respect and accept the fact that African countries…are doing the best we can with the limited resources that we have. Therefore, work with us! Work with us so that we are able to work with our people. We, as a government, cannot manage this pandemic on our own."

Sisulu added that Southern African countries oppose

additional loans to deal with HIV/AIDS because loans only lead to more debt and dependency. She urged the international community to assist the region in a sustainable way. Fauci suggested partnering nongovernmental and governmental organizations to make HIV/AIDS drugs deliverable and usable in developing countries.

Sisulu also emphasized the need for HIV prevention campaigns to target men more effectively. Fauci agreed that men should share the burden of prevention, adding that something must be done to help change the mindset of how men view and treat women in these countries.

Dellums suggested a Marshall Plan approach (the 1948 U.S. plan that sent billions of dollars of foreign aid to Western Europe in the wake of World War II) to the crisis. He proposed a large-scale public-private partnership that would infuse billions of dollars into Southern Africa to improve roads, health care, and education as well as to provide training for program sustainability. His plan also contains a debt forgiveness component in order to give the region freedom to build an infrastructure to cope with HIV/AIDS and to improve the quality of life.

29 September 2000

ENVIRONMENT, POPULATION, AND CONFLICT: ASSESSING LINKAGES

*Featuring **Thomas F. Homer-Dixon**, Director, Peace and Conflict Studies Program, University of Toronto; and **David Dessler**, Professor of Political Science, College of William and Mary*

Negros Island in the Philippines has suffered in the last two decades from severe erosion and cropland destruction. According to Thomas Homer-Dixon, the practice of swidden (slash-and-burn) agriculture on the island in combination with population growth and migration has played a major role in this environmental degradation. And this degradation in turn has combined with extreme poverty and weak governmental structures to contribute to Negros' rural insurgency and guerrilla warfare and violence.

Homer-Dixon presented some of these key findings from his research projects on environmental scarcity and violence (summarized in his 1999 Princeton University Press book, *Environment, Scarcity, and Violence*). Using the Philippines as a case study, Homer-Dixon also detailed a two-step causal model of environmental contributions to violent conflict within developing countries. Political scientist David Dessler followed by arguing that, in order to understand and respond to environmental stress and scarcity more effectively, researchers such as Homer-Dixon must develop broader theories using the strategies of other social scientists, including historians.

Thomas Homer-Dixon

Three Forms of Resource Scarcity

Thomas Homer-Dixon focused on the three key renewable resources (cropland, fresh water, and forests) within the context of three sources of scarcity. First, he identified "supply-induced" scarcity, which he said is caused by the loss of resources (such as lack of quality drinking water or fertile land). Population growth or migration (or both combined) can also increase the per-person demand, leading to demand-induced scarcity. Third, a skewed or disproportionate distribution or access to resources can lead to what Homer-Dixon termed "structural scarcity."

For Homer-Dixon, there are two types of interactions between the three types of scarcities. The first is "resource capture," which occurs when access to resources shift to favor powerful groups—a process economists call "rent-seeking." "Ecological marginalization," on the other hand, takes place when the combined impact of population growth and unequal resource access leads to a decrease in quality and quantity of renewable resources, resulting in increased environmental scarcity. Such scarcity, Homer-Dixon explained, can lead to forced migration into ecologically-marginalized areas.
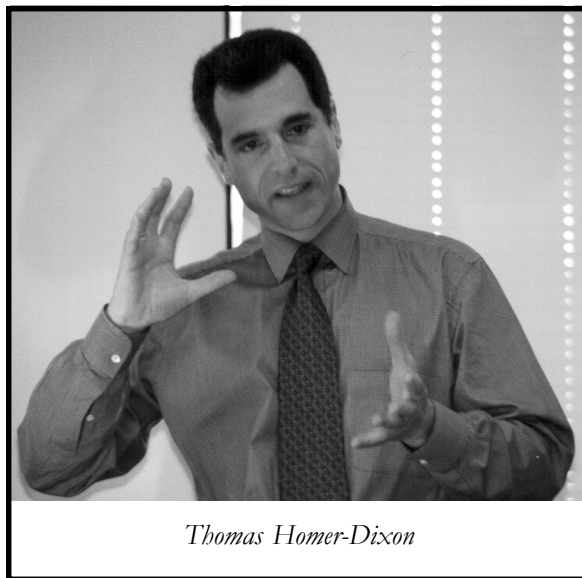
The Case of Negros

Homer-Dixon highlighted the case of Negros, where swidden agriculture is the primary method of farming. This method did little harm when Negros had lower population densities, as the burned land had time to regenerate while other land was cultivated. With rapid increase in population and migration, however, the fallout from swidden agriculture on Negros has been devastating. Environmental consequences have included (a) erosion slides, (b) flash floods, (c) washed out bridges and other structures, (d) increased silt burdens, (e) coral reef destruction, and (f) fish stock depletion. Homer-Dixon said that, in the Philippines, such ecological problems have created a vicious cycle of migration, both further upland as well as into squatter settlements of large urban areas such as Manila. He added that these migration flows appear to have fueled both urban unrest and rural insurgency.

Factors Influencing Environmental Scarcity

While environmental scarcity is not a direct cause of violent conflict, Homer-Dixon argued that in the context of other variables such scarcity can be a contributing factor to violence. He outlined two distinct categories of such variables. The first category includes: (a) the general adaptability of a state's social structures; (b) the stability of its financial markets; (c) autonomy of the state; (d) the strength of social capital (such as norms, trust, and reciprocity); and (e) the strength of a social norm of responsibility for the greater good. The second category is tied to relations among groups: (a) the strength of pre-existing ethnic divisions; (b) a conception of justice by those challenging the government (as opposed to traditional peasant resignation or fatality); (c) the resources and organizations of the challengers to the status quo; and (d) the quality of leadership.

Methodological Issues: Exogenous vs. Endogenous

David Dessler presented an overview of what methodology does to assist social science research and where he feels Homer-Dixon's methodology falls short. First, Dessler outlined the two questions methodology seeks to answer in the case of environmental stress. The first question is predictive, and asks if researchers can predict future levels of conflict from environmental trends. Second, the causal (or explanatory) question asks how environmental change might provoke or catalyze conflict. From the methodological questions, two types of information emerge: (a) descriptive (describing the subjects under study); and (b) a broader, contextualizing information that offers general knowledge of what the researcher is studying.

This methodological discussion leads to an examination of exogenous and endogenous boundary conditions and their impact on predictions of social/human behavior. The key problem with Homer-Dixon's work, claimed Dessler, is that only one of the three scarcities discussed in his environmental scarcity theory is exogenous, and therefore unaffected by other social factors. Supply-induced scarcity is exogenous because it deals with natural resources and has nothing to do with human behavior. But the remaining two scarcities—demand-induced and structural—are endogenous conditions that are affected by human activities.

In conclusion, Dessler detailed four actions that could considerably improve theory (and broaden the debate without diminishing the quality of the data) in the field of environmental scarcity research. First, Dessler argued, researchers must conduct detailed narratives of individual cases of conflict using existing theoretical work as a guide, with the aim of creating data that can be used for competing theories with equal effectiveness. Second, Dessler said that the field must borrow from social scientists the informal terminology of strategic choice theory, wherein actors have preferences and beliefs and the environment constitutes actors and information. Third, he said that the field must also borrow the concern for evidence that marks the historian's research. Finally, Dessler advised that researchers avoid methodology that is too restrictive. Dessler agreed with the scope of Homer-Dixon's research, but pressed for a more finely-detailed and exacting methodology to avoid discrepancies.

A lively discussion followed the two presentations, in which a primarily practitioner and policymaker audience that works in the field of environmental stress and/or violent conflict questioned the applicability of Homer-Dixon's research for predictive value. A commonly-voiced opinion held that early warning indicators have thus far been unsatisfactory; participants as well as the two speakers agreed that much more research with a more refined methodology is needed to rectify this deficiency. **W**

VANISHING BORDERS: PROTECTING THE PLANET IN THE AGE OF GLOBALIZATION

*Featuring **Hilary French**, Vice President for Research, Worldwatch Institute*

Hilary French, a prolific author on environmental issues, presented the findings of her new Worldwatch Institute Press book *Vanishing Borders: Protecting the Planet in the Age of Globalization* to a broad audience of students, academics, policymakers, and representatives of international nongovernmental organizations as well as private industry. French's book attempts to answer two related questions: What is the impact of globalization on the environment? And which policy responses are needed to address this impact?

Globalization: A World of Challenges and Opportunities

French called "globalization" a term not universally understood, and defined it as the increased flow of goods, ideas, and earth changes across international borders. She then identified four such "flows" that have an impact on the health of the planet: (1) rapid growth in trade; (2) capital flows; (3) ecological flows (such as invasive species, air, and water pollution); and (4) the flows of information (such as e-mail and the Internet). According to French, these flows present both broad challenges and significant opportunities for citizens and policymakers alike.

French cited three such challenges. First, the current economy is environmentally unsustainable, and globalization is further exacerbating its devastating impact. Second, hazardous industries are increasing in those countries with weak environmental standards and lax enforcement ability. Third, concerns about how environmental accords such as the Kyoto Protocol might retard economic competitiveness are hampering efforts to address climate change. But French cited current opportunities as well, including: (a) alternative power sources (such as wind power in India); (b) natural resource commodities growth (such as the rise in Mexico of organic agriculture); and (c) information flows (which have spurred an increase in citizen activism and environmental movements). French pointed out the irony of the 1999 Seattle protesters using the very technology that they condemned in widening their call for action against globalization.

Finally, policy challenges lie ahead. French argued that environmental reform is needed within most global economic institutions, from the World Trade Organization to the World Bank to private lenders and investors. International environmental treaties also must be more specific than current ones, which are vague and/or lax in their monitoring and enforcement standards. And the role international nongovernmental organizations (NGOs) play in global governance must be recognized through procedural rights and increased partnership among the private sector, NGOs, and governments.

A lively discussion session followed, with many participants citing the role of other factors in this globalization and environment relationship, including population growth and migration, international crime rings, human health consequences, the attention (or inattention) of the media, and whether or not a global consensus exists on these issues. In response, French argued that government must play a crucial role in managing globalization, and that capacity-building is being hampered by societal and governmental institutions that lack the wherewithal and/or the political will to address some of the above concerns. French also eloquently outlined some of the principle concerns that environmentalists have with globalization and identified some key policy actions needed to address these concerns.

TRADE AND THE ENVIRONMENT: INSTITUTIONAL COOPERATION

*Featuring **Hussein Abaza,** Chief, Economics and Trade Unit, United Nations Environment Programme (UNEP), Geneva, Switzerland*

Representatives from environmental nongovernmental organizations and the private sector discussed with Dr. **Hussein Abaza** how environmental and trade institutions can improve cooperation and give a voice to each other in their deliberations.

Cooperation between Trade and Environment Camps Needs Improvement

Abaza argued that cooperation among international institutions on trade and environment issues is still very spotty. Negotiators for multilateral environmental agreements (MEA) commonly invite only environmental people to their meetings, while World Trade Organization (WTO) negotiators only include those interested in trade. While UNEP and the Convention on Biological Diversity have requested observer status at the WTO's TRIP (trade-related aspects of intellectual property) agreement discussions, this participation has not been approved to date. Additionally, MEA negotiators have no mechanism through which to ask the WTO for a preliminary position on a proposed measure's acceptability within the trade rules. [*Editor's note: UNEP hosted a meeting 23 October 2000 in Geneva with both trade and environment officials to address potential synergies.*]

Abaza indicated that the best approach for reconciling trade and environmental interests is to develop a process that meshes these interests instead of pressing first for institutional reform. Abaza also noted that his Economics and Trade Unit of UNEP is focused on capacity development in developing countries: it has established a joint project with the United Nations Conference on Trade and Development (UNCTAD) to develop capacity and is conducting training at the national level. Funded by Norway, Sweden, Canada, and others, the project has the objective of building confidence between the North and the South.

Finally, Abaza introduced a trade and environment workbook that the Economics and Trade Unit of UNEP is developing. UNEP is currently seeking input from interested groups around the current draft of this workbook, which is posted on the UNEP web site. The organization hopes to finalize it shortly.

Discussants identified two issues: (1) How do we improve environmental standards in a way that achieves environmental objectives, allows economic growth, and does not run afoul of the trade rules? (2) How should we define the WTO's relationship to international environmental issues? One participant noted that one of the causes of the conflict is that, while the trade agenda seeks to promote deregulation, environmental agendas are most often regulatory. W

Cosponsored by the Environmental Change and Security Project and the Wilson Center's Global Inclusion Initiative

New Think Tank Focusing on Environment and Sustainable Peace

Building bridges across the Atlantic on global environmental issues is the mission of Adelphi Research, the recently established not-for-profit think tank on sustainable development based in Berlin, Germany. Adelphi Research focuses in particular on global environmental change and international environmental regimes. It utilizes research, public policy consulting, and policy dialogues to foster transboundary cooperation on sustainable resource management. The institute's program on "Environment and Sustainable Peace" is composed of a series of research and consulting projects and dialogue forums conducted on behalf of a variety of international organizations and national governments. Adelphi Research is also a partner in a multidisciplinary research team analyzing the impacts of extreme weather events (Security Diagram) and quantitatively linking environmental stress, susceptibility, and crisis. The institute is directed by Alexander Carius (former director of Ecologic) and Walter Kahlenborn. Senior scientists with different academic backgrounds form the core of the consulting team.

For information, e-mail: office@adelphi-research.de
Internet: http://www.adelphi-research.de

ENVIRONMENTAL SECURITY: A DEVELOPING COUNTRY PERSPECTIVE

*Featuring **R.K. Pachauri**, Director, Tata Energy Research Institute (TERI) and Vice Chairman, Intergovernmental Panel on Climate Change (IPCC); and **Richard Elliot Benedick**, Deputy Director, Environmental and Health Sciences Division, Pacific Northwest National Laboratory and President, National Council for Science and the Environment*

"National security" is not simply a measure of military power or geopolitical strength—it also has major social, cultural, and human dimensions and implies a basic subsistence level and sustainable livelihoods, according to Dr. **R.K. Pachauri**, Director of the Tata Energy Research Institute in New Delhi, India. Pachauri discussed the concept of environmental security and what it means for the "silent majority" of the earth—the poor of the developing countries. Ambassador **Richard Benedick** served as discussant.

For the 2.8 billion people who live on less than $2 a day, environmental conditions and personal health are intimately linked to economic status. But where precisely is the nexus between poverty and environmental stress? Do we understand the links between poverty and natural resources? Can the poor take steps to ensure environmental security? For Pachauri, asking such questions is a critical step towards understanding the link between environmental security and poverty.

Poverty and Environmental Stress: Intertwined Problems

Pachauri broadly defined "environmental security" as the minimization of environmental damage and the promotion of sustainable development, with a focus on transboundary dimensions. "Environmental stress"—an important factor in this equation—is caused both by environmental resource scarcity (such as deforestation) and also by environmental resource degradation (such as polluted water). Economic vulnerability and resource dependency play key roles in the link between environmental change and the potential for violence and insecurity in the developing world. Developing countries also usually lack the infrastructure and institutions to respond to crises, thereby increasing the chance of violence. The majority of such disputes thus far have been solved amicably, but Pachauri stressed that this might not be the case in the future.

Pachauri then identified five areas where poverty has either exacerbated or been exacerbated by natural resource stress. First, the continuing struggle to provide food and basic needs is increasing land degradation in the developing world. (In India, for instance, TERI researchers found that twenty-seven percent of soil cover currently suffers from severe erosion.) Second, worsening pollution increasingly impacts air quality, with vehicular traffic and industrial expansion the key contributors. Acid rain resulting from such pollution has become a critical issue in the South Asia region. Third, world climate change that has led to a rise in both temperature and sea level holds dire consequences for South Asia coastal regions. In Bangladesh, for example, hundreds of people are killed every year by a monsoon and flood cycle which has become more severe due to changes in sea level and climate changes. Fourth, both water quality and quantity are at risk due to land-use changes, deforestation, and polluted waters both locally and across national borders. TERI has found that per capita water availability in India has declined from 6,000 cubic meters per year to 2,300 cubic meters per year in only fifty years. Finally, deforestation (due to agricultural expansion and trade in forestry products) is yet another challenge for South Asia and other developing regions. Over the last fifty years, forest cover in India has dwindled to less than fifty percent, and forest lands have been diverted to settlements, agriculture, and industry.

Before moving on to solutions, Pachauri argued the importance of understanding poverty as more than merely a lack of income. Poverty is people's lack of ability to retain control over their living conditions. Thus, if a community (whether rural or urban) lacks empowerment to live in a way that is sustainable, poverty results. Other conditions (such as a lack of property rights, unsustainable resource exploitation, lack of entitlements, restricted or denied access to resources such as fuel, the impact of science and technology, global economic factors, and national economic policies) serve to strengthen the cycle between environmental degradation (both immediate and long term) and poverty.
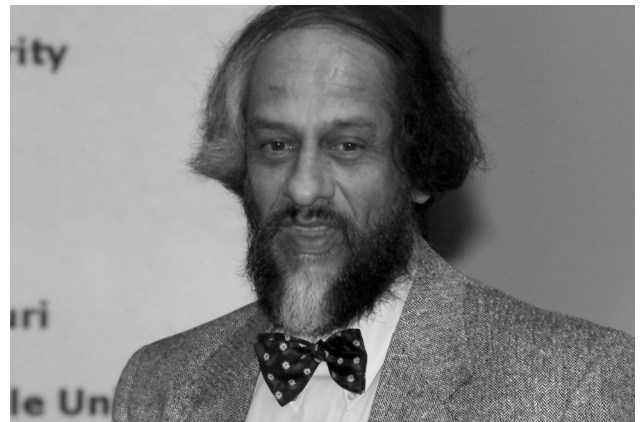
Solutions

So what can the world do to combat this situation? Pachauri identified six concrete actions that must be undertaken. First, access to resources must be addressed through ensuring entitlements for the poor, building and

sustaining capacity, ensuring the property rights of the community over commons, creating market access, and creating rural enterprises and jobs. Second, governance must focus on participation, the capacity and ability to address crises, and the building of political, economic, and social infrastructure. (Pachuari argued that even the developed world is weak in this area, particularly with regard to the central role of energy.) Third, property rights must be redefined with regard to common resources. Fourth, the world must reorient the development and use of science and technology. Fifth, national economic policies in their current status are insufficient because they do not ensure equitable growth or internalize environmental costs (for instance, national income accounts do not count the cost of environmental degradation). In addition, regulatory bodies are weak or non-existent, and centralized policies benefit only a small proportion of the population. Finally, Dr. Pachauri suggested that global economic policymakers should make more effort (a) to promote traditional product markets, (b) to push development assistance agencies for a greater stress on poverty reduction, and (c) to address climate change through economic measures.

As discussant, Ambassador Richard Benedick emphasized that these environmental security issues are global problems that require global solutions. He stressed the importance of Pachauri's focus on governance as well as science and technology in the crafting of solutions. Most importantly, Benedick reiterated that solving poverty and the resulting environmental degradation requires more than just money. Developed countries are just as responsible for ensuring the sustainability of not only the North but of the South.

Attendees discussed the importance of population growth and migration, the growth of civil society, and the too-often-ignored impact of overconsumption in rich countries. There was agreement that, while there are many potential synergies for global, regional, and national goals, too much focus often goes into international

R. K. Pachauri

agreements that are too weak and lack any real authority because their signatories fear loss of sovereignty. Another critical factor blocking resolution of many of these issues is the short-term focus of both politicians and the private sector at the expense of equitable, long-term solutions.

Pop-Enviro Web Gateway from Johns Hopkins University

The Johns Hopkins University Population Information Program has a new Web site that links users to population-environment resources. The site features: articles on population-environment issues from *Population Reports*, Johns Hopkins' quarterly journal; reports from Johns Hopkins Center for Communication Projects population-environment projects in Ecuador and Indonesia; a databank of population-environment photos, videos, posters, and other visuals; and links to other Web sites, listservs, and organizations. The site also allows users to do POPLINK searches for population-environment abstracts and to order CD-ROMs of *Population Reports* special issue "Population and the Environment: The Global Challenge." Visit the site at http://www.jhuccp.org/popenviro/.

31 October 2000

Transboundary Biosphere Conservation, Development and Peace-Building: Lessons from the Altai Mountains

*Featuring **Gila Altmann**, Parliamentarian State Secretary, German Federal Ministry for Environment, Nature Conservation and Nuclear Safety; **Hardy Vogtmann**, President, German Federal Agency for Nature Protection; and **Robin Mearns**, Senior Natural Resource Management specialist, The World Bank.*

The Altai Mountain range—an ethnically diverse area of over 37 million acres that straddles the borders of Russia, Mongolia, China and Kazakhstan—has been named one of the world's most significant areas of biodiversity by the World Wildlife Fund. But protected portions of this region suffer from the tension there between environmental and economic goals. Because it is difficult for residents of the Altais to fashion sustainable livelihoods, their societies have little capacity for environmental protection. As a result, some of the important large animals of the Altai range are now threatened with extinction.

Gila Altmann of the German Federal Ministry for Environment, Nature Conservation, and Nuclear Safety and Dr. **Hardy Vogtmann**, president of the German Federal Agency for Nature Protection, outlined an evolving international effort to facilitate transboundary conservation management in the Altais. The initiative is being watched closely and could serve as a conservation and peacemaking model for other areas around the world.

Toward a Sustainable Development Policy

Two areas in the Altai range had already been designated UNESCO natural heritage sites. But economic growth and industrialization in the region have clashed with local sustainable development initiatives. In response, the four countries of the Altais in September 1998 signed a "Protocol of Intentions" to work towards an "Altai Convention for Sustainable Development," which among other measures would declare the entire area a UNESCO biosphere reserve. The Convention is intended as a first step towards a coordinated policy for sustainable and culturally-sensitive development of the region.

Initiated by the Russian government as a joint German-Russian cooperative nature protection effort, this endeavor to promote sustainable and culturally sensitive development in the Altais is also designed to strengthen and promote conflict prevention by setting a collaborative precedent. As Altmann put it, "a successful environmental protection policy is peace policy."

Both Altmann and Vogtmann are senior German officials who are intimately involved in the Altai project. They stressed that Germany is playing a facilitator role in creating multilateral institutions in the Altais while remaining cognizant of the challenges of applying sustainable development models from the West. (German interest in this area stems in part from the sizable ethnic German population now residing there, the result of forced migrations early in the 20th century.) Altmann and Vogtmann said they remain at the beginning stages of their efforts, however, and were making their presentation to gather feedback and formulate partnerships. They requested assistance from meeting participants in the design, implementation, and funding of this emerging multilateral biosphere conservation effort.

Caution About Conservation Efforts

Robin Mearns, senior natural resource management specialist at the World Bank, highlighted his keys for any conservation effort in the Altai region. Mearns said that it is unrealistic to hope that the region will return to an earlier form of pastoralism, and that any conservation effort must take into account economic reforms that are changing the livelihood context for local inhabitants.

Mearns also emphasized the importance of distinguishing between policy and policy-in-practice in the Altais, saying that on-the-ground reality may differ greatly from what formal regulations dictate. He also cautioned against always associating conservation with peace. Mearns said he could envision some situations in the Altai region where exchanging present land-use patterns for conservation patterns could exacerbate rather than ameliorate conflict. Rhetoric about "peace parks," he noted, is often unpopular with local populations when it is not accompanied by an emphasis on tourism within a larger sustainable development framework. **W**

Cosponsored by the Environmental Change and Security Project and the Heinrich Böll Foundation

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SOMETHING NEW UNDER THE SUN: AN ENVIRONMENTAL HISTORY OF THE TWENTIETH-CENTURY WORLD

*Featuring **John R. McNeill**, Professor of History, Georgetown University.*

"The ecological peculiarity of the twentieth century" is the subject of **John R. McNeill**'s new book, *Something New Under the Sun: An Environmental History of the Twentieth-Century World*. McNeill discussed the book (which he began writing as a Wilson Center fellow in 1996-1997) at a November meeting sponsored by the Environmental Change and Security Project.

McNeill asserted that the period encompassing the 1890s through the 1990s has seen some of the most striking environmental events in history: a four-fold increase in world population; 13-fold increases in both world urban population and sulfur dioxide emissions; and a 17-fold increase in carbon dioxide emission. *Something New Under the Sun* explores the impact of these events on the earth's four different environmental spheres (atmosphere, hydrosphere, lithosphere, and biosphere).

McNeill said that the greatest intellectual challenge of the project was explaining both why these environmental changes happened and why they happened when they did. The most obvious causes, he said, are: (a) population explosion; (b) the broad conversion to fossil fuels in the energy sector; (c) the evolution of the world's economy; (d) the different types of technologies that carry their own environmental dangers; and (e) (very importantly) ideas and politics.

These six broad categories "co-evolved" because they were compatible with the socio-economic climate of the century, and their synergy led to drastic environmental changes. McNeill focused on the impacts of population and politics. Population, he said, was "one of the most important driving forces behind modern environmental change." The environmental impact of global population's increase from 1.5 billion to 6 billion has been exacerbated by both urbanization and migration. According to McNeill, environmental policy, throughout the twentieth-century, was an "accidental byproduct of other policies."

Something New Under the Sun will be included as a volume of The Global Century Series (edited by Paul Kennedy) from W.W. Norton. It will be the first volume on the environment for the Series. **W**

Remote Sensing and Environmental Treaties: Building More Effective Linkages
Report of a Workshop

Sponsored by the Socioeconomic Data and Applications Center, Center for International Earth Science Information Network (CIESIN), Columbia University

A final report is now available for this workshop, held at the Woodrow Wilson International Center for Scholars on December 4-5, 2000 in association with the Wilson Center, the Environmental Change and Security Project, IUCN-The World Conservation Union, and MEDIAS-FRANCE.

The workshop highlighted the potential for enhancing the effectiveness of multilateral environmental agreements (MEAs) through the appropriate application of remote sensing data and technology is now available. Sixty-eight professionals from the remote sensing community and MEA constituencies—including environmental NGO representatives, environmental lawyers, political scientists, and officials of the US State Department—met for two days of lively discussion. Among other conclusions, the group reached consensus recommendations on the need for: (a) a coordinated suite of environmental monitoring instruments; (b) coordinated institutional arrangements among space agencies, value-added companies, and MEA constituencies; and (c) education for MEA constituencies about the capabilities of current and future remote sensing instruments.

The report is an excellent introduction to the advances and challenges provided to MEA constituencies by remote sensing data and technologies. To receive the report, please contact Ed Ortiz of CIESIN at eortiz@ciesin.columbia.edu. Please also visit the workshop's Web site at http://sedac.ciesin.columbia.edu/rs-treaties for additional information.

16-17 November 2000

GLOBALIZATION AND ECOLOGICAL SECURITY: THE NEXT TWENTY YEARS

More than twenty years ago, U.S. President Jimmy Carter ordered a major review of long-range planning within the U.S. government. The resulting *Global 2000 Report* painted a picture of poor coordination and mutually exclusive predictions about future trends among different government agencies and departments. The report also brought together a number of environmental, technological, demographic, and economic forecasts for the state of the world in the year 2000.

"Globalization and Ecological Security: The New Twenty Years," a conference held at both the University of Maryland and the Woodrow Wilson Center, analyzed the process and predictions of *Global 2000 Report* in an effort to emphasize the need for continued and increased coordination among U.S. government departments. The conference also offered a rare opportunity to look ahead systematically another twenty years in the same critical areas addressed by the *Report*.

Wilson Center Flum Scholar **David Rejeski** established a framework for the conference with a presentation on how workers in institutions need peripheral vision. Rejeski detailed the many bureaucratic disincentives and educational traditions that prevent us from taking views that are wider than our department or profession. Citing examples of under-appreciated technology in the areas of microprocessors, genetics, sensors, and manufacturing, Rejeski demonstrated how the widespread inability to know and understand developments in other sectors will necessarily limit civil society and policymakers to reactive, after-the-fact responses.

The necessity for peripheral vision dominated subsequent discussions. Panelists discussed the major factors that in the next twenty years will impact population growth, migration, population "graying," health, energy use, climate change, globalization, and institutions. **Gerry Barney**, the lead author of the *Global 2000 Report*, remarked during the conference that it had been 19 years since he had addressed an audience honestly interested in how long-range planning affected environmental processes. However, there was little optimism among participants that coordinated planning and modeling had improved or would improve greatly in the coming twenty years. **W**

Conference Program:

Taking Stock: From Limits to Growth to Ecological Insecurity
   Dennis Pirages, University of Maryland
   David Rejeski, Woodrow Wilson Center
   Gerry Barney, Millennium Institute

Demographic Change
   Geoffrey Dabelko, Woodrow Wilson Center
   Amy Coen, Population Action International
   Chet Cooper, Pacific Northwest Laboratory
   Martin Heisler, University of Maryland

Luncheon Address
   Herman Daly, University of Maryland

Future Energy Sources and Global Warming
   Paul Runci, University of Maryland
   Matthias Ruth, University of Maryland
   Barry Worthington, United States Energy Agency

Technology and Alternative Energy Sources
   Kenneth Hunter, University of Maryland
   Graham Molitor, Public Policy Forecasting
   Robert Olson, Institute for Alternative Futures
   Eldon Boes, National Renewable Energy Laboratory

Water, Food, and Biodiversity
   Theresa DeGeest, University of Maryland
   Marc Cohen, International Food Policy Research Institute
   David Inouye, University of Maryland
   Olav Slaymaker, University of British Columbia

Disease and Microsecurity
   Jordan Kassalow, Council on Foreign Relations
   Stephen Morse, Columbia University

Cosponsored by the Environmental Change and Security Project, the Harrison Program on the Future Global Agenda at the University of Maryland, and the University of British Columbia.

Michael Moodie, Chemical and Biological Arms
Control Institute
Andrew Price Smith, University of North Dakota
Robert Sprinkle, University of Maryland
Sarah Glasgow, University of Maryland

Luncheon Addresses
Stephen Morse, Columbia University
Norman P. Neureiter, Department of State

**Global Environmental Governance—Multilateral or
Unilateral**?
Pamela Doughman, University of Maryland
David Hunter, Center for International Environmental
Law
Hilary French, Worldwatch Institute
Jacob Park, University of Maryland

**Innovative Responses to Global Environmental
Governance**
Geoffrey D. Dabelko, Woodrow Wilson Center
Margaret Keck, Johns Hopkins University / Woodrow
Wilson Center
Frances Seymour, World Resources Institute
Virginia Haufler, University of Maryland
Mark Zacher, University of British Columbia

MIGRATION AND THE ENVIRONMENT IN DEVELOPING COUNTRIES

*Featuring **Richard Bilsborrow**, Research Professor, Department of Biostatistics, Carolina Population Center*

Dr. **Richard Bilsborrow** of the Carolina Population Center presented the findings and conclusions of his most recent research—a survey (commissioned by the University of Michigan) of population and human migration trends. Unlike most such research (which has dealt with rural-to-urban migration), Bilsborrow's new work primarily examines *rural-to-rural* migration in areas ranging from South America to Southeast Asia. The work focuses on (a) the environmental factors that contribute to human migration from one rural location to another, and (b) the effects of this migration on the receiving areas' environment.

Rural Migration and the Environment

Bilsborrow reminded those gathered that, while rural populations are growing at a slower overall rate than urban populations, they are growing nonetheless, particularly in the developing world. This growth will continue to place pressure on rural resources. And even in regions that are experiencing negative population growth, the environmental consequences of migration are often high. While the total population of Brazil's Amazon region is down, for example, the effect of the rural migration that follows logging operations in the area is having a devastating effect on primary forestland.

By synthesizing his own research on rural-to-rural migration with the research of others, Bilsborrow is formulating a theory to measure the role of environmental factors in the decision to migrate. He has already determined that, while economics often drive rural-to-rural migration, environmental factors do come into play for household and communities making the decision to move. Families and communities usually decide to migrate only after attempts at agricultural intensification have failed or the available land has proven too small to feed a growing family size. The resultant extensification of the agricultural frontier is migration's greatest environmental effect—an effect that has been documented from Latin America to Southeast Asia (where expansion of agricultural lands has led to forest loss). One striking example, said Bilsborrow, is the case of Indonesia, where the official government supported rural-to-rural transmigration that led to the destruction of 60 percent of that country's forests.

Bilsborrow then went on to discuss two particular case studies: Guatemala and the Ecuadorian Amazon. In Guatemala, a rapidly declining mortality rate and a steady fertility rate led to a high concentration of family members on family lands and an eventual fragmentation of landholdings. An examination of census data revealed that this fragmentation subsequently spurred out-migration to other rural areas (especially to Guatemala's highlands), where new land was then exploited for agricultural use.

In the Ecuador case that Bilsborrow examined, all of the original migrants into one region of the Amazon region had been granted legal land title. At the time of the first survey in 1990, 419 families were settled on individual plots in an area which remained 59 percent forested. By 1999, however, the population had approximately doubled, average land plot size had halved due to subdivision, and the settlers had removed the majority of primary forest cover to make way for agricultural crops.

These examples make clear that rural-to-rural migration has a very definite impact on the environment of the receiving area. Bilsborrow concluded, however, that a great deal more research is necessary (in areas of departure as well as destination) in order to understand the matrix of factors driving such migration. **W**

Remote Sensing and Environmental Treaties: Building More Effective Linkages

*Featuring **Roberta Balstad Miller**, Center for International Earth Science Information Network (CIESIN), Columbia University; **Oran Young**, Institute on International Environmental Governance, Dartmouth College; **Jean Meyer-Roux**, Space Applications Institute, Joint Research Centre, Italy; **Robert Harriss**, Environmental and Social Impacts Group, U.S. National Center for Atmospheric Research; **Gerard Begni**, MEDIAS France; **Anthony Janetos**, World Resources Institute; **Susan Subak**, Office of Atmospheric Programs, U.S. Environmental Protection Agency; **David Sandalow**, Assistant Secretary for Oceans, Environment and Science, U.S. Department of State; **Marc Levy**, CIESIN; **Jack Estes**, Remote Sensing Research Unit, UC-Santa Barbara; **John Townshend**, Global Land Cover Facility, University of Maryland; and **Kal Raustiala**, University of California-Los Angeles Law School*

The tremendous proliferation of multilateral environmental agreements (MEAs) over the past 20 years has resulted in over 240 multilateral treaties that cover scores of environmental issues—and more global and regional agreements are on the drawing board.

But to achieve their purpose, these treaties require precise and accurate information about environmental conditions. Remote-sensing technology may allow for dramatically improved monitoring of those conditions as well as have great impact on many other areas of foreign policy. Sixty-eight professionals from the remote sensing community and MEA constituencies met for two days at The Wilson Center to discuss enhancing the effectiveness of MEAs through the appropriate application of remote sensing data and technology.

Conclusions

Workshop participants came to a number of conclusions regarding the current potential of remote sensing in relation to MEAs:

- **Remote sensing creates demand for better environmental law.** Remote sensing yields information that conveys environmental changes in a visually compelling way. As a result, it is extremely useful for raising awareness and developing the political support necessary to strengthen MEAs and environmental laws at the national level.
- **Remote-sensing data provide a synoptic view of many environmental trends.** Remotely-sensed imagery can provide both snapshots and data over time that address environmental issues at global, regional, and national scales. It can provide these in consistent formats and in ways that complement national-level data collection efforts, which often lack full resources and are inconsistent from country to country.

- **Remote sensing can contribute to global assessments in support of MEAs.** Remote sensing provides timely information on a large and growing number of environmental issues (such as land-use/land-cover change, carbon-monoxide plumes, and the carbon density of ecosystems) that can significantly contribute to global environmental assessments in support of MEAs (such as the Intergovernmental Panel on Climate Change and the Millennium Ecosystem Assessment).

- **At present, remote sensing is not likely to contribute to compliance verification.** In the short term, remote-sensing data are unlikely to play a significant role in MEA compliance verification for three principal reasons:

1. Sovereignty concerns have generally taken precedence over enforcement of treaty provisions, and therefore contracting parties are unlikely to accept external verification. This may change as environmental issues grow in salience.
2. Many treaty-specific remote-sensing applications are still experimental; these applications will need to

be further refined before they will have the credibility necessary for use in compliance verification.

3. Issues such as guaranteed access to data by all parties, documentation of methodologies, and long-term data archiving have yet to be addressed.

Recommendations

Workshop participants also made a number of recommendations:

- **Remote-sensing instruments.** There is a need to develop a coordinated suite of environmental monitoring instruments with long-term data continuity at appropriate spatial, spectral, and temporal resolutions. Some satellites (such as Landsat) already provide crucial data, and the continuity of the program needs to be maintained. Data archiving services should be developed in parallel. For MEA applications to become operational, the price of land-based remote-sensing data would need to more closely approximate that of meteorological data, which have traditionally been available at low cost on an open-access basis.

- **Institutional arrangements.** An international institution should be mobilized to promote coordination at three levels: among space agencies, among space agencies and value-added companies, and among these two groups and MEA constituencies. An existing institution—such as the Committee on Earth Observation Satellites (CEOS) or the Integrated Global Observing Strategy (IGOS)—may be able to fill this role. This institution would also serve as a focal point for the development of the next generation of operational satellite systems. Given that the costs of such a system are likely to be beyond the means of any single country, a cooperative approach would serve to spread the costs among multiple providers.

- **Awareness raising and training.** MEAs constituencies—including secretariats and contracting parties—need to be educated about the capabilities of current and future remote-sensing instruments. They also need to receive training and capacity building in the use of remote sensing data for environmental monitoring.

Participants agreed that the workshop represented the first step in a dialogue between the remote-sensing community and MEA constituencies, and that further exchanges are needed. CIESIN pledged to foster that

dialogue through a new Web site at http://sedac.ciesin.columbia.edu/rs-treaties. In response to participants' recommendations, CIESIN will also summarize case studies of treaty-specific remote sensing applications that can serve as a "state-of-the-art" in the field; it will also consult with convention secretariats about their remote-sensing data needs. W

Related Web Links

CIESIN: Remote Sensing and Environmental Treaties Workshop
http://sedac.ciesin.columbia.edu/rs-treaties

The World Conservation Union
http://www.iucn.org/

MEDIAS (France)
http://medias.meteo.fr/www/anglais/reseau/

Space Applications Institute
http://www.sai.jrc.it/home_mission.htm

Environmental and Social Impacts Group, National Center for Atmospheric Research
http://www.ncar.ucar.edu/ncar/esig.html

World Resources Institute
http://www.wri.org/wri/

U.S. EPA: Office of Environmental Protection Agency
http://www.epa.gov/oar/oap.html

U.S. Department of State: Spotlight on Climate Change
http://www.state.gov/www/global/global_issues/climate/index.html

University of Maryland: Global Land Cover Facility
http://glcf.umiacs.umd.edu/

THE CRAZY AUNT IN THE BASEMENT: WHY THE FAMILY PLANNING MOVEMENT SHOULDN'T BE AFRAID OF ITS HISTORY

*Featuring **Matthew Connelly**, Faculty Fellow, Institute for the Humanities and Assistant Professor, Department of History, Gerald R. Ford School of Public Policy, University of Michigan*

While the modern family planning movement has a checkered past, the history of a movement is not necessarily its destiny. In a presentation that looked at both the positive and negative roots of the family planning movement, **Matthew Connelly** argued that we cannot discredit a 20th century movement because of its past distortions or simply because it was founded on 19th century values. Rather, Connelly said, we must examine that history and learn from it.

The Uses of Population

Connelly began by noting that both population and its reduction have been used throughout the last century as platforms for a variety of political projects. Even the eugenics movement—commonly seen today as automatically negative—has in some contexts had more positive aspects and consequences. In the United States and Germany, this movement was indeed primarily negative in character and used to justify the oppression of certain sectors of society. But in France and certain areas of Latin America, eugenics took on a more pro-natal aspect, and was used as a political argument to support greater investment in social systems and state-sponsored health programs.

Connelly also cited the anti-colonial movement in India for its intriguing use of the population issue. Indian independence activists turned the population growth question on its head by asserting that the problem was not too much Indian population growth but instead the worldwide expansion of white colonial populations (which these activists termed the "white peril"). While Indian leaders also wanted to reduce population growth, Connelly noted that they made the issue explicitly one of Indian welfare. They linked high rates of population growth to high levels of poverty and child and infant mortality as well as to the lack of education available to women. In this formulation, reducing poverty was seen as the way to slow population growth. Colonialism was blamed for the existence of these conditions, and so promoting family planning became a way to critique the colonial structure.

The Focus Shifts to Health

According to Connelly, population growth was seen by 1950 to be a serious international concern. Theories of economic development focused on the necessity for countries to undergo *demographic transition* (moving from a state of high birth rates and high death rates through a period of high birth and falling death rates to a situation of low birth and low death rates) in order to progress to a new stage of development. Contraceptives were seen as the essential quick fix to facilitate this transition in poor rural areas. As a result, the focus of family planning became contraceptive distribution and growth rate control. In many cases, individual rights became less important than the overall societal need for progress and transition.

But by the end of the 1960s, Connelly said, this paradigm came into question. With the less-than-overwhelming success of many contraceptive programs and a few highly publicized cases of coercive family planning measures, the focus for population advocates once again began to shift toward female and child health. This shift was firmly in place by the time of the International Conference on Population and Development held in Cairo in 1994. According to Connelly, the family planning movement today has three priorities: (a) the welfare of mother and child, (b) individual choice about reproduction, and (c) poverty reduction through family-size reduction.

A Return to Positive Roots

Connelly concluded by pointing out that, in contrast to the usual perception of the term, "population control" could be seen as a form of freedom. Population policies, he said, have always had the potential to be used for both good and evil ends. However, a look through a historical lens at family planning reveals that the movement has indeed come full circle. Instead of recapitulating its darker chapters, Connelly said, family planning has returned to its more positive roots by emphasizing improved infant health, women's liberation, and individual choice. **W**

THE CHERNOBYL SHUTDOWN:
END OR CONTINUATION OF AN ERA?

*Featuring **Vladimir Belskiy**, Counselor, Embassy of Russia; **Alexsandr Khmurets**, Counselor, Embassy of Belarus; and **Sergii Korsunskyi**, Counselor, Embassy of Ukraine.*

The last working reactor at the Chernobyl nuclear power complex in Ukraine was closed on 15 December 2000, over fourteen years after an explosion at the plant's Number Four reactor turned into the world's worst civilian nuclear disaster. But the consequences of that explosion and its aftermath continue to grow, and the possibility of fresh radiation leaks still threatens the region. Consular officers from Russia, Ukraine, and Belarus met with an audience at the Woodrow Wilson Center to discuss how their countries are dealing with Chernobyl's ongoing impact.

A "Grave Symbol"

Sergii Korsunskyi, counselor for Ukraine's Embassy to the United States, opened the meeting by calling Chernobyl "one of the grave symbols in the modern history of Ukraine." He recounted the human costs of the disaster for Ukrainians: 3.5 million victims (1.26 million of whom are children); 160,000 displaced persons; and thousands of deaths. Korsunskyi said that one in every 16 health disorders in Ukraine can be attributed to the effects of Chernobyl; that thyroid cancer there is 15 times what it was before the accident; and that the worst health effects are yet to come. The Chernobyl complex is also encircled by a 20-mile-radius "no-go" zone of contamination that is spreading to the west and that will eventually prompt the evacuation of other towns.

Korsunskyi added that the closing of Chernobyl's last reactor will cost 5,000 workers their jobs and Ukraine 5 percent of its electricity production, posing a new set of challenges for the country.

Russia More Concerned with Nuclear Safety, but Determined to Use Nuclear Power

Vladimir Belskiy, counselor for Russia's Embassy to the United States, related how unexpected the Chernobyl accident was in the Soviet Union's corridors of power as well as how inadequately prepared the entire country (from firemen to local authorities to high government officials) was for such an event. The aftermath and subsequent public outcry, said Belskiy, spurred the era of *glasnost*.

But the biggest consequence of Chernobyl for Russia has been the persistence and institutionalization of safety concerns about the country's nuclear industry. Belskiy stated that the Russian State Ministry for Atomic Energy now is constrained by a system of checks and balances—its officials must now appear before the Duma and even in court to defend their practices and priorities. Belskiy also credited the vigorous Russian environmental movement for serving as a watchdog over the nation's nuclear activities. Despite the fact that 11 reactors of Chernobyl's architecture are still online worldwide, he asserted that Russia is doing everything it can to assure nuclear safety and is seeking international cooperation to this end.

Belskiy concluded, however, by stating that Russia (echoing the call of Andrei Sakharov) would continue expanding its nuclear power program. Ten percent of Russia's electricity is now generated by nuclear plants, with 10 such plants now online and another to open in February. A new generation of safer plants (whose waste will not be adaptable to military uses) is planned for Siberia, the northern Caucasus, and the eastern Asian region. Russia's goal is to have nuclear power producing approximately 20 percent of its electricity within two decades. Belskiy added that Russia also plans to build in the near future two nuclear reactors each in India, China, and Iran.

A Continued "Devastating Impact" on Belarus' Health and Economy

Alexandr Khmurets, counselor for Belarus' Embassy to the United States, said that Chernobyl "continues to have a devastating impact on three countries," with the worst effects—health, economic, social, and environmental—to come. Seventy percent

of the radioactive fallout from Chernobyl fell on Belarus, contaminating 20 percent of its forests and immediately ruining 6,000 square kilometers of its agricultural land. One hundred-nine thousand Belorussians have been resettled. Two million people—a quarter of them children—have been directly affected. Thyroid cancer and disorders are occurring 100 times more than normal in some areas, and the rise in such cancers is not expected to peak until the year 2006. Still, as Khmurets bemoaned, "Chernobyl is now largely forgotten" by the international community.

Khmurets added that the perception of contamination has also had ruinous effects on the country's ability to create wealth. While Belarus "used to feed Russia," it now must import everything. Even its safe food products and timber—the latter once the equivalent of hard currency in the region—are now impossible to market. A massive budget deficit has sprung up in an attempt to counteract the economic shortfalls, and Belarus spends 20 percent of its budget simply to alleviate suffering from Chernobyl and mitigate its economic effects.

Meanwhile, 150,000 square kilometers of Belarus remain contaminated and effectively barren, with the long half-lives of the explosion's released isotopes ensuring that radioactivity will menace the area for most of this century. Khmurets also warned of the possibility of recontamination from a fresh Chernobyl breach. A flood of the plain surrounding the complex could poison the main water supply for millions; the burial sites for waste are not as deep as they need to be; and forest fires threaten to release radioactive materials into huge clouds of smoke.

"The relatively small death tolls and lack of grotesque deformities have fooled people about the immeasurable toll of the disaster," Khmurets concluded. "The area stood a chance to emerge as an optimistic and progressive region after the fall of the Soviet Union, but Chernobyl destroyed this hope." He appealed for international aid and investment in Belarus, saying that its infrastructure was intact and populace well-educated and eager to become self-sufficient.

Aid Options for the International Community

The audience questioned the three officials on what role the international community should play in the Chernobyl cleanup as well as on the area's current nuclear activities. Belskiy stated that Russia has undertaken measures of "supercontrol" and modernization vis-à-vis the 11 remaining Chernobyl-like reactors, and that it expects these reactors to operate safely for at least 10 to 15 more years. He added that all nuclear activities in Russia are now done in accordance with international norms and standards, and that the International Atomic Energy Agency (IAEA) now supervises all Russian nuclear construction abroad for nonproliferation and safety. Russia also has a long-term project for reprocessing other countries' nuclear waste under consideration; while many Russian green movements have criticized the plan, Belskiy said that it is likely to be approved.

Korsunskyi said that another Chernobyl would mean "the end of Ukraine," and that the two new nuclear plants under construction in Ukraine (as well as the reprocessing plant being built at the Chernobyl site) are proceeding under the strictest international safety guidelines. While the present Ukrainian contamination is beyond repair, $750 million in international funds is being used to shore up the sarcophagus of Chernobyl to prevent further contamination. Korsunskyi stressed that one of Ukraine's biggest needs is foreign investment to generate both jobs and the production of clean food and water. Belskiy added that fewer state and more private initiatives are needed for the rehabilitation of the region's people, natural resources, and economy.

Khmurets said that last year's reprocessing plant accident in Japan should prove to the world that nuclear accidents can happen in developed countries as well as developing ones. He said that the best way to help people in contaminated areas would be to speed up the region's structural economic reforms, and he assured donors that any international aid to Belarus would be kept under the control of international officials. **W**

EXPLORING THE LINKS BETWEEN GLOBAL ENVIRONMENTAL CHANGE AND HUMAN SECURITY AND POPULATION: A MEETING IN THE *AVISO* POLICY BRIEFING SERIES

*Featuring **Betsy Hartmann**, Director, Population and Development Program, Hampshire College in Amherst, MA; and **Alex de Sherbinin**, Research Associate, Columbia University's Center for International Earth Science Information Network (CIESIN)*

Conventional wisdom (and much U.S. policy toward the developing world) holds that rapid population growth is a major cause of poverty, human insecurity, and environmental degradation.

But the actual impact of large populations is much more complicated and uncertain. Human security turns out to be dependent on many different forces at many different levels—from U.S. environmental policy to single households in developing countries.

Betsy Hartmann and Alex de Sherbinin detailed their findings on this subject in a presentation of papers from the latest issue of *AVISO: An Information Bulletin on Global Environmental Change and Human Security*. While Hartmann challenged some of the overarching assumptions of current thought on population and the environment, de Sherbinin explained how grassroots efforts really can make a difference in building sustainable societies.

Toward a Broader Definition of Human Security

Betsy Hartmann said that simply blaming population growth for environmental risk and a low quality of life "blocks a deeper understanding of the obstacles to achieving human security and ultimately limits policy options." Other factors—such drastic disparities in consumption patterns, power, and income between the developed and the developing world—need to be considered.

"There is an overpopulation of cars," said Hartmann, "that is the main source of population distribution in the United States and a major factor in the degradation of the environment and quality of life here."

Hartmann cited the technology investment choices of developed countries (e.g., highways versus public transit, or missile-shield defense systems versus energy-saving technologies) as another threat to global sustainability. She also argued that environmental disaster often occurs where poor people—especially women—lack the means and freedom to invest in land improvement or diversify their livelihoods.

"We have a tendency to blame environmental degradation on poor peasants," Hartmann said. "But this ignores the larger forces at work, the specific property regimes. In the Amazon, it's mining and ranching interests who are destroying the hillsides."

Hartmann said that the last two decades have been a decisive era—not only for the decline of human security, but for the ways governments and nongovernmental organizations (NGOs) sought to reverse that decline. For example, she blamed the structural adjustment policies of the 80s and 90s for the defunding of African public health programs, which she said contributed to the subsequent inability of healthcare systems to cope with the AIDS epidemic there. "Access to decent health care, one of the most fundamental conditions for human security, was sacrificed on the altar of the free market," Hartmann said.

But during this same period, according to Hartmann, government and family planning officials also took an increasingly narrow approach towards population policy. The drive to reduce population growth led to a distortion of family planning programs: they became focused on meeting demographic targets instead of increasing access to birth control and meeting basic health needs. Fears of mandatory sterilization kept people in many developing countries away from clinics altogether.

Cairo and Beyond

Hartmann called the 1994 United Nations International Conference on Population and Development in Cairo "a great step forward" in population policy. But Cairo's implementation proved difficult because of a lack of funds and infrastructure, opposition from anti-abortion and fundamentalist forces, and a narrow empowerment agenda for women that gave short shrift to land and legal rights.

Now, according to Hartmann, U.S. President George W. Bush's restriction of government funds to any organization that provides abortion services or provides education about abortion overseas (known as the "global

gag rule") will further undermine women's health worldwide. "What the [political] right refuses to recognize," said Hartmann, "is that women have abortions whether they are legal or not. The question is whether they are safe, or whether women will die or suffer lifelong complications."

But Hartmann said she also fears another kind of gag rule—the failure of the population policy community to critique neo-Malthusian assumptions and coercive population control policies for fear of playing into the hands of conservatives. And she criticized how both the media and international family planning programs link overpopulation with famine and conflict. Hartmann cited several examples of these linkages—from a recent RAND Corporation report to covers of *The New York Times Magazine* and the *Atlantic Monthly*—in arguing the speciousness of this approach.

"The population community needs to resist the use of negative racial and gender stereotypes that prey on fears of these people in the U.S.," said Hartmann. "Blaming the poor for environmental degradation diverts attention from the U.S. role in global warming and the lack of a responsible U.S. environmental policy overseas." She said that a far more positive way to link population issues to human security would be to expand access to reproductive health resources as well as to work for human rights.

Population and Environment are Local

Alex de Sherbinin shifted the meeting's focus to local and household strategies in coping with environmental change. According to de Sherbinin, there are five different kinds of "livelihood assets": *natural capital* (both renewable and non-renewable); *social capital* (networks, relationships of trust, and access to wider institutions of society); *human capital* (skills, knowledge, abilities, and health); *physical capital* (transport, shelter, water, energy, communications, and production equipment); and *financial capital*.

De Sherbinin emphasized that these assets interact with institutions, culture, economics, and population dynamics to produce locally differentiated environmental processes and change. Utilizing photographs from South Asia to Africa to South America, he showed local livelihood images as well as NGO efforts at creating local sustainability.

New data presented by de Sherbinin from the Pilot Environmental Sustainability Index (ESI) also revealed interesting relationships among poverty, population growth, and environmental degradation. While low human development is associated with high total fertility rates and high human vulnerability, for example, no

correlation has yet been established between population growth and the condition of environmental systems. "Good governance and lack of corruption correlated highest with the best environmental quality," said de Sherbinin. (You can view the full ESI data set at http://www.ciesin.org/indicators/ESI/pilot_esi.html.)

Besty Hartmann

De Sherbinin then compared two cases (Haiti and the Machakos District of Kenya) in which increases in population density led to diametrically opposite results. The cycle of population growth and environmental decline in Haiti was caused by a legion of factors: poor governance, a feudal system that blocked the emergence of modern market dynamics, and predatory regimes that failed to respect human rights and disregarded civil society and NGOs.

The Machakos District succeeded because (among other reasons) local and national institutions encouraged not only community and private investment but access to markets and equitable land tenure. With such dynamics at work, population density contributed not only to an increased labor supply but also to lower interaction costs and more knowledge-related institutions.

Such comparisons teach valuable lessons to those interested in sustainable societies, argued de Sherbinin. National governments should promote good governance (ensuring civil liberties, democratic institutions, transparency, and land and resource rights) as well as sound physical infrastructure and human services. They also need to support women's empowerment and family planning programs that stress quality of care and male involvement. But the grassroots efforts of community-building organizations, NGOs, and individuals are equally important for

sustainability.

Misplaced Alarm?

Audience members questioned the radical de-emphasis of population growth as a factor in poverty and environmental degradation. Hartmann replied that "we need urban planning to manage demographic trends. Instead of making aggregate arguments, it's much more helpful to look at local situations. . .We need planning rather than panic."

Hartmann also stressed that much environmental degradation is a consequence of weak local institutions and deployment of inappropriate technologies. And she insisted that the alarm over population growth was misplaced. "There are plenty of other things to be alarmed about," Hartmann said. "It's hard to move away from alarm's proven track record, but we need to figure how we can be urgent about issues without blaming poor people."

Both Hartmann and de Sherbinin said that renewed attention on the developed world's consumption habits is overdue. "It's relatively straight forward how to get people off a high-consumption, high-technology lifestyle," said de Sherbinin. "It's more problematic to advance this option politically. We will start to face real tradeoffs eventually." W
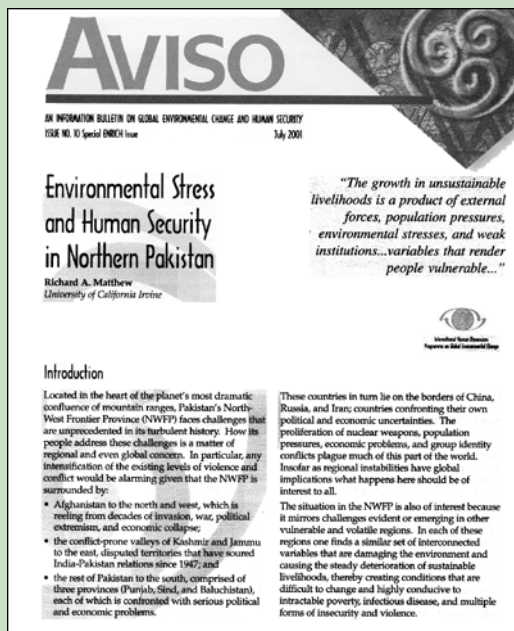
AVISO

AVISO is a series of information bulletins and policy briefings on various issues related to environment and human security. This publication series is a cooperative effort between the Global Environmental Change and Human Security (GECHS) project, the Woodrow Wilson International Center for Scholars, the U.S. Agency for International Development through a cooperative agreement with the University of Michigan, the Canadian International Development Agency, and the University of Victoria.

GECHS is a core project of the International Human Dimensions Programme on Global Environmental Change (IHDP). The main goal of the GECHS project is to advance interdisciplinary, international research and policy efforts in the area of human security and environmental change. The GECHS project promotes collaborative and participatory research, and encourages new methodological approaches.

Issues 1-8 have looked at topics as diverse as human security, population displacement, water scarcity, food security, southern visions of sustainable development, and population and infectious disease. *AVISO* is available in English, Spanish, and French. To see past issues, please visit the GECHS website at http://www.gechs.org, where copies may be downloaded in PDF format.

THE CHALLENGE OF ENDING RURAL POVERTY:
SPECIAL RELEASE AND DISCUSSION OF
THE NEW 2001 IFAD RURAL POVERTY REPORT

*Featuring **Fawzi H. Al-Sultan**, President, International Fund for Agricultural Development (IFAD); **George McGovern**, U.S. Ambassador to the United Nations Food and Agricultural Agencies; **John Mellor**, President, ABT Associates; **Geeta Rao Gupta**, President, International Center for Research on Women; **John Westley**, Vice-President, IFAD; **David Beckmann**, President, Bread for the World; **Peter McPherson**, President, Michigan State University; Co-Chair of the Partnership to Cut Hunger in Africa; and **Rajul Pandya Lorch**, Head of the 2020 Vision for Food, Agriculture and the Environment Initiative, International Food Policy Research Institute*

World attention needs to refocus on rural poverty and its critical importance to poverty in general, according to a new International Fund for Agricultural Development (IFAD) report released to the public at the Wilson Center. Nearly 150 people attended the report's release and a subsequent discussion, while many more watched via live Web cast. (The archived Web cast is available at http://ecsp.si.edu/ ruralpov.ram.)

Three-quarters of the 1.2 billion people in extreme poverty live in rural areas. *Rural Poverty Report 2001: The Challenge of Ending Rural Poverty* details their livelihoods, the factors that keep them impoverished, and the steps the world must take to help them. The rural poor are caught in a matrix of pernicious circumstances and forces: little access to schools, hospitals, markets, credit, and technology; dry and marginal lands; low levels of literacy; bigger families, higher mortality, and more hunger and disease (including HIV/AIDS); and fewer employment opportunities off the land.

In introducing the report, **Fawzi Al-Sultan** warned that today's rate of poverty reduction is less than a third of that needed to achieve the UN Millennium Summit's target of halving global poverty by the year 2015. He called for a reversal of the twelve-year decline in agricultural development aid given to developing countries, saying that "the rural poor must be the focus in any effort to eradicate poverty."

The IFAD report emphasizes four specific and critical needs of rural farmers: assets, markets, technology, and

Geeta Rao Gupta

institutions. Poor farmers own very little land and cannot use what they have for their own benefit, said Al-Sultan; they need more land and water access as well as more financial support and land titles. Local markets and infrastructure also need to be developed to give rural farmers' access to better prices. In addition, both existing and new technologies need to be brought to smallholder agriculture, and agricultural research needs to refocus on crops of use and importance to these farmers. Finally, institutions must become more responsive to and equitable for the rural poor.

Other rural residents especially vulnerable to poverty include landless wage laborers, displaced people, and female householders. Al-Sultan noted that impoverished rural women and children often suffer the most, having even less access to land, water, credit, and social services than their male counterparts.

Agricultural Reform Key to Poverty Eradication

George McGovern called the IFAD report a wonderful statement of the need to deal more strongly and effectively with rural poverty. The drive to halve global hunger and poverty by 2015 is "perfectly practical and achievable," said McGovern. "I am sure we can do this in 15 years."
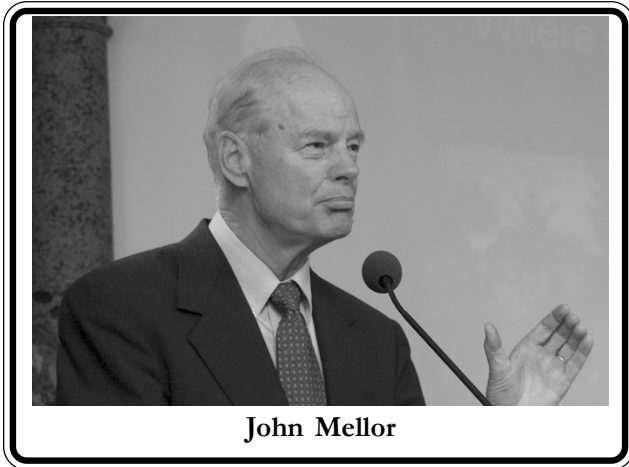
But he questioned whether donor and recipient governments have the interest or competence to use the resources now available to achieve the 2015 goal. To combat this inertia, McGovern called for a campaign

focused on the 300 million hungry children worldwide. Calling nutrition "the handmaiden of education," McGovern stressed that school lunch programs are the best weapon to promote education and hence increased literacy, better health, and lower birthrates. He also vowed to lobby President George W. Bush and U.S. Secretary

John Mellor

of State Colin Powell on the importance of the report and the unparalleled effectiveness of investing in girls' education.

John Mellor said that he was hopeful the IFAD report could spur foreign donors to return to their higher agricultural aid levels of the 1980s, which were extraordinarily successful in reducing rural poverty. While there is now much talk of the ascendancy of urban poverty, said Mellor, absolute urban poverty in Asian countries (for example) has essentially ceased to exist. Agricultural reform is the proven engine of poverty eradication, he stressed, not only because most poverty is rural but because of the profound multiplier effect of rising rural income: for every one agriculture job created, two to three are created in domestic goods and services.

The Importance of Empowering Women

Geeta Rao Gupta called the IFAD report both a great resource and a prime advocacy tool. But she warned that the UN Millennium Summit pledge cannot be met or sustained without significantly involving poor rural women in the effort. Such involvement is both smart and right, said Rao Gupta: smart because women are crucial players in food security, and right because gender disparities are greatest among the rural poor. "A gender perspective needs to be woven through all the analyses and recommendations of the IFAD report," she said.

Rao Gupta also noted that the UN Security Council's recent discussion of AIDS as a national security issue

afforded an opportunity to place food security on the international agenda as well. Citing the success of advocacy for girls' education, she argued that comprehensive national data on women's poverty would be crucial in convincing skeptical officials of the need for action.

Implementing the Report

Audience questions focused on implementing the report's conclusions and recommendations. Calling the issue of rural poverty as important as that of debt relief, Al-Sultan noted the difficulty of getting rural agricultural programs onto the agenda of developing countries' governments. But he also noted that, after a long period of budgetary restraint, some developed countries have a renewed interest in foreign development aid.

A full discussion period followed the report's presentation. **John Westley** of IFAD began by announcing that the report (which had been presented two days earlier to United Nations officials) would also be presented to several donor countries in the next weeks and then to aid recipient countries.

Asserting that agricultural aid has been neglected inadvertently in foreign aid budgets of the last decade, **Peter McPherson** called for an "NIH-like" professional approach to the problem of increasing agricultural productivity worldwide. McPherson said that U.S. Secretary of State Colin Powell is deeply interested in African affairs and will be receptive to such an approach. "The technological capabilities for food production are just exploding," said McPherson. "But if we continue our short-term view, more people will die."

David Beckmann announced that a recent Bread for the World survey showed that 83 percent of the American public wants the U.S. government to support the effort to halve global poverty by 2015—and is willing to pay $50/person annually to accomplish it. He said that $4 billion in additional and effective poverty reduction assistance ($1 billion more from the United States) would ensure reaching that goal, and he added that he is hopeful both the Bush administration as well as Senator Jesse Helms (R-NC) will be open to this initiative. "We need institutional reforms, too," said Beckmann, "but money is a clear sign of will to alleviate this problem."

Rajul Pandya Lorch called the IFAD report the clearest and most compelling report to date on rural poverty and how to eradicate it. However, she was pessimistic—given the intractability of global rural food insecurity—that the Millennium Summit goal could be reached. Pandya Lorch noted that food insecurity is

entrenched in Asia and has doubled in sub-Saharan Africa since the 1970s. She also cited urbanization, HIV/AIDS, and globalization as major developments that could block poverty eradication efforts.

"Looking for Openings"

Responding to audience questions, Beckmann said that the IFAD report's proposals were entirely consistent with President Bush's platform of "compassionate conservatism." And he defended his openness to working with Senator Helms, saying that Helms' staff members have told him the Senator wants to reform the U.S. Agency for International Development, not eliminate it. "I'm hopeful, not optimistic," said Beckmann. "We're looking for openings."

George McGovern echoed Beckmann's optimism and added that there has never been a better time to launch an effort to eradicate poverty. McGovern said that, while $16 billion in productivity is lost annually because of world hunger, $6-8 billion yearly would end it. "There is a real possibility that the kind of interesting common sense proposals heard today could be sold to the U.S. government and my UN colleagues," added McGovern.

All participants agreed with Pandya Lorch that, while foreign aid is welcome, the real goal is agricultural self-sufficiency for developing countries. She added that there must be a strong element of community participation from the beginning in any new program of agricultural assistance. Wesley of IFAD said that the report will be presented to aid-recipient countries precisely to generate such self-initiative. Beckmann concluded by lauding the IFAD report's case studies highlighting programs that increased productivity and political empowerment for the world's poor. He said that groups representing the

Peter McPherson

poor must push from below for poverty reduction strategies that are not business as usual. W

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U.S. POLICY AND THE GLOBAL ENVIRONMENT:
MEMOS TO THE PRESIDENT

*Featuring **John A. Riggs**, Executive Director, Program on Energy, the Environment, and the Economy, The Aspen Institute; **Donald Kennedy**, Bing Professor of Environmental Science, President Emeritus, Stanford University; editor-in-chief,* Science *magazine; and **Franklin C. Moore**, Acting Director, Center for Environment, U.S. Agency for International Development*

How should the Bush administration respond to critical global environmental problems? The Aspen Institute last summer asked prominent scientists and academics along with business leaders and environmental activists to formulate "memos to the president" on U.S. policy towards such linked issues as climate change, population, water, energy, and agriculture. The resultant book—"U.S. Policy and the Global Environment: Memos to the President—was presented at the Wilson Center by its co-editors John Riggs and Donald Kennedy (who is also on the advisory committee of the Environmental Change and Security Project). Franklin Moore of USAID served as discussant.

Franklin Moore

"We Share the Same Atmosphere"

Despite the fact that environmental issues and their solutions are indisputably global in scope, **Donald Kennedy** said the purpose of "Memos" was to get the attention of the next U.S. administration with an assessment "aimed very much at U.S. environmental policy." (The book is available in PDF form at www.aspeninstitute.org/eee/memos.html and was published in serial form in *Environment* magazine over the past year.)

Kennedy said that the Aspen Institute began the project with two assumptions: (1) global change—in climate, land cover, population growth, air quality, and water resources—is rapidly accelerating; and (2) while poverty, hunger, and inequitable income distribution are largely located in the developing world, a narrow definition of national interest will be ineffective in solving them.

But aren't these problems too large to attack as a set? No, said Kennedy: work on one will help with the others. He also argued that United States leadership is essential to this process. The United States can help, said Kennedy, both (a) because of its immense and transferable knowledge bank in technology and science, and (b) because it is in the U.S. national interest to take an interest in quality of life globally. "It's not just because we share the same atmosphere," said Kennedy. "We can't afford to see the developed world descend into a spiral of poverty and conflict that will eventually reach us."

Kennedy cited several papers in "Memos" as examples of the complexity and tradeoffs that the Bush administration will have to comprehend in order to effectively deal with transnational environmental and human security problems. He also warned that water is the next flashpoint issue in many regions; 70 percent of the world's major rivers have international watersheds, providing "tinder for conflict." Kennedy concluded by calling for a rigorous international governmental regime to be established for dealing with these problems.

Cosponsored by the Environmental Change and Security Project and The Aspen Institute

The Importance of Civil Society

Franklin Moore called "Memos" a "very useful capsulation of why the environment is important to the United States, to its foreign policy, and to sustainable development" in general. He said that the book strikes an important balance between the moral necessity of dealing with environmental issues and the necessity of seeing these issues as essential to national security.

And Moore lauded several articles in the book that touch on the increasingly important role of civil society in global environmental governance. "There is a real concern about subjecting governments to additional costs for these issues," he said. "It is really civil society that leads and must lead the way." He also cited the overwhelming demand by Home Depot consumers for lumber from certifiably sustained forests as an example of the public driving corporations towards environmental consciousness. "They can't keep enough of the stuff in stock," said Moore.
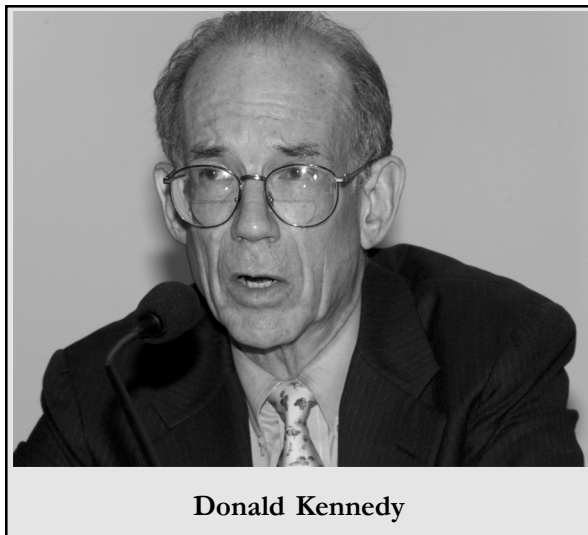

Donald Kennedy

However, Moore noted that "Memos" fails to address "depletion of the earth" (soil depletion and desertification), which he called one of the four fundamental global environmental issues. And he argued that, while overseas development aid has a critical role in sustainable development, the proper mix of such aid with trade, investment, and domestic sources of finance remains unclear. "We have only been in the development aid business for 55 years," Moore said. "Before that, every nation developed through trade and foreign investment."

The Political Climate for Sustainability

Topics for audience questions ranged from international standards for sustainable production to the soundness of the science behind claims of climatic change. While Kennedy supported international sustainability standards, Moore said his negotiating experience has taught him that such standards gravitate to the lowest common denominator and are often irrelevant to developed countries. He argued instead for respecting local and regional conditions in the formulation of global policy. "This should be done on a forest-by-forest basis,"

Moore said. **John Riggs** added that alternative standards set by nongovernmental organizations and civil society have (with public effort) become effective consumer and investor guides.

Kennedy said that the Bush administration would not be particularly receptive to "Memos" right now, in part because the book is based in science and so many of the administration's senior science positions remain unfilled. Moore added that the upcoming 2002 Rio +10 conference in Johannesburg presented a variety of opportunities for environmental advocates. However, Moore cautioned that it would be crucial for these advocates not to see the world as simply divided into developed and developing countries. Rather, large economies with large industrial components (such as China, India, and Brazil) as well as small island nations and poor countries all have different responses to the significance of overseas development assistance, trade, investment, and the environment. Recognition of this, said Moore, would productively alter the Rio dialogue and allow new solutions to come forward on critical problems.

"The UN also doesn't give enough credibility to local governments as a group," Moore added. "With localities represented, you would get a very different discussion of urban and environmental issues."

"The Genome I Want To See Is Rice"

In response to a question about the scientific consensus expressed in "Memos," Kennedy said that, while the science on the importance of such issues as global warming, biodiversity, population, and environment and conflict is overwhelmingly convincing, this science needs to be better explained as well as exported more effectively to some developing countries. He also stressed the need for more research into crop improvement and agronomic methodologies, saying that "genomics has more to offer to Third World agriculture than First World medicine." "The genome I want to see is that of rice," said Kennedy.

21 March 2001

"THE URBAN EXPLOSION"—A FILM IN THE 2001 D.C. ENVIRONMENTAL FILM FESTIVAL

*Featuring **Hal Weiner**, writer and director of "The Urban Explosion"; **Marilyn Weiner**, producer of "The Urban Explosion"; **Maureen O'Neill**, Senior Regional Urban Coordinator, U.S. Environmental Protection Agency, Region 2; and **Michael White**, Fellow, Woodrow Wilson Center*

More than half the world's population now lives in cities. A major dilemma facing civic, national, and global institutions is how to service this exploding urban base without destroying the delicate natural balance that makes urbanization possible in the first place.

"The Urban Explosion," an hour-long film from Screenscope Inc. originally broadcast as part of the "Journey to Planet Earth" series on PBS, details the dramatic environmental problems of four rapidly growing megacities—Mexico City, Istanbul, Shanghai, and New York—as well as efforts in these metropolises to work towards sustainability. The film was shown at the Wilson Center as part of the 2001 Environmental Film Festival in the Nation's Capital and was followed by a panel discussion that included the filmmakers.

Degradation and Hope

"The Urban Explosion" argues that vast waves of immigration have fueled tremendous rates of urban population growth around the world, leading to dangerous levels of air and water pollution as well as health crises and resource stress that threaten these cities' ultimate viability. For example, breathing the smoggy air of Mexico City (which has 20 million residents and is growing by three million annually) is like smoking two packs of cigarettes daily. And toxic waste runs in the city's open canals and brings cholera to the surrounding valley.

In Istanbul, green space is swallowed up by illegal housing developments, and 50 percent of the city's sewage runs untreated into the neighboring Bosphorous Strait, virtually ruining one of the world most productive fisheries. In Shanghai, the "mecca of materialism" for China, smog from low-grade coal burning, buses, and autos chokes the city. East Harlem is home to six of seven New York City bus depots and suffers from an epidemic of asthma caused by diesel exhaust.

But "The Urban Explosion" also finds hopeful efforts in these cities—by both governments and community groups—to counteract environmental degradation and its assault on livability. Besides tightening their emissions standards and enhancing their rapid transit systems to address air pollution, both Mexico City and

Maureen O'Neill

Shanghai are building deep-tunnel sewage drainage systems in an effort to eliminate open wastewater canals. Texcaco Lake and nearby lands have been restored using treated Mexico City water. Community groups in Istanbul are sponsoring construction of sustainable housing with nearby hospitals, schools, green spaces, and infrastructure. Sweat equity and investment are helping to recapture neighborhoods and common spaces in the South Bronx and Brooklyn. "The Urban Explosion" ends by arguing that the right to sustainability is as much a human right as democratic or economic freedom.

New York: Success and Challenges

Maureen O'Neill of the U.S. EPA Region 2 began the post-screening panel discussion by detailing some of the environmental successes and remaining challenges for New York City. Immigration and the diversity of the

Cosponsored by the Environmental Change and Security Project & the Comparative Urban Studies Project

city impact how government must deal with environmental issues, said O'Neill: for example, a campaign against a number of illegal pesticides sold on the city's street corners and in its bodegas must be conducted in the 140 languages spoken there.

But there have been major environmental successes both in New York (such as the recent city-state watershed protection plan) and the United States (where the aggregate six priority pollutants have gone down since 1970 despite rises in GDP and vehicle miles driven over the same period). "You can have clean air and a healthy economy—they're not opposed," argued O'Neill. She warned, however, that dramatic climate change will affect New York City disproportionately: any rise in sea level because of polar ice-cap melting, for instance, would be disastrous for this predominantly coastal city.

Past and Present Urban Explosions

Demographer **Michael White** followed by contextualizing and historicizing urban population trends. According to White, "urban explosion" has been an oft-repeated theme dating back to the 1950s. In fact, today's urbanization is not out of pace with other urban population booms of the past: many cities have grown rapidly in brief periods, a dynamic usually tied to economic development and in-migration.

What is different about today, said White, is that urbanization is taking place under "incomplete demographic transition"—that is, overall national population growth rates are also growing along with those of their cities. Megacities are also now sprouting up in countries (such as China) that are making fundamental political and economic transitions. While it takes tremendous resources and money to stem environmental degradation, White also argued that strong institutions, governmental regulation, and the prodding of nongovernmental organizations and community groups are also essential to this process. He ended by noting that 90 percent of the world's urbanized population does not live in megacities but will have to respond to the same environmental issues.

The Making of "The Urban Explosion"

Filmmakers **Hal** and **Marilyn Weiner** talked about the making of "The Urban Explosion" (which was originally broadcast in 1999) as well as their plans for future films in the upcoming "Journey to Planet Earth" season. Hal Weiner said that the films they currently have in production will discuss environmental injustice (which he called a "terribly, terribly important issue") as well as emphasize U.S. responsibility in environmental

degradation and the state of the planet. Marilyn Weiner added that grassland loss, infectious diseases, and environmental security issues are also critical to potential global destabilization.

In response to audience questions, Hal Weiner said that recent Bush administration actions have galvanized the environmental community, and that a counter-effort against the weakening of governmental environmental regulations is imminent. Michael White added that the "environment vs. jobs" debate so prevalent today is a false one—that we can have economic development without environmental degradation, but that community groups need to speak out to promote environmental equity. White also noted that discrepancies in resources and general issues of development affect the relative capacities of cities to carry out environmental restoration projects. "What New York City can spend on water resources is vastly different than what Mexico City or Shanghai can spend," said White.

Marilyn Weiner related that U.S. audiences are still very provincial and have to be convinced that conditions in other countries are worth caring about. Hal Weiner concluded by lamenting that the West seems to have written off Africa. He called Africa's lack of health infrastructure and economic development as well as its epidemic of HIV/AIDS "desperate and terribly unfair," and also noted the chronic epidemic of vector-borne diseases in southern Africa. (For example, 11 percent of Kenyan children under 5 die of malaria—a disease easily curable with the proper medicines). **W**

RISKS OF CONFLICT: RESOURCE AND POPULATION PRESSURES

*Featuring **Sir Crispin Tickell**, Chancellor of the University of Kent at Canterbury; Chairman of the Climate Institute of Washington, DC, and President of the Earth Centre in South Yorkshire.*

There are few greater challenges to human society than the risks of conflict arising from human population growth and resource depletion. Sir Crispin Tickell, a longtime British diplomat and former British Permanent Representative to the United Nations who has also headed a variety of scientific, environmental, and sustainability initiatives, detailed these challenges and the world's difficulty in addressing them in a bracing talk.

"A Malignant Maladaptation"

Sir Crispin began by stating that the "world looks a messier place than I have known it during my 36 years as a diplomat." He noted, for example, that violence within societies has increased: of the 27 armed conflicts in 1999, all but two were within national boundaries. Power is also devolving—from nation-states to international institutions, to regional and local communities, and to citizens through old and new technologies of communication.

And the enormous growth in human population and its ever-increasing demands on global resources, said Sir Crispin, are compromising the health of the planet as well as local conditions. In the last century, human population has quadrupled, while air pollution has increased by a factor of five, water use by nine, sulphur emissions by 13, energy use by 16, carbon dioxide emissions by 17, marine fish catches by 35, and industrial output by 40. Sir Crispin maintained that there are few precedents for the current impact on the earth by the human species, whose dominance he called a "malignant maladaptation."

The Five Drivers for Global Change

Sir Crispin went on to argue that most of the implications of these trends remain unrecognized, although they are straining human communities everywhere and increasing the potential for violence. He identified five main drivers for global change—each associated with the others, and all pointing towards risks of social breakdown and conflict.

The first driver is the rate of human population increase, with attendant hyperurbanization and increased absolute poverty. Sir Crispin noted that, between 1992 and 2000, some 450 million new people came to inhabit the earth. "If the increase had been in elephants, swallows,

sharks, mushrooms, or cockroaches, we would have been scared silly," he said, "but as it is ourselves, we shrug our shoulders as if it were the most normal thing in the world."

The second driver is the condition of the land. Increasing populations are claiming more and more space and resources, resulting in widespread soil degradation and advancing deserts. Soil depletion, said Sir Crispin, affects some 10 percent of current world agricultural areas. Meanwhile, increases in food supplies have not kept pace with population growth, and almost a billion people are today undernourished. Similarly, while demand for water (the third driver) doubles every 21 years, water supplies have remained at the same level they were thousands of years ago. The United Nations Environmental Programme has already referred to the existence of "a global water crisis," as major rivers become toxic streams and ocean fish stocks decline past recoverability.

Damage to ecosystems is an additional factor. Sir Crispin said that humans are causing extinction at 1000 times the normal rate, altering the course of evolution itself. The consequences are reduced food supplies and medicine as well as severe damage to forests, wetlands, soil fertility, and the natural cycles of waste reclamation. The final driver, atmospheric chemistry changes, includes acidification from industry, depletion of the atmospheric ozone layer, and the degree of global warming that greenhouse gases will spur. Sir Crispin stated that the combination of these five drivers is most worrying. Impelled by continued human population growth and economic expansion, these factors will eventually result in a creeping contagion of economic breakdown and state failure.

The Conflict-Resource Connection

Sir Crispin said that, while triggers for individual conflicts over resources are most difficult to predict, resource depletion in poor countries has led to a myriad of conflict precursors: poverty, inequity, community tension, and weakened institutions. He also argued that, while industrial countries' vulnerability to these problems is masked by their overconsumption and dependence on fossil fuels, they are generally more vulnerable than supposed. Modern conflicts between nation-states over

resources have so far been rare (with the exception of oil); but this may change. Disputes over water could be a *casus belli,* as could transboundary export of pollution. "What states do to the environment within their boundaries is no longer for them alone," he said.

Refugees are an additional consequence as well as a cause of environmental and state destabilization. Although cases overlap, Sir Crispin noted that there are more environmental refugees (25 million, according to some estimates) then there are political refugees, with particularly large numbers in sub-Saharan Africa. And since one-third of humanity lives within 60 kilometers of a coastline, predicted sea level increases caused by climate change could cause additional massive migrations and tremendous stress on both developed and developing nations.

Sir Crispin concluded on a note of some pessimism. He noted that, while there are prominent cases of transboundary cooperation in the management of environmental flashpoints, catastrophe may be needed to shock people into thinking of the environment, population, and conflict as globally interrelated dynamics.

Bush, Kyoto, and The Future

In response to audience questions, Sir Crispin called the current vogue for market forces as a final arbiter of value a "fashionable delusion," and said that in the last resort the public interest must prevail. He said that the next fifty years will be an extremely difficult period and will see much more disorder and painful adjustment to the limits of environmental resources and population growth.

A regular adviser to British Prime Minister Tony Blair on environmental issues, Sir Crispin said that most governments and institutions are not at the moment well-geared to these problems, and that authoritarian governments often set such big concerns aside altogether because of their ineffective chains of command. He castigated the Bush administration for its recent disavowal of the Kyoto Protocols, saying that the move "shocked and dismayed" Europeans and was an abdication of responsibility "truly out of step with the rest of the world." He raised the possibility that European governments might impose import taxes on U.S. imports to redress the competitive balance, and noted that German consumers are organizing boycotts of U.S. products as a result of the Kyoto announcement.

Sir Crispin ended the discussion period by stressing the importance to population growth reduction of global female empowerment, education, availability of contraceptive devices, and better pensions and state institutions of elderly care.

Sir Crispin Tickell

CONFLICT AND CONTAGION: A SOUTH ASIA SIMULATION

*Featuring **Dr. Helene Gayle**, U.S. Centers for Disease Control and Prevention*

Calling HIV/AIDS "probably the greatest human tragedy of our time," Dr. Helene Gayle of the Centers for Disease Control and Prevention (CDC) told a conference and simulation cosponsored by the Environmental Change and Security Project that India may be the key to the epidemic's global course.

Gayle, director of the CDC's National Center for HIV, Sexually Transmitted Disease, and Tuberculosis Prevention, addressed "Contagion and Stability," a three-day simulation conference hosted by the U.S. Army War College in Carlisle, Pennsylvania. High-level representatives from the U.S. government, foreign embassies, and nongovernmental organizations joined leading scientists, scholars, and researchers to explore and negotiate over a scenario of plague epidemic in India and its consequences for regional and global security.

HIV/AIDS, the Developing World, and India

Gayle's speech highlighted the perniciousness of HIV/AIDS and its strains on the health infrastructures of developing countries. She said that AIDS has risen in the last twenty years from a virtually unknown disease to become the fourth-largest cause of death worldwide and the leading cause of death in Africa. Perhaps even more significantly, the virus most often attacks people in their period of highest economic productivity. Gayle noted that many African countries are already seeing significant declines in important macroeconomic indicators because of AIDS. The epidemic is also taxing health care services that are already overburdened with such diseases as tuberculosis, cholera, and malaria.

India may be a bellwether for the future of AIDS worldwide, said Gayle. Approximately four million Indians are infected with HIV, which is only one percent of the country's population. But Gayle pointed out that over 50 percent of some high-risk populations in India are infected, and that the factors that contribute most to the spread of HIV (population mobility, high rates of sexually-transmitted diseases, and gender inequality) are widespread there. "I think a lot of people actually would say that India, in many ways, may be the country that most influences the global epidemic in the long run,"

said Dr. Gayle.

But there is reason for hope. While India's society and leaders were in denial about the impact of AIDS eight or nine years ago, Gayle said that the Indian government has now made HIV its highest public health issue priority. There is also intense interest in the problem from overseas donors such as the World Bank and the U.S. Agency for International Development. But while praising the Indian government and its international partners, Gayle argued that there are still not enough resources being devoted to fighting HIV/AIDS either in India or globally. "Although there is a clear understanding [about the problem]," Gayle said, "the level of activity, the level of focus, is still not what is should be."

Besides calling for an increase in funding, Gayle outlined a multifaceted approach to address HIV/AIDS worldwide. Keys to the effort are a high-level political commitment to destigmatizing HIV and allowing those affected to seek services without fear of retribution or ostracization. Other steps are: widespread distribution of and education about condoms; private-sector involvement; quality assurance of generic anti-retroviral therapies; and the recruitment of men to HIV prevention.

"We often talk about how, in a society where women's roles are not appreciated, it is important for women to become empowered," said Gayle. "But unless we have the other side of the equation working with it, getting men involved, we are not going to be able to do that job that is necessary in India as well as in other societies."

Disease and Stability in South Asia and the World

Gayle, who starting this fall will be on detail from the CDC to the Bill & Melinda Gates Foundation, then joined the other attendees in the "Conflict and Stability" simulation. Participants divided into teams (representing India, the United States, international organizations, and nongovernmental organizations) to formulate and negotiate responses to a scenario of massive plague outbreak in the Indian state of Andhra Pradesh.

In the scenario, international tensions are high. While India has suggested that both Pakistan and the United

States were involved in the outbreak, some countries either refuse to accept flights from the region or quarantine their passengers. A typhoon on India's western coast forces migration, which threatens to spread the contagion. Meanwhile, a software engineer from Andhra Pradesh's largest city flies to San Francisco, where he is hospitalized with signs of plague.

In essence, the scenario emphasized the global interconnections among issues of population, health, environment, and security: what happens in an Indian village one week can easily affect California the next. Mindful of this, the simulation teams first negotiated a response to the immediate crisis that allowed India to take the lead in managing the outbreak as the international community provided supplies and funding and tried to open channels of regional communication.

The teams then developed long-term policy recommendations both for prevention of another such crisis and for U.S. action. All teams agreed that strengthening South Asian health care infrastructure—with an emphasis on HIV/AIDS care and prevention as well as enhanced delivery at the local level—was essential. Other consensus recommendations included: the easing of trade barriers between the United States and the region; the development of international early crisis warning systems; and a recommitment to education for women and access to family planning as a strategy for poverty alleviation.

ECSP Trade and Environment Forum

Promoting world trade and protecting the global commons are frequently presented as mutual exclusive goals. But this dichotomy often results in a stalemate between the business and environmental communities that inhibits progress both for future trade liberalization and for multilateral environmental solutions.

ECSP launched the Trade and Environment Forum (TEF) in the summer of 2000 to analyze this apparent impasse and to identify solutions. The goal of TEF is to recognize the legitimate claims of both international trade law and environmental law and to identify methods of harmonizing international trading rules with today's rapidly evolving environmental concerns.

International trade rules have been painstakingly developed over the past 50 years, culminating in the creation of the World Trade Organization (WTO) in 1995. At the same time, the Multilateral Environmental Agreement (MEA) has become the preferred approach to addressing international environmental issues. Today, after over a century of development, more than 200 MEAs are in force—over 20 of which have trade implications. The connection between trade and environmental issues is not especially new, but this overlap has generated concern from many parties and a general interest in finding a resolution.

Accordingly, TEF is considering possible approaches to improve governance of the MEAs and to determine the appropriate relationship between MEAs and the WTO. In cooperation with the Heinrich Böll Foundation and the National Wildlife Federation, TEF held a conference on March 29, 2001 on the issue of the WTO and MEAs. In addition, a TEF Web site (http://wwics.si.edu/tef/index.htm) has been created to help publicize these issues and keep abreast of recent developments. TEF has also identified the World Summit on Sustainable Development (to be held in Johannesburg, South Africa in September 2002) as a potentially useful venue for significant progress on the relationship of trade and environment. TEF will hold a series of workshops over the coming year to develop ideas and foster a consensus among the key players on the issues of trade and the environment leading up to Johannesburg.

Proceedings from the March 29, 2001 conference, "The WTO and MEAs," will be available in late August, 2001. For more information on TEF, please contact Bill Krist, Project Director, at KristW1@wwic.si.edu or (703) 989-2626.

22 June 2001

YOUNG MEN AND WAR: COULD WE HAVE PREDICTED THE DISTRIBUTION OF VIOLENT CONFLICTS AT THE END OF THE MILLENNIUM?

*Featuring **Christian Mesquida**, York University and **Neil Wiener**, York University*

Why is war so ubiquitous, both historically and today? In an attempt to answer this question, two psychologists from York University suggest that the size of a country's young male population can tell us if that country will engage in war or suffer from civil unrest. Their theory, which they call "the male age composition hypothesis," challenges the environmental security field's traditional model, which views conflict as the result of a variety of interrelated factors—particularly population growth, resource scarcity, and environmental degradation.

According to **Neil Wiener**, the new hypothesis shares the environmental security model's concern with population growth. But rather than focusing on growth of a society's whole population, the male age composition hypothesis looks at the size of the young male population in comparison to the whole population. The theory does not consider environmental degradation as a factor and looks at resource scarcity and competition only in terms of a "biological/evolutionary view." Wiener and his colleague, **Christian Mesquida**, used the "non-moral" framework of evolutionary psychology to explain the occurrence (and non-occurrence) of "coalitional aggression," a term they use to refer to war and other forms of collective aggression.

Stated simply, the male age composition hypothesis claims that "countries with relatively large numbers of young males are more likely to experience episodes of coalitional aggression."

Where Have All the Young Men Gone? Gone to Soldiers Every One

Building on the neglected 1960s work of scholars Herbert Moller and Gaston Bouthol, Mesquida and Wiener investigated a myriad of societies and conflicts—historical and contemporary, Southern and Northern, rich as well as poor. They studied population size, with particular attention to young men ages 15 to 29, and the severity of conflict, breaking the data down both by country and by continent. Their research showed that countries with more stable young male populations tended toward political stability, while countries with large young male populations tended toward political instability—a thesis that Mesquida and Wiener suggested explains such diverse situations as the 1968 Paris riots, the 1972 Sri Lankan insurgency, and World War I Germany. Mesquida pointed to the former Soviet republics between 1989 and 1993, which all underwent similar political transformations and yet experienced different levels of conflict severity. Mesquida posited that these differences resulted from differences in young male population sizes among the republics.

The researchers also looked at violence in Northern Ireland between 1969 and 1999 and found that the bulk of the victims—those killed by bombs—were young men between the ages of 18 and 30. Mesquida suggested that, as the Irish male population ages, the violence in that troubled area will ease.

A "Natural Phenomenon"

Pointing to war's long history, Wiener called war a "natural phenomenon, in accord with human nature and part of human nature." He explained that human (especially young male) tendencies to engage in coalitional aggression must be an advantageous trait; if not, natural selection would have ensured the trait's extinction by now. Instead, Wiener suggested that coalitional aggression appears to have evolved over the years, with human physiology and chemistry adapting to maximize capabilities for war. In particular, "sexual selection" accounts for coalitional aggression: young men use the resources available to them to attract a mate and reproduce. Males with a high social status (as judged by their culture) are preferred as mates, and in many cultures men can raise their status through war. In poor countries, aggression may be the only resource young men possess to gain a spouse. "Advantaged females" mate with "advantaged males," and consequently the genetic, cognitive, and emotional make-up that supports coalitional aggression is passed on to the next generation. Although war is dangerous, "failure to take risky behavior leads to a worse consequence—failure to reproduce," Wiener explained.

Mesquida displayed a number of pictures of

insurgents—Zapatistas, Khmer Rouge, Somalis, and others—and pointed to a commonality: all of the rebels were young men. Pausing at one photograph, he said, "We see Somalis when, in fact, we should see young men." While these warriors might be acting on the will of the whole population, Mesquida suggested that they most likely were only following their own inclinations.

Mesquida and Wiener also attempted to debunk alternative theories of war and peace that link conflict to poverty or a lack of democracy. Although many scholars believe poverty often leads to conflict, the two psychologists insisted that, while a relationship exists *today* between per capita GDP and conflict, this was not always true. In earlier times, some of the world's wealthiest countries engaged in coalitional aggression. In contradicting the democratic peace theory—the idea that democracies do not go to war with each other—the researchers measured levels of democracy in a number of European countries in 1850 and 1900 using percentages of enfranchised population. Their findings indicate no relationship exists between levels of democratization and propensity to fight. Even "charismatic leaders," such as Saddam Hussein or Napoleon, are actually chosen by their young male populations, Wiener argued.

Wiener and Mesquida concluded that governments should pursue population and immigration policies designed to reduce the young male populations in unstable countries as well as aiming economic policies and pacification efforts at that demographic group. Wiener suggested marrying young men off by giving them the resources to form families via such means as a "family" wage and the expansion of immigration quotas in more stable countries to accept more immigrants from countries with larger young male populations. W

GLOBAL ENVIRONMENTAL CHANGE AND HUMAN SECURITY PROJECT WEB SITE

The Global Environmental Change and Human Security Project (GECHS) has recently overhauled its Web site to include new links and updates. An interdisciplinary research project that strives to advance research and policy efforts in the area of human security and environmental change, GECHS is a core project of the International Human Dimensions Programme on Global Environmental Change (IHDP). Directed by Michael Brklacich, a geographer at Carleton University, the basic objectives of the project are threefold: 1) to promote research activities in the area of global environmental change and human security; 2) to promote dialogue and encourage collaboration among scholars from around the world; and 3) to facilitate improved communication and cooperation between the policy community, other groups (including nongovernmental organizations and the research community).

Different publications such as *AVISO*, a public-policy briefing series and a collaborative effort of GECHS and the Environmental Change and Security Project. Through a cooperative agreement with the University of Michigan Population Fellows Programs, the U.S. Agency for International Development, the Canadian International Development Agency and the University of Victoria all generously support the *AVISO* series.

To learn more about the GECHS Project and its activities, please visit the Project's web site at: http://www.gechs.org.

REPORT OF THE IUCN/IISD TASK FORCE ON ENVIRONMENT & SECURITY

The International Union for the Conservation of Nature (IUCN) and the International Institute for Sustainable Development (IISD) recently partnered to investigate environment and security linkages in a number of case studies around the globe. The resulting edited volume is entitled *Conserving the Peace: How Protecting the Environment Today Can Prevent Conflict and Disaster Tomorrow* and is due out later this year from IISD in Winnipeg. For more information, contact Jason Switzer at jswitzer@iisd.ca.

Table of Contents

UPDATE: NONGOVERNMENTAL & GOVERNMENTAL ACTIVITIES

This UPDATE section highlights the environment, population, and security activities of academic programs, foundations, nongovernmental organizations, government offices, and intergovernmental organizations. If your organization is not listed or if you have an organization to recommend, please contact Robert Lalasz at lalaszrl@wwic.si.edu.

ACADEMIC PROGRAMS

Carolina Population Center

The Carolina Population Center was established at the University of North Carolina at Chapel Hill (UNC-CH) in 1966 to coordinate university-wide programs in population. Forty-eight scholars are currently holding faculty appointments in fifteen UNC-CH departments. The Carolina Population Center provides a multidisciplinary community to carry out population research and train students. The Center's research projects are: the Cebu Longitudinal Health and Nutrition Survey; China Health and Nutrition Survey; Lead and Pregnancy Study; the MEASURE *Evaluation* Project; Nang Rong Projects; the National Longitudinal Study of Adolescent Health; Distance Advancement of Population Research; Alternative Business Models for Family Planning; Life Course Studies; Pregnancy, Infection and Nutrition Study; Dietary Patterns and Trends in the U.S.; and Russia Longitudinal Monitoring Survey. *For more information, contact:* Carolina Population Center, University of North Carolina at Chapel Hill, 123 W. Franklin St., CB#8120 University Square, Chapel Hill, NC 27516-2524; *Tel:* 919/966-2157; *Fax:* 919/966-6638; *Email:* cpcweb@unc.edu; *Internet:* http://www.cpc.unc.edu/

Centre for Development and the Environment (SUM)

The Centre for Development and the Environment (SUM) is a part of the University of Oslo and aims to generate and communicate knowledge in the field of development and environment, by promoting and undertaking interdisciplinary work in collaboration with the established departments of the University. In addition, SUM conducts courses and disseminates research results through publications, seminars, conferences, and workshops. The Centre's research is explicitly policy-oriented using an interdisciplinary approach on the specific theme of environment and development. The three guiding principles of the Centre are: (1) to address the problems and challenges of poverty and environmental degradation; (2) to emphasize that the multi-disciplinary approach of development or environment is insufficient; and (3) to bridge the gap between research and policy to meet the needs of policymakers. *For more information, contact:* the Centre for Development and the Environment, the University of Oslo, P.O. Box 1116, Blindern N-0317 Oslo, Norway; *Tel:* 47-22-85-89-00; *Fax:* 47-22-85-89-20; *Email:* Liv.Norderud@sum.uio.no; *Internet:* http://www.sum.uio.no

Center for Environmental Systems Research

The goals of the Center for Environmental Systems Research are: a) to increase understanding about the functioning of environmental systems and the causes of environmental problems, and b) to identify "sustainable" pathways into

the future, i.e. pathways that allow development of society in harmony with nature. The uniqueness of the Center, created in 1995, lies in its systems approach—the use of methods and instruments of systems thinking such as systems analysis and computer simulation; and in its interdisciplinary approach, in this case meant to be the coupling of social sciences with natural sciences. To accomplish the Center's goals, research activity is carried out in four research groups: Ecosystems Modeling, Human-Environment Interactions, Global and Regional Dynamics, and Environmental Balances. The Center strongly emphasizes collaboration with other institutions both inside and outside Germany. As a young Center, many new projects and themes are under development, which will give greater emphasis to the social and economic aspects of environmental systems, and to topics of global environmental change. Cross-cutting themes under development include: the World Water Program, Society-Environment Interactions, and Global Environmental Security. The Center will also intensify its link between science and policy by using its research findings to help develop national and international environmental policy. *For more information, contact:* Dr. J. Alcamo, Director, or Dr. K.H. Simon, Deputy Director, The Center for Environmental Systems Research, University of Kassel, Kurt-Wolters-Strasse 3, 34109 Kassel, Germany; *Tel:* 49-561-804-3266; *Fax:* 49-561-804-3176; *Email:* alcamo@usf.uni-kassel.de *or* simon@usf.uni-kassel.de; *Internet:* http://www.usf.uni_kassel.de/usf/

Cornell University: Program on Environment and Community (PEC)

The Program on Environment and Community (PEC), housed in Cornell's Center for the Environment, seeks to foster more effective management of environmental, community, and public policy conflicts. To meet this goal, the program aims to build community, institutional, and individual capacities for collaborative decision-making over a broad range of issues. The approach includes: 1) integrating research and practice in selected field-based collaborative decision-making initiatives; 2) providing assistance in conflict assessment and stakeholder analysis, process design, capacity building, and mediation; 3) developing networks and working partnerships among stakeholder groups; and 3) creating multiple learning opportunities through seminars, field studies, program cross visits, applied research, peer exchange, and capacity-building workshops. In the United States, programs have focused on: county planning facilitation; collaborative initiatives with federal, state, and local forestry programs; public issues education; and watershed management. The Program also pursues similar projects in Central America and Southeast Asia. *For more information, contact:* Program on Environment and Community, Center for the Environment, 306 Rice Hall, Cornell University, Ithaca, NY 14853; *Tel:* 607/255-4523; *Fax:* 607/255-8207; *Email:* busters@cornell.edu; *Internet:* http://www.cfe.cornell.edu/pec/

Environmental Policy and Society (EPOS)

Environmental Policy and Society (EPOS) is a research network with a small secretariat at Linkoeping University in Sweden, led by Professor Anders Hjort-af-Ornäs. EPOS's concern has, since the start 1991, been on societal impacts of environmental policy change. This encompasses not only the environmental, but also the socio-cultural and socio-economic security of the local community under the impact of regional, national, and global policies. EPOS's approach is to depart from a community perspective as a means to seek the more general principles that form political dimensions of both environmental and socio-economic processes of change. This approach means, by definition, an interdisciplinary mode of operation; problems addressed are essentially social, but aspects other than those of social science are also required. The problem comprehension of individuals and groups on different levels as well as the capacity of social institutions for problem solving are central in formulating a framework for comprehensive security. The current focus is put on action and policy research with an emphasis on institutional capacity, awareness, and social capital. The special focus of ongoing activities spans from sustainable livelihoods in Eastern African drylands to the socio-cultural framework of small and medium-sized enterprises in Swedish local communities, and from representation of cultural and social attributes of human landscapes in application of EIA to processes of socio-cultural, economic and environmental adaptation among ethnic groups in the mountainous areas of Northern Vietnam. *For more information, contact:* EPOS, Tema Institute, Linkoeping University, 581 83 Linkoeping, Sweden; *Tel:* 46-13-28-25-10; *Fax:* 46-13-28-44-15; *Email:* epos@tema.liu.se; *Internet:* http://www.tema.liu.se/epos

The George Washington University: Space Policy Institute

The Space Policy Institute was established in 1987 as an element of the Center for International Science and Technology Policy of George Washington University's Elliott School of International Affairs. The Institute focuses its activities

on examining policy issues related to the space efforts of the United States and cooperative and competitive interactions in space between the United States and other countries. Using a combination of staff analysis, commissioned papers, groups of experts, research interviews, seminars focused on space and security issues, and a major conference to review the project's recommendations, this project focuses on the following primary issues: 1) understanding the key trends in dual-purpose space technologies; 2) regional security implications of the proliferation of space technology; 3) implications for U.S. military force planning and operations; and 4) recommendations for effective policy responses. *For more information, contact:* Ray A. Williamson or John C. Baker, Space Policy Institute, 2013 G St. NW, Suite 201, The George Washington University, Washington, DC 20052; *Tel:* 202/994-7292; *Fax:* 202/994-1639; *Email:* rayw@gwu.edu *or* jcbaker6@gwu.edu *or* spi@gwu.edu; *Internet:* http://www.gwu.edu/~spi/

The Global Environmental Change and Human Security Project (GECHS)
In May 1996, the Scientific Committee of the International Human Dimensions of Global Change Programme (IHDP) formally adopted the Global Environmental Change and Human Security (GECHS) initiative developed by the Canadian Global Change Programme and the Netherlands Human Dimensions Programme as a core project of the IHDP. At present, there are three other major projects in the IHDP: Land Use and Cover Change (LUCC), which is a joint initiative with the International Geosphere-Biosphere Program (IGBP); Institutional Dimensions of Global Environmental Change (IDGC); and Industrial Transformation (IT). The scientific steering committee is under the directorship of: Mike Brklacich (Canada), Steve Lonergan (Canada), Nils Petter Gleditsch (Norway), Fred Langeweg (Netherlands), Elena Nikitina (Russia), Okechukwu Ibeanu (Nigeria), Chou Meng Tarr (Cambodia), Chris Cocklin (Australia), Edgar Gutierrez-Espeleta (Costa Rica), Elizabeth Hartmann (USA), and Richard Matthew (USA). The objectives of the project are three-fold: to promote research activities in the area of global environmental change and human security (which recognizes the essential integrative nature of the relationship among individual, community, and national vulnerability to environmental change); to encourage the collaboration of scholars internationally; and to facilitate improved communication and cooperation between the policy community/user groups and the research community. *For more information, contact:* GECHS International Project Office, P.O. Box 1700, Victoria, B.C. Canada V8W 2Y2; *Tel:* 250/472-4337; *Fax:* 250/472-4830; *Email:* info@gechs.org; *Internet:* http://www.gechs.org

GECHS at University of California-Irvine
Established in 1999, the GECHS project at the University of California-Irvine combines discussions, research, and policy initiatives in the broad area of environment and security. There are three broad objectives of the project: (1) to promote research activities in the area of global environmental change and human security; (2) to promote dialogue and encourage collaboration among scholars from around the world; and (3) to facilitate improved communication (and cooperation) between the policy community, other groups, including NGOs, and the research community. Research activities are coordinated through the GECHS International Project Office (see above listing). At present, research is being done in areas such as: effects of war, poverty and exploitation on children; environmental security; impacts of environmental stress on small island states; social and ecological effects of landmines; environmental stress, conflict, and insecurity in Pakistan; the linkages between environmental degradation and violent conflict; and environmental stress in Guatemala. *For more information, contact:* Dr. Richard A. Matthew, GECHS at UCI, 212C Social Ecology, University of California, Irvine, Irvine, CA 92697-7075; *Tel:* 949/824-4852; *Fax:* 949/824-2056; *Email:* gechs@uci.edu; *Internet:* http://www.gechs.org/uci

Hampshire College: Population and Development Program
The Population and Development Program at Hampshire College was established in 1986 as the international companion to the Civil Liberties and Public Policy Program. The Program aims to provide students with a multi-disciplinary framework to understand population dynamics and reproductive rights issues internationally. It combines teaching, research, activism, and advocacy in the fields of international women's health, reproductive rights, and population and environment. It monitors changing trends in population policies and critiques conventional neo-Malthusian analyses of population and the environment from a pro-choice, feminist perspective. The Program also serves as the institutional base for the Committee on Women, Population, and the Environment (CWPE), a multiracial network of feminist scholars and activists. CWPE has played an active role in challenging anti-immigrant initiatives

in the U.S. environmental movement. *For more information, contact:* Population and Development Program, Hampshire College/CLPP, Amherst, MA 01002; *Tel:* 413/559-5506; *Fax:* 413/559-6045; *Email:* popdev@hampshire.edu; *Internet:* http://hamp.hampshire.edu/~clpp/popdev.html

Harvard Center for Population and Development Studies

The Harvard Center for Population and Development Studies is a university-wide research center, founded in 1964 as part of the Harvard School of Public Health. The Center's primary aim is to advance understanding of world population and development issues—especially those related to health, natural resources and the environment, human security, and socioeconomic development. The Center's work is characterized by a multidisciplinary approach, a commitment to integrate gender and ethical perspectives in its research, and a strong policy orientation. The Center attempts to advance knowledge through collaborative research, publications, seminars and a working paper series. In addition to advancing knowledge, the Center seeks to foster capacity-building and promote international collaboration to improve health and well-being around the world. About thirty-five full-time residents—including faculty, research fellows, and graduate students—pursue work mainly through multidisciplinary working groups. Other participants are drawn from Harvard faculties and Boston-area universities. The Center also regularly invites visiting scholars from around the world. The Center's current research programs focus on: gender and population policies, demographic transitions, burden of disease, health equity, and human security. The human security program explores concepts of security through research on ethics and international policy, human survival crises during complex humanitarian emergencies, environmental security and new diseases, and population and security. *For more information, contact:* Winifred M. Fitzgerald, Executive Director, Harvard Center for Population and Development Studies, 9 Bow Street, Cambridge, MA 02138; *Tel:* 617/495-2021; *Fax:* 617/495-5418; *Email:* cpds@hsph.harvard.edu; *Internet:* http://www.hsph.harvard.edu/hcpds

Korea University: Ilmin International Relations Institute (IRI)

Ilmin International Relations Institute (IRI) at Korea University is currently conducting the Environmental Security in East Asia project. The objective of the project is to review and examine major environmental security issues in East Asia. The project is one of the three projects sponsored by the United Nations University (UNU) under the title of Non-Traditional Security Issues in East Asia. Dr. Ramesh Thakur, Vice Rector of UNU, is Project Head. The Project focuses on three main areas: (1) Environment and Security-Theoretical Overview and Analytical Framework; (2) Issues and Cases; and (3) Coping with Environmental Security Problems in East Asia. *For more information, contact:* Ilmin International Relations Institute, Korea University, 5th floor, Inchon Memorial Bldg., 5-1 Anam-dong, Sungbuk-ku, Seoul 136-201, Korea; *Tel:* 82-2-927-5265; *Fax:* 82-2-927-5265; *Email:* irikor@unitel.co.kr; *Internet:* http://www.korea.ac.kr/~ilmin/

The Institute for Foreign Policy Analysis, Inc. (IFPA)

The Institute for Foreign Policy Analysis (IFPA) is a non-profit policy research organization affiliated with the Fletcher School of Law and Diplomacy at Tufts University. Founded in 1976, the Institute has performed a wide range of studies of a variety of foreign policy and security affairs issues, as well as the sources, scope and impact of ethnic conflict in the post-Soviet security environment. The Institute specializes in national security, foreign policy, political economics, and government-industrial relations. It has also conducted research on the environment and ethnic conflict. IFPA, and its small business subsidiary, National Security Planning Associates, Inc., is well-known internationally for its ability to organize a wide range of fora that bring together key decision-makers and experts from the international community. These meetings have included senior-level, formal gatherings involving the participation of heads of state and government, leaders of key multinational organizations, and senior parliamentarians; expert-level workshops and round tables; and seminar series on Capitol Hill and elsewhere. With offices in Washington, DC and Cambridge, MA, IFPA has extensive resources upon which to draw in both the worlds of policy and academe. *For more information, contact:* in Cambridge, MA: IFPA, Central Plaza Building, 10th floor, 675 Massachusetts Ave., Cambridge, MA 02139; *Tel:* 617/492-2116; *Fax:* 617/492-8242; *Email:* mail@ifpa.org; in Washington, DC: IFPA, 1725 DeSales Street, NW, Ste. 402, Washington, DC 20036; *Tel:* 202/463-7942; *Fax:* 202/785-2785; *Email:* dcmail@ifpa.org; *Internet:* http://www.ifpa.org/

MIT Project on Environmental Politics and Policy

The Project on Environmental Politics and Policy sees policymaking first and foremost as a political process—the collision of political, economic, social, and philosophical interests—and only secondarily as an exercise in technical problem solving. Addressing environmental problems as though they were fundamentally engineering problem sets most often produces solutions that are politically infeasible, regardless of the technical merits. Accordingly, the Project's goal is to advance an understanding of environmental policymaking as a political process and thereby improve the chances of designing responsive and effective technical policies that can be more readily adopted and implemented. The Project has a broad research agenda. A major line of research examines the ongoing struggle between environmental and economic interests to influence national, state, and local policies. A second line of research investigates the continuing failure of federal agencies to bring ecologically sound management practices to public lands and natural resources held in common. A third line of research explores how local governments and the public absorb and respond to the complex scientific-technical content of local environmental problems and, in turn, how their responses affect technical options for environmental policy. *For more information, contact:* MIT Project on Environmental Politics and Policy, Massachusetts Institute of Technology, Bldg. E53-402, Cambridge, MA 02139; *Tel:* 617/253-8078; *Fax:* 617/258-6164; *Email:* smmeyer@mit.edu; *Internet:* http://web.mit.edu/polisci/mpepp

Monterey Institute of International Studies: Monitoring Newly Independent States Environmental Developments Project (MNISED)

The Monitoring Newly Independent States Environmental Developments Project (MNISED) primary activities involve collecting and disseminating information on environmental and health problems associated with nuclear weapons, missiles, and the civilian nuclear industry in the former Soviet Union. The project is no longer active. However, some of the environmental topics formerly covered by MNISED (such as radioactive waste storage, submarine dismantlement, and spent fuel reprocessing) are currently covered in the Newly Independent States Nuclear Profiles database maintained by the Center for Nonproliferation Studies at the Monterey Institute of International Studies. The database contains the most comprehensive collection of open-source information on nuclear nonproliferation in the former Soviet Union. In 1995, MNISED discontinued publication of its semiannual journal NIS Environmental Watch. Back issues 1-7 are available upon request. *For more information, contact:* Elena K. Sokova, Center for Nonproliferation Studies, Monterey Institute of International Studies, 425 Van Buren St., Monterey, CA 93940; *Tel:* 831/647-4638; *Fax:* 831/647-6672; *Email:* esokova@miis.edu; *Internet:* http://cns.miis.edu

Population Information Program (PIP)

The Population Information Program (PIP) supplies health and family planning professionals and policymakers with authoritative, accurate, and up-to-date information in its journal *Population Reports*, the POPLINE bibliographic database, and the Media/Materials Clearinghouse (M/MC). PIP is supported by the U.S. Agency for International Development (USAID). *For more information, contact:* Population Information Program, 111 Market Place, Suite 310, Baltimore, MD 21202; *Tel:* 410/659-6300; *Fax:* 410/659-6266; *Email:* webadmin@jhuccp.org; *Internet:* http://www.jhuccp.org/pip.stm

Stanford University Center for Environmental Science and Policy (CESP)

The Center for Environmental Science and Policy (CESP), one of the five research centers that make up Stanford University's Institute for International Studies (IIS) operates an integrated teaching and research program in environmental studies. CESP employs an international, interschool, and interdisciplinary approach to seek answers to a number of environmental policy questions. Some of these areas of study include: the consequence of increasing population and per capita energy demand on the global climate, the effect of economic globalization on environmental quality, how to modify farming practices to make agricultural production less sensitive to climate change and less harmful to surrounding environments, the relationship between regional environmental quality and the propensity for conflict, the potential roles for market-based environmental regulations in national and international environmental protection efforts. In all of its efforts, CESP seeks to promote linkages among environmentalists both within and outside of Stanford. The Center serves as the focal point for work at Stanford on science and policies on global change. Most recently, Center faculty members published a paper entitled, "Policy Reforms and Mexican Agricultures:

Views from the Yaqui Valley," *For more information, contact:* Lori McVay, Assistant Director for Finance and Administration, Center for Environmental Science and Policy, Encina Hall, Suite 400, Stanford, CA 94305-6055; *Tel:* 650/725-6851; *Fax:* 650/725-1992; *Email:* lmcvay@leland.stanford.edu; *Internet:* http://cesp.stanford.edu

U.S. Army War College: Center for Strategic Leadership

The U.S. Army War College's Center for Strategic Leadership (CSL) supports the College's curriculum and serves outside customers as well, both governmental and non-governmental. CSL conducts and hosts strategic war games, political-military simulations, peacekeeping courses and exercises, crisis management exercises, and conferences. The Center also conducts research. CSL's national security issues branch, the outreach arm to the national security community, helps senior decisionmakers address national security issues and emerging threats. Recent events have included a Nigeria Delta Game, a Population and Migration Game (co-sponsored by USAID and the Wilson Center), a Pan-African Environmental Security Conference, and a Russian National Security Conference. *For more information, contact:* Center for Strategic Leadership, 650 Wright Avenue, Carlisle, PA 17013-5049; *Tel:* 717/245-4093; *Fax:* 717/245-3030; *Email:* CSL_Info@csl.carlisle.army.mil; *Internet:* http://carlisle-www.army.mil/usaclsl/

University of Maryland: Harrison Program on the Future Global Agenda

Global environmental change, demographic trends, and the diffusion of technological innovations are rapidly reshaping the international system. Disregarding national borders, these forces are transforming international relations, deepening interdependence, and forging a global system from a world of sovereign states. Creating a more sustainable planet for the next century will require dealing with a wide range of policy issues raised by this rapid acceleration of events. The Harrison Program on the Future Global Agenda engages in futures-oriented teaching and research that will contribute to humanity's ability to anticipate and deal effectively with these important currents of change. The Program makes an effort to understand the nature and interaction of environmental, technological, social, and political systems, and to suggest potential means of breaking out of destructive patterns of behavior. To this end, faculty develop new and innovative educational materials, conduct scholarly research, and organize conferences and workshops that bring together scientists, social theorists, advocates, and policymakers to examine key components of the future global agenda. *For more information, contact:* Harrison Program on the Future Global Agenda, Department of Government and Politics, 3140 Tydings Hall, University of Maryland College Park, College Park, MD 20742; *Tel:* 301/405-7490; *Fax:* 301/314-9690; *Email:* harrison@gvpt.umd.edu; *Internet:* http://www.bsos.umd.edu/harrison/

University of Michigan Population Fellows Programs

The University of Michigan Population Fellows Programs was first established in 1984 and is funded through the U.S. Agency for International Development (USAID). The Programs place Fellows with a wide variety of organizations that address family planning and reproductive health issues in developing countries. The Programs provide a modest professional stipend to the Fellows and aims to both enhance the Fellows' skills, as well as to build capacity within host organizations for development of effective and sustainable family planning and reproductive health interventions. Since the Programs' inception, there have been more than 200 professionals placed in the field and an expansion of the Programs' original focus to include several new initiatives, including the Population-Environment Fellows Program (PEFP), the Population, Environmental Change, and Security (PECS) Initiative, and the Minority-Serving Institutions Initiative (MSI). The Environmental Change and Security Project is a key element of the PECS Initiative. Fellows work in a wide variety of settings and perform a wide range of roles for their host organizations. All Fellows, however, gain the opportunity to develop a network of professional contacts and the chance to master new skills in the field of international development assistance. They also gain the opportunity to support meaningful projects around the world. Fellows generally come into the Programs with a Master's degree in a related field and less than five years of professional experience. They leave the Fellows Programs in a position to pursue mid-level career placements in the field of international population/family planning assistance or population-environment. *For more information, contact:* Mita Sengupta Gibson, Manager, Population-Environment Fellows Program, Center for Population Planning, University of Michigan, 1214 South University Avenue, Second Floor, Ann Arbor, MI 48104; *Tel:* 734/763-9456; *Fax:* 734/647-0643; *Email:* pop.fellows@umich.edu *or* popenv@sph.umich.edu; *Internet:* http://www.sph.umich.edu/pfps/

University of Toronto: Project on Environmental Scarcities, State Capacity, and Civil Violence

The Project on Environmental Scarcities, State Capacity, and Civil Violence at the University of Toronto has investigated the impacts of water, forests, and cropland resource scarcities on governmental capabilities in the developing countries of China, India, and Indonesia. The project asks if capacity declines, is there an increased likelihood of widespread civil violence such as riots, ethnic clashes, insurgency, and revolution? The project has targeted its finding for the public and policymakers in Canada, the United States, China, India, and Indonesia. Funding has been provided by The Rockefeller Foundation and The Pew Charitable Trusts. Publications to emerge from the project include *Ecoviolence: Links Among Environment, Population, and Security*, edited by Thomas F. Homer-Dixon and Jessica Blitt, and a new second edition of *Environment, Scarcity, and Violence* by Homer-Dixon. *For more information, contact:* Thomas Homer-Dixon, Principal Investigator, Peace and Conflict Studies Program, University College, 15 King's College Circle, University of Toronto, Toronto, Canada M5S 3H7; *Tel:* 416/978-8148; *Fax:* 416/978-8416; *Email:* pcs.programme@utoronto.ca; *Internet:* http:/www.library.utoronto.ca/pcs/state.htm

Yale Center for Environmental Law and Policy

The Yale Center for Environmental Law and Policy was established in 1994 by the Yale Law School and the Yale School of Forestry and Environmental Studies (YSFES). The Center draws on resources throughout Yale University to develop and advance environmental policy locally, regionally, nationally, and globally. *For more information, contact:* Yale Center for Environmental Law and Policy, 301 Prospect Street, New Haven, CT 06511; *Tel:* 203/432-6065; *Fax:* 203/432-5594; *Email:* epcenter@minerva.cis.yale.edu; *Internet:* www.yale.edu/envirocenter

FOUNDATIONS

Carnegie Corporation

Formed in 1911 by Andrew Carnegie, the Carnegie Corporation awards grant in four broad areas: Education, International Peace and Security, International Development, and Strengthening U.S. Democracy. The grants are made to non-profit organizations and institutions for work that fall in one of these categories and promise to have national or international impact. Areas of interest under international peace and security include: nonproliferation of weapons of mass destruction; fostering democracy and integration of the former Soviet states with the world economy; and new threats to world peace. In addition, it also awards approximately 20 fellowships for one or two years of study for a maximum amount of $100,000 to young scholars whose research is in the corporation's fields of interest. *For more information, contact:* The Carnegie Corporation, 437 Madison Avenue, New York, NY 10022; *Tel:* 212/371-3200; *Fax:* 212/754-4073; *Internet:* http://www.carnegie.org/

Compton Foundation, Inc.

The Compton Foundation was founded to address community, national, and international concerns in the fields of peace and world order, population, and the environment. In a world in which most problems have become increasingly interrelated and universal in dimension, and where survival of human life under conditions worth living is in jeopardy, the Foundation is concerned first and foremost with the prevention of war and the amelioration of world conditions that tend to cause conflict. Primary among these conditions are: the increasing pressures and destabilizing effects of excessive population growth; the alarming depletion of the earth's natural resources; the steady deterioration of the world's environment; and the tenuous status of human rights. To address these problems, the Compton Foundation focuses most of its grant-making in the areas of peace and world order, population, and the environment, with special emphasis on projects that explore the interconnections between these three categories. The Foundation believes that prevention is a more effective strategy than remediation; that research and activism should inform each other; and that both perspectives are needed for productive public debate. *For more information, contact:* Compton Foundation, Inc., 545 Middlefield Road, Suite 178, Menlo Park, CA 94025; *Tel:* 650/328-0101; *Fax:* 650/328-0171; *Email:* info@ComptonFoundation.org; *Internet:* http://www.comptonfoundation.org

Ford Foundation

The Ford Foundation is a resource for innovative people and institutions worldwide. Its goals are: to strengthen

democratic values, reduce poverty and injustice, promote international cooperation, and advance human achievement. A fundamental challenge facing every society is to create political, economic, and social systems that promote peace, human welfare, and the sustainability of the environment on which life depends. The Foundation believes that the best way to meet this challenge is to encourage initiatives by those living and working closest to where problems are located; to promote collaboration among the non-profit, government, and business sectors; and to assure participation by men and women from diverse communities and at all levels of society. It works mainly by making grants or loans that build knowledge and strengthen organizations and networks. Since its financial resources are modest in comparison to societal needs, it focuses on a limited number of problem areas and program strategies within its broad goals. Founded in 1936, the Foundation operated as a local philanthropy in the state of Michigan until 1950, when it expanded to become a national and international foundation. Since inception, it has been an independent, non-profit, nongovernmental organization. It has provided over $10 billion in grants and loans. *For more information, contact:* The Ford Foundation, 320 East 43rd St., New York, NY 10017; *Tel:* 212/573-5000; *Fax:* 212/351-3677; *Email:* office-communications@fordfound.org; *Internet:* http://www.fordfound.org/

Richard and Rhoda Goldman Fund

The Richard and Rhoda Goldman Fund is a private, charitable family foundation that supports non-profit organizations that enhance the quality of life, particularly in the San Francisco Bay Area. The Fund's areas of focus include: environment, population, Jewish affairs, children and youth, the elderly, social and human services, health, education, and the arts. In 2000, the Fund provided $17,430,587 in grants for environment projects and $2,589,666 for population projects. *For more information, contact:* Richard and Rhoda Goldman Fund, One Lombard Street, Suite 303, San Francisco, CA 94111; *Tel:* 415/788-1090; *Fax:* 415/788-7890; *Internet:* http://www.goldmanfund.org

W. Alton Jones Foundation: Sustainable World and Secure World Programs

The W. Alton Jones Foundation seeks to build a sustainable world by developing new ways for humanity to interact responsibly with the planet's ecological systems as well as a secure world by eliminating the possibility of nuclear war and providing alternative methods of resolving conflicts and promoting security. The Sustainable World Program supports efforts that will ensure that human activities do not undermine the quality of life of future generations and do not erode the Earth's capacity to support living organisms. The Foundation addresses this challenge with a tight focus on issues whose resolution will determine how habitable the planet remains over the next century and beyond: maintaining biological diversity; ensuring that human economic activity is based on sound ecological principles; solving humanity's energy needs in environmentally sustainable ways; and avoiding patterns of contamination that erode the planet's capacity to support life. The Secure World Program seeks to build a secure world free from the nuclear threat. The Foundation addresses this challenge by: promoting Common Security and strategies related to how nations can structure their relationships without resorting to nuclear weapons; devising and promoting policy options to control and eventually eliminate existing nuclear arsenals and fissile materials; stemming proliferation of nuclear weapons and related materials; addressing threats to global sustainability by preventing the massive release of radioactive material; and assessing and publicizing the full costs of a nuclear-weapon state. *For more information, contact:* W. Alton Jones Foundation, 232 East High St., Charlottesville, VA 22902-5178; *Tel:* 804/295-2134; *Fax:* 804/295-1648; *Email:* earth@wajones.org; *Internet:* http://www.wajones.org/wajones

The John D. and Catherine T. MacArthur Foundation: Program on Global Security and Sustainability

The objective of the Program on Global Security and Sustainability of the MacArthur Foundation is to promote peace within and among countries, healthy ecosystems worldwide, and responsible reproductive choices. The Foundation encourages work that recognizes the interactions among peace, sustainable development, reproductive health, and the protection of human rights. It supports innovative research and training, the development of new institutions for cooperative action, and new strategies for engaging U.S. audiences in efforts to advance global security and sustainability. The Foundation recognizes the importance of three specific global issues: arms reduction and security policy; ecosystems conservation; and population. These are three core areas of the Program. In addition, support is provided in three key aspects of the global context: the state of understanding of the concepts of security and sustainability; the need for new partnerships and institutions to address global problems; and the education of

the public about the United States' interests and responsibilities regarding global issues. *For more information, contact:* The John D. and Catherine T. MacArthur Foundation, 140 South Dearborn St., Chicago, IL 60603; *Tel:* 312/726-8000; *Fax:* 312/920-6258; *Email:* 4answers@macfound.org; *Internet:* http://www.macfdn.org

The David and Lucile Packard Foundation

The David and Lucile Packard Foundation is a private family foundation created in 1964 by David Packard (1912-1996), co-founder of the Hewlett-Packard Company, and Lucile Salter Packard (1914-1987). The Foundation provides grants to non-profit organizations in the following broad program areas: science, children, population, conservation, arts, community, and special areas that include organizational effectiveness and philanthropy. The Foundation provides national and international grants and also has a special focus on the Northern California counties of San Mateo, Santa Clara, Santa Cruz, and Monterey. The Foundation had $13 billion in assets at the end of 1999 and awarded more than $500 million in grants during 2000. The Foundation is directed by an eight-member Board of Trustees which includes the four children of the founders. A staff of 115 employees conducts the day-to-day operations of the Foundation. *For more information, contact:* The David and Lucile Packard Foundation, 300 Second Street, Suite 200, Los Altos, California 94022; *Tel:* 650/948-7658; *Fax:* 650/948-5793; *Email:* inquiries@packfound.org; *Internet:* http://www.packfound.org

Ploughshares Fund

Founded at a time when global nuclear conflict seemed a real and immediate possibility, the Ploughshares Fund set out to unite concerned individuals in efforts to end the nuclear arms race and the threat of nuclear annihilation. In the intervening years, the character of the nuclear threat has changed but not dissipated. With gifts from thousands of people and a few foundations, Ploughshares has made grants totaling more than $20,000,000. The Ploughshares Fund supports national and grassroots organizations that over the years have forced the closure of nuclear weapons production lines around the country, charging safety and environmental abuses at those facilities. With direct support and technical assistance, Ploughshares enables citizens to monitor and expose the U.S. Department of Energy's (DOE) continued efforts to design, test, and produce nuclear weapons at the expense of environmental cleanup. A coalition of these groups is now suing the DOE to halt construction of new stockpile stewardship facilities, claiming that it has failed to comply with the National Environmental Policy Act. Ploughshares also supports the development of an indigenous network of citizens' groups in the former Soviet Union who are facing equal or greater environmental challenges caused by the production of nuclear weapons in their countries. *For more information, contact:* Ploughshares Fund, Fort Mason Center, Bldg. B, Suite 330, San Francisco, CA 94123; *Tel:* 415/775-2244; *Fax:* 415/775-4529; *Email:* ploughshares@ploughshares.org; *Internet:* http://www.ploughshares.org/

The Rockefeller Brothers Fund: "One World: Sustainable Resource Use" and "Global Security Program"

The goal of the Rockefeller Brothers Fund's sustainable resource use program is to "foster environmental stewardship which is ecologically-based, economically sound, culturally appropriate, and sensitive to questions of intergenerational equity." At the global level, the program promotes international discussions on climate change and biodiversity preservation and supports and publicizes practical, cost-effective models that can contribute to international agreements on these issues. The Global Security Program comprises grant-making in the pursuit of "a more just, sustainable, and peaceful world by improving the cooperative management of transnational threats and challenges," working with public and private actors in North America, East Asia, Central and Eastern Europe, and Southern Africa. The program focuses on constituency building, transparency and inclusive participation, the challenges of economic integration, and emerging transnational concerns. *For more information, contact:* The Rockefeller Brothers Fund, Inc., 437 Madison Avenue, 37th floor, New York, NY 10022-7001; *Tel:* 212/812-4200; *Fax:* 212/812-4299; *Email:* rock@rbf.org; *Internet:* http://www.rbf.org/

Rockefeller Foundation: Global Inclusion Program

The Global Inclusion Program's goals are: a) to build international leadership capable of initiating and carrying out innovative approaches to sustainable development, and b) to facilitate the transition to a new energy paradigm based on sustainability, renewable resources, efficient use, economic viability, and equity in access. The Global Inclusion

program seeks to catalyze the transition to a new energy paradigm in both developed and developing countries by reducing dependence on fossil fuel, and replacing it with renewable-energy sources and increased energy efficiency. In the United States, the Global Inclusion program supports the Energy Foundation's efforts to promote policies, practices, and technologies that help utilities to generate, and end-users to employ, energy at the least financial and environmental cost. The Foundation conceived the Global Energy Initiative, which seeks to demonstrate to high-level, national decision-makers in developing countries the viability of renewable-energy sources by emphasizing their equity and quality-of-life benefits. This Initiative aims to facilitate dialogue among political, business, and community leaders to catalyze selective projects designed to demonstrate an improved quality of life for the rural and urban poor, and simultaneously reduce the threats of pollution and global climate change. *High Stakes: The United States, Global Population and Our Common Future* is a book published by the Foundation. *For more information, contact:* Rockefeller Foundation, Global Inclusion, 420 Fifth Ave., New York, NY 10018; *Tel:* 212/869-8500; *Fax:* 212/764-3468; *Internet:* http://www.rockfound.org/global

Soros Open Society Institute (OSI)

The Open Society Institute (OSI) is a private operating and grant-making foundation that promotes the development of open societies around the world and is active in nearly 60 countries located in Central and Eastern Europe, the former Soviet Union, Haiti, Guatemala, and Southern and West Africa. Established in 1993 and based in New York City, OSI is part of an informal network of autonomous foundations that together form the Soros Foundations network. Both OSI and the Foundations share a common mission of promoting democracy through support to a range of programs in education, civil society, media, and human rights, as well as social, legal, and economic reform. The three broad categories for OSI programs are: Network Programs, U.S. Programs, and Other Initiatives. *For more information contact:* Office of Communications at the Open Society Institute-New York, 400 West 59th Street, New York, NY 10019; *Tel:* 212/548-0668; *Fax:* 212/548-4605; *Internet:* http://www.soros.org

Summit Foundation

The Summit Foundation's grantmaking addresses four main program areas: (1) addressing global population issues; (2) protecting biodiversity in Latin America and the Caribbean; (3) linking population and the environment; (4) innovations in sustainable design. The Foundation supports the mutually-reinforcing goals of expanding access to family planning and reproductive health care as well as of empowering women and youth through educational and economic opportunity, particularly for those living in the world's poorest regions. The Foundation also supports linked field-based projects that stress the close connections among population growth, poverty, unsustainable consumption, and natural resource depletion. *For more information, contact:* The Summit Foundation, 2099 Pennsylvania Avenue NW, 10th Floor, Washington, DC 20006; *Tel:* 202/912-2900; *Email:* info@summitfdn.org; *Internet:* www.summitfdn.org

The Turner Foundation

The Turner Foundation, established by philanthropist and CNN founder Ted Turner, provides grants to organizations for projects in the areas of environment and population. The Foundation seeks to protect water and reduce toxic impacts on the environment; improve air quality by promoting energy efficiency and renewable energy and promoting improved transportation policies; protect biodiversity through habitat preservation; and develop and implement sound, equitable practices and policies designed to reduce population growth rates. The Foundation focuses on domestic (U.S.) projects but will consider international programs. For habitat protection programs, the Foundation gives priority to programs in Russia, Brazil, and British Columbia, Canada, in addition to domestic projects. *For more information, contact:* The Turner Foundation, One CNN Center, Suite 1090, South Tower, Atlanta, GA 30303; *Tel:* 404/681-9900; *Fax:* 404/681-0172; *Internet:* http://www.turnerfoundation.org

United Nations Foundation

The goal of the United Nations Foundation, which was started with a donation from businessman and philanthropist Ted Turner, is to promote economic, social, environmental, and humanitarian causes through the goals and objectives of the United Nations Charter. The foundation engages in grantmaking; establishes partnership networks between UN agencies, the private sector, and NGOs to build support for the UN and to enhance the effectiveness of its

programs; sponsors and conducts outreach efforts aimed at educating the public about the UN's activities; and fundraises. At present, the foundation works with UN agencies and outside partners in two environmental areas: sustainable energy/climate change and ecosystem conservation and biodiversity. *For more information, contact:* United Nations Foundation, 1301 Connecticut Avenue, Suite 700, N.W. Washington, DC 20036; *Tel:* 202/887-9040; *Fax:* 202/887-9021; *Internet:* http://www.unfoundation.org/

NONGOVERNMENTAL ORGANIZATIONS

Adelphi Research

Building bridges across the Atlantic on global environmental issues is the mission of Adelphi Research, a recently established not-for-profit think tank on sustainable development based in Berlin, Germany. Adelphi Research focuses in particular on global environmental change and international environmental regimes. It utilizes research, public policy consulting, and policy dialogues to foster transboundary cooperation on sustainable resource management. The institute's program on "Environment and Sustainable Peace" is composed of a series of research and consulting projects and dialogue forums conducted on behalf of a variety of international organizations and national governments. Adelphi Research is also a partner in a multidisciplinary research team analyzing the impacts of extreme weather events (Security Diagram) and quantitatively linking environmental stress, susceptibility, and crisis. The institute is directed by Alexander Carius (former director of Ecologic) and Walter Kahlenborn. Senior scientists with different academic backgrounds form the core of the consulting team. *For information, e-mail:* office@adelphi-research.de *Internet:* http://www.adelphi-research.de

African Centre for Technology Studies (ACTS): Ecological Conflicts E-Discussion Group

The African Centre for Technology Studies (ACTS), a Nairobi-based international policy research organization, has established a new e-discussion group on the ecological or environmental sources of conflicts in Sub-Saharan Africa. The Centre established the group as a part of the Ecological Sources of Conflicts in Sub-Saharan Africa project, which focuses on policy research, information dissemination, and capacity-building. The project has two overall objectives: 1) to assess the extent to which ecological or environmental factors, such as natural resources scarcity or abundance and environmental improvement or degradation, contribute to political conflicts in Sub-Saharan Africa; and 2) to promote the integration of ecological or environmental considerations into regional conflict prevention and management policies and mechanisms. The e-discussion group is intended: 1) to contribute to the implementation of the project; 2) to disseminate and share research findings with a geographically and disciplinarily diverse group of scholars; 3) to disseminate reference information, Web site links, and announcements of meetings, fellowships, and study opportunities; 4) to share and debate viewpoints on the multiple sources of conflict in Sub-Saharan Africa; and 5) to encourage collaborative research on issues of common interests. *For more information, contact:* African Centre for Technology Studies, P.O. Box 45917, Nairobi, Kenya; *Tel:* 254-2-524000/524700; *Fax:* 254-2-522987/524001; *Email:* acts@cgiar.org; *Email to subscribe:* Ecologicalconflicts-subscribe@yahoogroups.com; *Internet:* http://www.acts.or.ke *or* http://groups.yahoo.com/group/Ecologicalconflicts

The Aspen Institute: International Peace, Security, and Prosperity and Energy, the Environment, and the Economy Programs

The Aspen Institute is an international non-profit educational institution dedicated to enhancing the quality of leadership and policymaking through informed dialogue. The Institute's International Peace, Security, and Prosperity Program conducts high-level international leadership conferences to suggest strategies and actions through which greater peace, equity, prosperity, and sustainable development can be achieved in the early 21st century, particularly in face of the challenges globalization brings. Participants are influential leaders of diverse backgrounds and perspectives from all global regions. Topics have included the new dimensions of national security, the role of intervention in managing conflict, conflict prevention, international poverty, and promoting peace in the Balkans. Conference reports are useful for policymakers, public education, and academic material. The goal of the Aspen Institute Program on Energy, the Environment, and the Economy is to provide the leadership and the forum for consensus building dialogue in the areas of energy and environmental politics. It brings together individuals from many different

segments of government, industry, the investment community, environmental and other public interest groups, and the academic world to address critical issues related to energy and the environment. Recent or current activities include: a series on the Environment in the Twenty-first Century, an annual Energy Policy Forum, a Mexico-U.S. Border Environmental Dialogue, a series on integrating environmental and financial performance, a series on non-proliferation and environmental aspects of nuclear waste policies, and an annual Pacific Rim energy workshop. *For more information, contact:* Nancy Bearg Dyke (International Peace, Security, and Prosperity Program) or John A. Riggs (Program on Energy, the Environment, and the Economy), The Aspen Institute, One Dupont Circle, NW, Suite 700, Washington, DC 20036; *Tel:* 202/736-5800; *Fax:* 202/466-4568; *Email:* nancy.dyke@aspeninstitute.org; *Internet:* http://www.aspeninst.org

Canadian Foundation for the Americas (FOCAL)

Founded in 1990, the Canadian Foundation for the Americas (FOCAL) aims to develop greater understanding of important hemispheric issues and help to build a stronger community of the Americas. As a policy center, FOCAL fosters informed and timely debate and dialogue among decision-makers and opinion leaders in Canada and throughout the Western Hemisphere. FOCAL studies a range of issues in four policy areas: Inter-American Relations, Governance and Human Security, Social Policies, and Economic Integration. In 1999, FOCAL dealt with topics such as: drug trafficking and human security in the Americas; the negotiations of the Free Trade Areas of the Americas; improved health strategies; and Canada's relations with the countries in the Americas. Topics examined by FOCAL on an ongoing basis include the environment and sustainable development. FOCAL is an independent, not-for-profit charitable organization that is guided by a Board of Directors. It receives funding from the Canadian Department of Foreign Affairs and International Trade, the Canadian International Development Agency, and other public and private sector organizations, as well as inter-American institutions. *For more information, contact:* Canadian Foundation for the Americas, 1 Nicholas St., Suite 720, Ottawa, Ontario K1N 7B7, Canada; *Tel:* 613/562-0005; *Fax:* 613/562-2525; *Email:* focal@focal.ca; *Internet:* http://www.focal.ca

Carnegie Endowment for International Peace: Managing Global Issues Project

The Managing Global Issues Project identifies lessons drawn from attempts in the international community to manage a wide range of global issues (including environment, weapons proliferation, organized crime, terrorism, trade, the Internet, and other issues). It examines how innovative mechanisms and techniques used in one arena (such as the NGO-government partnership in drafting and negotiating a land mine accord) can offer positive or negative lessons for the management of other transnational issues (such as negotiating agreements on climate change or global crime). By bringing together experts from a variety of different disciplines and professions, the project aims to strengthen practice and enrich the growing theoretical literature on international organizations and global governance with the insights of actual experience. The project is currently drawing to a close and will publish *Managing Global Issues: Lessons Learned?*, edited by P.J. Simmons and Chantal de Jonge Oudraat, this fall. In addition, the Project has produced the Managing Global Issues Online Information Network, which will continue beyond the life of the Project and allows users to search a database for global governance experts and publications. The Network aims to enlarge the growing community of experts from a variety of different disciplines and professions interested in comparing lessons about managing global problems across diverse issue areas—from environment to arms proliferation. *For more information, contact:* P.J. Simmons, Director, Managing Global Issues Project, 1779 Massachusetts Ave. NW, Washington, DC 20036; *Tel:* 202/939-2259; *Fax:* 202/483-4462; *Email:* pjsimmons@ceip.org; *Internet:* http://www.ceip.org

Center for Defense Information (CDI)

The Center for Defense Information (CDI) is an independent monitoring institution of military activities such as military spending, policies, and weapons systems. Research at CDI can be classified into seven broad categories: Defense and Foreign Policy, Military Forces and Strategy, Arms Trade Issues, European Issues, Nuclear Issues, International Peacekeeping, and Military Spending. *For more information contact:* The Center for Defense Information, 1779 Massachusetts Avenue, N.W., Washington DC 20036; *Tel:* 202/332-0600; *Fax:* 202/462-4559; *Email:* Info@cdi.org; *Internet:* http://www.cdi.org/

The Center for Economic Conversion (CEC)

Founded in 1975, the Center for Economic Conversion (CEC) is a non-profit organization dedicated to creating positive alternatives to dependence on excessive military spending. One of the CEC's top priorities is "green conversion," the transfer of military assets (money, talent, technology, facilities, and equipment) to activities that enhance the natural environment and foster sustainable economic development. This work includes: studies of green conversion efforts already underway in industry, national laboratories, and military bases; a pilot project in green military base conversion; the promotion of public policies that encourage green conversion; and various educational activities that build support for green conversion. *For more information, contact:* Joan Holtzman, Center for Economic Conversion, 222 View St., Mountain View, CA 94041; *Tel:* 650/968-8798; *Fax:* 650/968-1126; *Email:* cec@igc.org; *Internet:* http://www.conversion.org

Center for International Earth Science Information Network (CIESIN)

The Center for International Earth Science Information Network (CIESIN) was established in 1989 as a non-profit, non-governmental organization to provide information that would help scientists, decision-makers, and the public better understand their changing world. CIESIN specializes in global and regional network development, science data management, decision support, and training, education, and technical consultation services. CIESIN is the World Data Center A (WDC-A) for Human Interactions in the Environment. One program CIESIN implemented is the U.S. Global Change Research Information Office (GCRIO). This office provides access to data and information on global change research, adaptation/mitigation strategies and technologies, and global change related educational resources on behalf of the U.S. Global Change Research Program (USGCRP) and its participating federal agencies and organizations. CIESIN is located on Columbia University's Lamont-Doherty Earth Observatory campus in Palisades, New York. *For more information, contact:* CIESIN, PO Box 1000, 61 Route 9W, Palisades, NY 10964; *Tel:* 845/365-8988; *Fax:* 845/365-8922; *Email:* ciesin.info@ciesin.columbia.edu; *Internet:* http://www.ciesin.org

Center for International Studies (CIS)

The Center for International Studies (CIS) is a private, independent, non-profit, Baku-based research and public organization, which was founded in May 1998. The CIS Center focuses on the most challenging issues of international and regional security: oil pipeline politics, energy, environment, conflict resolution, peace, and new geopolitics of great powers within the Caucasus and in the former Soviet Union. The CIS Research Groups work independently on research projects and analyze contemporary geopolitical and international security issues, as well as energy and environmental problems from an Azeri perspective in order to give the public a better profile of the ongoing complex processes and the general situation in the region. *For more information, contact:* Center for International Studies, 528 H. Javid Avenue, Suite 36, Baku 370138, Azerbaijan Republic; *Tel:* 011-994-12-39-5357 *or* 64-4097; *Email:* cis@iatp.baku.az *or* Kabdullayev@iatp.baku.az; *Internet:* http://cis.aznet.org/cis

Center for Public Environmental Oversight (CPEO)

The Center for Public Environmental Oversight (CPEO) is an organization that promotes and facilitates public participation in the oversight of environmental activities, including but not limited to the remediation of U.S. federal facilities, private "Superfund" sites, and Brownfields. It was formed in 1992 as CAREER/PRO (the California Economic Recovery and Environmental Restoration Project) by the San Francisco Urban Institute, in response to the large number of military base closures in the San Francisco Bay Area. CPEO has its roots in community activism, and it provides support for public advocacy, but it is not a political organization. Its work is based upon six principles: Empowerment, Justice, Education, Communications, Partnership, and Credibility. CPEO publishes two newsletters: "Citizens' Report on the Military and the Environment" and "Citizens' Report on Brownfields." *For more information, contact:* SFSU Center for Public Environmental Oversight, 425 Market St., 2nd Floor, San Francisco, CA 94105; *Tel:* 415/405-7751; *Fax:* 415/904-7765; *Email:* cpeo@cpeo.org; *Internet:* http://www.cpeo.org

The Center for Security Policy

The Center for Security Policy exists as a non-profit organization to stimulate and inform the national and international debates about all aspects of security policy, including their strategic and environmental implications, particularly as they relate to the all-encompassing question of energy. The Center is committed to preserving the credibility of U.S.

antiproliferation efforts, and the message to allies and potential adversaries that the U.S. is serious about ensuring the safe and benign global development of nuclear energy. The Center has extensively studied the Chemical Weapons Convention, the Cienfuegos nuclear power project in Cuba, and expressed concern over the Department of Energy's Environmental Management program for cleaning up the nuclear legacy of the Cold War. In addition, the Center calls for increased attention to the strategic importance of the vast oil reserves of the Caspian Basin, and to the deterioration of the sensitive ecosystems and waterways of the region (for example Turkey's imperiled Bosphorus Straits). The Center makes a unique contribution to the debate about these and other aspects of security and environmental policies, through its rapid preparation and dissemination of analyses and policy recommendations via computerized fax, published articles, and electronic media. *For more information, contact:* The Center for Security Policy, 1920 L St., NW, Suite 210, Washington, DC 20036; *Tel:* 202/835-9077; *Fax:* 202/835-9066; *Email:* info@security-policy.org; *Internet:* http://www.security-policy.org/aboutcsp.html

Climate Institute (CI)

The Climate Institute (CI) is an international organization devoted to helping maintain the balance between climate and life on Earth. In all its efforts, including the Climate Alert newsletter, the Institute strives to be the world's foremost authority on climate change information, science, and response and serves as a facilitator of dialogue among scientists, policymakers, business executives, and citizens. CI has informed key policymakers and heightened international awareness of climate change and has worked to identify practical ways of achieving substantive emissions reductions. Currently, the Institute has taken the role of catalyst in policy discussions on energy efficiency and renewable energy. CI provides expert advice at ministerial and heads of state briefings and at sessions with business executives and private citizens. CI's Green Energy Investment project works to mobilize investors to finance and accelerate the development of renewable and "greenhouse-benign" energy technologies. The Small Island States Greening Initiative assists the island states in adapting to climate change and transforming their energy systems to renewables. *For more information, contact:* The Climate Institute, 333 ½ Pennsylvania Ave. SE, Washington, DC 20003; *Tel:* 202/547-0104; *Fax:* 202/547-0111; *Email:* info@climate.org; *Internet:* http://www.climate.org

The Club of Rome

Members of the Club of Rome are convinced that the future of humankind is not determined once and for all, and that it is possible to avoid present and foreseeable catastrophes when they are the result of human selfishness or of mistakes made in managing world affairs. In 1972 the Club published *Limits to Growth*, a companion book to their World computer model indicating trends for growth on this planet. The model considered the effects on growth of population, agricultural production, consumption of non-renewable natural resources, industrial production, and pollution. *Limits to Growth* was followed in the early 1990s by *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future. Beyond the Limits* encouraged a comprehensive revision of policies and practices that perpetuate growth in material consumption and in population and a drastic increase in the efficiency with which materials and energy are used. The modeling work for these projects spread to the International Institute of Applied Systems Analysis in Vienna, where it inspired many more projects and conferences. Both the books and the computer model, and many successive ones, have become teaching tools and have been instituted in training games. *For more information, contact:* Uwe Möller, Secretary General, The Club of Rome, Rissener Landstr. 193, 22559 Hamburg, Germany; *Tel:* 49-40-81960714; *Fax:* 49-40-8960715; *Internet:* http://www.clubofrome.org

Committee on Population

The Committee on Population was established in 1983 by the National Academy of Sciences to bring the knowledge and methods of the population sciences to bear on major issues of science and public policy. The Committee's work includes both basic studies of fertility, health and mortality, and migration, and applied studies aimed at improving programs for the public health and welfare in the United States and developing countries. The Committee also fosters communication among researchers in different disciplines and countries and policymakers in government and international agencies. Recent reports of the Committee include *Forced Migration and Mortality*, *Cells and Surveys: Should Biological Measures Be Included in Social Science Research*, and *Beyond Six Billion: Forecasting the World's Population. For more information, contact:* National Research Council, Committee on Population, 2101 Constitution Ave. NW, HA-172,

Washington, DC 20418; *Tel:* 202/334-3167; *Fax:* 202/334-3768; *Email:* cpop@nas.edu; *Internet:* http://www4.nas.edu/cbsse/cpop.nsf/web/homepage

Ecologic—Institute for International and European Environmental Policy

Ecologic was established in 1995 as a not-for-profit institution for applied research and policy consulting. Ecologic is part of the network of Institutes for European Environmental Policy with offices in Arnhem, London, Madrid, Paris, and Brussels, as well as a wider network of associated researchers. The mission of this network is to analyze and advance environmental policy in Europe. The main themes of Ecologic's work are: strategic dimensions of environmental policy, the environmental policy of the European Union and its member states, multilateral environmental agreements, trade and environment, environment and development, environment and security policy, environmental policy instruments, green finance, regulation, and enforcement, as well as various issues of air pollution control, waste management, and water management and policy. Ecologic works for diverse sponsors and clients including: international and supranational organizations, parliaments, governments, national agencies, and local authorities. In addition, research is carried out for or in cooperation with industry, trade unions, and environmental or conservationist NGOs. Some completed and ongoing projects include "Impact of EU Enlargement on European Environmental Policy," "Water Rights," and "International Workshop on Environment and Security." *For more information, contact:* Ecologic, Pfalzburger Strasse 43/44, D-10717 Berlin, Germany; *Tel:* 49-30-86880 0; *Fax:* 49-30-86880 100; *Email:* office@ecologic.de; *Internet:* http://www.ecologic.de

Environmental and Energy Study Institute (EESI)

The Environmental and Energy Study Institute (EESI) is a non-profit organization dedicated to promoting environmentally sustainable societies. EESI believes meeting this goal requires transitions to social and economic patterns that sustain people, the environment and the natural resources upon which present and future generations depend. EESI produces credible, timely information and innovative public policy initiatives that lead to these transitions. These products are developed and promoted through action-oriented briefings, workshops, analysis, publications, task forces, and working groups. *For more information, contact:* Carol Werner, Executive Director, 122 C Street, NW, Suite 700, Washington, DC 20001; *Tel:* 202/628-1400; *Email:* eesi@eesi.org

Evidence Based Research, Inc. (EBR)

Evidence Based Research (EBR) is a for-profit research and analysis firm specializing in applied social science to support decision-makers in government and private industry. EBR believes that decisionmaking is best supported by the appropriate balance of social theory and relevant empirical evidence. In keeping with this philosophy, the company provides policymakers in business, government, and other organizations with clear and concise analyses of important issues. EBR has expertise in several program areas, including environmental security, globalization, command and control, indicators and warning, and instability analysis. EBR research on environmental security has focused on providing clients with support on relations between environmental factors and national security. EBR has provided research and technical support to the Department of Defense and participated in the NATO CCMS Pilot Study "Environment and Security in an International Context." EBR has also supported the development of regional strategies for the US Southern and European Commands and in the Asia Pacific region. *For more information, contact:* Evidence Based Research, Inc., 1595 Spring Hill Rd., Suite 250, Vienna, VA 22182-2228; *Tel:* 703/893-6800; *Fax:* 703/821-7742; *Email:* rehayes@ebrinc.com; *Internet:* http://www.ebrinc.com

Federation of American Scientists (FAS)

The Federation of American Scientists (FAS) has several projects that address environment and security linkages. FAS is collaborating with Dr. Walter Parham of the South China Agricultural University on an effort to call attention to the degraded tropical lands of South China. Restoration of these lands will not only benefit Chinese economic stability and improve living conditions for the farmers, but will have the global consequence of significantly reducing the threat of climate change. FAS also sponsors a project that addresses policy surrounding global security issues impacted by outbreaks of animal and zoonotic diseases called AHEAD (Animal Health/Emerging Animal Disease), as well as a related pilot program in Tanzania to monitor disease outbreak. *For more information, contact:* Federation of

American Scientists, 1717 K Street, N.W., Suite 209, Washington, DC 20036; *Tel:* 202/546-3300; *Fax:* 202/675-1010; *Email:* fas@fas.org; *Internet:* http://www.fas.org

Fridtjof Nansen Institute (FNI)

Established in 1958, the independent Fridtjof Nansen Institute (FNI) conducts applied and basic social science research on international issues of energy, resource management, and the environment. Placing a particular emphasis on an interdisciplinary approach, FNI strives to meet academic quality standards while producing user-relevant and topical results. Projects of particular relevance for environmental change and security include the International Northern Sea Route Programme and the Green Globe Yearbook. *For more information, contact:* Professor Willy Østreng, Director, the Fridtjof Nansen Institute, Fridtjof Nansens vei 17, Postboks 324, Lysaker, Norway N-1324; *Tel:* 47-67-53-89-12; *Fax:* 47-67-12-50-47; *Email:* willy.ostreng@fni.no; *Internet:* www.fni.no/

Future Harvest

Future Harvest seeks to promote the importance of agriculture and international agricultural research by raising awareness of their wider social benefits, including peace, prosperity, environmental renewal, health, and the alleviation of human suffering. Future Harvest commissions studies on the links between agriculture and critical global issues. Study results are widely disseminated through the media and global influentials who serve as ambassadors. Current work explores the connection between food insecurity and the degradation of natural resources and violent conflict, as well as the consequences of this conflict for migration, international intervention, and global peace. *For more information, contact:* Barbara Alison Rose, Director of Operations, Future Harvest, PMB 238, 2020 Pennsylvania Avenue, NW, Washington, DC, 20006; *Tel:* 202/473-4734; *Fax:* 202/473-8110; *Email:* info@futureharvest.org

Global Disaster Information Network (GDIN)

Global Disaster Information Network (GDIN) is a voluntary, independent, self-sustaining, non-profit association of nations, organizations, and professionals, from all sectors of society with an interest in sharing natural and technological (e.g. oil spills) disaster information. This partnership will utilize existing (ground and ocean sensors, satellites, etc.) and new technologies (see GDIN-endorsed pilot projects on the web). By facilitating the flow of critical information, GDIN aims to improve the effectiveness and interoperability of current disaster information systems. One of the most important benefits of this partnership will be the improvement of early warning systems that will lessen losses of life and property. *For more information, contact:* Larry Roeder, Executive Director, GDIN International, U.S. Department of State, IO/SHA, Rm 5336, Main State, Washington, DC 20520; *Tel:* 202/647-5070; *Fax:* 202/647-4628, *Email:* lroeder@hotmail.com; *Internet:* www.gdin-international.org

Global Environment and Energy in the 21st Century (GEE-21)

Global Environment and Energy in the 21st Century (GEE-21) is a not-for-profit organization, which carries out research and education activities dealing with issues of environment and energy. It is incorporated in Hawaii, with an international Board of Directors. The initial program areas of GEE-21 are: global climate change, with the emphasis on strategies for reducing emissions of greenhouse gases from energy systems; water and security in South Asia; and cooperation in the transfer and diffusion of environment-friendly energy technologies. The activities undertaken by GEE-21 are carried out in collaboration with institutions in several countries, such as the Asian Institute of Technology (Thailand), the Fridtjof Nansen Institute (Norway), and the School of Advanced International Studies of the Johns Hopkins University (U.S.). *For more information, contact:* GEE-21: 1765 Ala Moana Boulevard, #1189, Honolulu, HI 96815-1420; *Tel:* 808/951-5672; *Fax:* 808/394-0814; *Email:* gee.21@att.net; *Internet:* www.gee21.org

Global Green USA

Founded in 1994 by Mikhail Gorbachev, Global Green USA works in cooperation with individuals, industry, and government to foster a global value shift toward a sustainable and secure future. Major activities include addressing environmental problems arising out of the Cold War, such as military toxic waste, and promoting environment-friendly strategies in the power sector. The Business and Environmentalists Allied for Recycling (BEAR) is an alliance of businesses, recyclers, environmentalists, and other stakeholders working to maximize the recycling of beverage

containers. Other focus areas include: reducing resource consumption, fostering sustainable communities, and shifting patterns of consumption by addressing the issues of land-use, energy, infill development and brownfields, open space, and reuse/ rehabilitation of homes and workplaces. *For more information, contact:* Global Green USA, 227 Broadway, Suite 302, Santa Monica, CA 90401; *Tel:* 310/39 47700; *Fax:* 310/39 47750; *Email:* ggusa@globalgreen.org; *Internet:* http://www.globalgreen.org

Global Green USA: Legacy Program

The goal of the Legacy Program is to create a legacy of peace by creating a sustainable and secure future. It works toward this goal by facilitating communication and dialogue among stakeholders in the U.S. and abroad to advance the proper, accelerated cleanup of the legacy of military toxic contamination. The Legacy Program also supports the safe and sound demilitarization of both conventional and mass destruction weapons, and thereby full implementation of arms control treaties, and promotes the sustainable re-use of affected facilities. Current efforts include a Washington, DC office focused on public education and policy advocacy to strengthen military-related pollution clean-up and CHEMTRUST, a five-year project designed to build public participation in Russian and American decision-making for chemical weapons demilitarization. *For more information, contact:* GG USA Legacy Program, 1025 Vermont Ave. NW, Suite 300, Washington, DC 20005-6303; *Tel:* 202/879-3181; *Fax:* 202/879-3182; *Email:* jleas@globalgreen.org *or* pwalker@globalgreen.org; *Internet:* http://www.globalgreen.org

Global Security and Cooperation Program

The Global Security and Cooperation Program, the successor to the International Peace and Security Program, aims to encourage new thinking about security issues through encouraging scholars and practitioners to work together, understand each other's frameworks and mine each other's bodies of knowledge. The program is supported by the MacArthur Foundation and springs from the understanding that a practically oriented international security studies field must be constituted by scholars and practitioners from all over the world. To fulfill this goal, the program offers 16 two-year fellowships annually to doctoral students, professors, and practitioners (lawyers, journalists, activists). The program also runs a small grants program for "Research Collaboration in Conflict Zones," which is open to applicants living or working in conflict zones. *For more information, contact:* Social Science Research Council, 810 Seventh Avenue, New York, NY 10019; *Tel:* 212/377-2700; *Email:* gsc@ssrc.org; *Internet:* www.ssrc.org

Global Water Partnership (GWP)

The Global Water Partnership (GWP) is an international network comprising a large number of developed and developing country government institutions, United Nations agencies, development banks, professional associations, research institutions, NGOs, and private sector organizations. GWP initiatives are based on the Dublin-Rio principles articulated in 1992 and are intended to support national, regional, and international cooperation and coordination of activities and to foster investment in water resource activities. These initiatives include: supporting integrated water resources management; information-sharing mechanisms; developing innovative solutions to conflicts over water resources; suggesting practical policies based on these solutions; and helping to match needs to available resources. GWP also hosts an independent, on-line interactive venue for knowledge and networking called the Water Forum at http://www.gwpforum.org. The Water Forum serves as a tool for information exchange and exploration among individuals, organizations, the private sector, and academia with interest in fresh water management. *For more information, contact:* GWP Secretariat, c/o Sida, Sveavägen 24-26, 7th floor, SE 105,25, Stockholm, Sweden; *Tel:* 46-8-698 5000; *Fax:* 46-8-698 5627; *Email:* gwp@sida.se; *Internet:* http://www.gwpforum.org

The Heinrich Böll Foundation

With headquarters in Berlin, Germany, the Heinrich Böll Foundation is a political foundation for the promotion of democratic ideas, civil society, and international understanding. It is associated with the political party Alliance 90/ The Greens, and its work is oriented towards ecology, democracy, solidarity, and non-violence. At present, one of the key themes of the Foundation's international work is "Ecology and Sustainable Development." The Foundation's projects, in cooperation with partner organizations, include exchanges, educational programs, and study tours. The Foundation maintains offices in eleven countries outside of Germany. *For more information, contact:* Sascha Muller-

Kraenner, Heinrich Böll Foundation, Washington Office, Chelsea Gardens, 1638 R St. NW, Suite 120, Washington, DC 20009; *Tel:* 202/462-7513; *Fax:* 202/462-5230; *Email:* washington@boell.de; *Internet:* http://www.ased.org/ or http://www.boell.de

Institute for Alternative Futures (IAF)

The Institute for Alternative Futures (IAF) is a non-profit futures research think-tank founded by Clement Bezold, James Dator, and Alvin Toffler in 1977. IAF aims to help individuals and organizations more wisely choose and create the futures they prefer. The Institute provides clients with services to enable them to understand the accelerating pace of change and focus their energies on clarifying their highest aspirations. IAF conducts projects in a broad variety of areas, such as anticipatory democracy, environment, government, health, and pharmaceuticals. Environmental projects include sustainable future programs, while government programming has included working with the President's Council on Sustainable Development. IAF's longest running program, the Foresight Seminars, initiated in 1978, are the Institute's primary public education program. The Seminars provide Congress, federal agencies, and the public with health futures research and future-oriented public policy analysis. *For more information, contact:* Institute for Alternative Futures, 100 N. Pitt St., Suite 235, Alexandria, VA 22314-3134; *Tel:* 703/684-5880; *Fax:* 703/684-0640; *Email:* futurist@altfutures.com; *Internet:* http://www.altfutures.com

Institute for Defense Analysis (IDA)

The Institute for Defense Analysis (IDA) is a non-profit corporation whose purpose is to promote national security and the public interest and whose primary mission is to assist the Office of the Secretary of Defense, the Joint Staff, the unified commands and defense agencies in addressing important national security issues, particularly those requiring scientific and technical expertise. To avoid institutional pressures, IDA does not work directly for the military departments. It also does not work for private industry or foreign governments. IDA's research focuses on defense systems, technologies, operations, strategies, and resources. The work addresses issues of both long-term and immediate concern. IDA's research program includes multi-year efforts and quick response analyses in areas of established expertise. *For more information, contact:* The Institute of Defense Analysis, 1801 N. Beauregard Street, Alexandria, VA 22311-1772; *Tel:* 703/845-2000; *Internet:* http://www.ida.org/index.html

Institute for Sustainable Communities (ISC)

The Institute for Sustainable Communities (ISC) is an independent, non-profit organization, founded in 1991 by former governor of Vermont Madeleine Kunin. ISC provides training, technical assistance, and financial support to communities in existing and emerging democracies to help them build better futures. The mission of ISC is to promote environmental protection and economic and social well-being through integrated strategies at the local level. ISC projects emphasize participating actively in civic life, developing stronger democratic institutions, and engaging diverse interests in decision making. ISC is based in Montpelier, Vermont with offices in Russia, Macedonia, and Bulgaria. *For more information, contact:* George Hamilton, Executive Director, Institute for Sustainable Communities, 56 College St., Montpelier, VT 05602; *Tel:* 802/229-2900; *Fax:* 802/229-2919; *Email:* isc@iscvt.org; *Internet:* http://www.iscvt.org

International Center for Research on Women (ICRW)

The International Center for Research on Women (ICRW) is a private, non-profit organization dedicated to promoting social and economic development with women's full participation. ICRW generates quality, empirical information and technical assistance on women's productive and reproductive roles, their status in the family, their leadership in society, and their management of environmental resources. The Center's publications included "New Directions for the Study of Women and Environmental Degradation" and "Women, Land, and Sustainable Development." ICRW advocates with governments and multilateral agencies, convenes experts in formal and informal forums, and engages in an active publications and information program to advance women's rights and opportunities. ICRW was founded in 1976 and focuses principally on women in developing and transition countries. *For more information, contact:* International Center for Research on Women (ICRW), 1717 Massachusetts Ave. NW, Suite 302, Washington, DC 20036; *Tel:* 202/797-0007; *Fax:* 202/797-0020; *Email:* info@icrw.org; *Internet:* http://www.icrw.org

International Food Policy Research Institute (IFPRI)

The International Food Policy Research Institute (IFPRI) was established in 1975 to identify and analyze policies for sustainably meeting the food needs of the poor in developing countries and to disseminate the results of the research to policymakers and others concerned with food and agricultural policy. IFPRI research focuses on economic growth and poverty alleviation in low income countries, improving the well-being of poor people, and sound management of the natural resource base that supports agriculture. IFPRI is a member of the Consultative Group on International Agricultural Research (CGIAR), an association of sixteen international research centers, and receives support from a number of governments, multilateral organizations, and foundations. IFPRI supports Future Harvest, a public awareness campaign that builds understanding of the importance of agricultural issues and international agricultural research. *For more information, contact:* International Food Policy Research Institute, 2033 K St. NW, Washington, DC 20006; *Tel:* 202/862-5600; *Fax:* 202/467-4439; *Email:* ifpri@cgiar.org; *Internet:* http://www.ifpri.cgiar.org

International Human Dimensions Programme (IHDP) on Global Environmental Change

The International Human Dimensions Programme (IHDP) is an international, non-governmental and interdisciplinary research program that fosters high quality research to address the most pressing questions on the human dimensions of Global Environmental Change. IHDP aims at producing research results relevant to the policymaking community. Promoting, supporting and coordinating research are key activities. In addition, IHDP facilitates research capacity building and international scientific networking. One of the four core projects of IHDP is entitled Global Environmental Change and Human Security (GECHS). The GECHS project focuses on developing a better understanding of issues such as: food security and vulnerability to disruption in food supply as a result of GEC; the role of cooperative agreements in conflicts over water management; and effects of land degradation and global warming on human life and security. *For more information, contact:* IHDP, Walter-Flex-Strasse 3, 53113 Bonn, Germany. *Tel:* 49-228-739050; *Fax:* 49-228-789054; *Email:* ihdp@uni-bonn.de; *Internet:* www.ihdp.org

International Institute for Sustainable Development (IISD)

The mission of the International Institute for Sustainable Development (IISD) is to champion innovation, enabling societies to live sustainably. The IISD contributes new knowledge and concepts, undertakes policy research and analysis, demonstrates how to measure progress, and identifies and disseminates sustainable development information. Its focus is on such topics and issues as international trade and investment, economic policy, climate change, measures and indicators, and natural resource management to make development sustainable. The theme of environment and security is common across their work. *For more information, contact:* International Institute for Sustainable Development, 161 Portage Ave. East, 6th Floor, Winnipeg, Manitoba R3B 0Y4, Canada; *Tel:* 204/958-7700; *Fax:* 204/958-7710; *Email:* info@iisd.ca; *Internet:* http://www.iisd.org

International Institute of Applied System Analysis (IIASA)

The International Institute of Applied System Analysis (IIASA) is a non-governmental research organization located in Austria. International teams of experts from various disciplines conduct scientific studies on environmental, economic, technological, and social issues in the context of human dimensions of global change. Since its inception in 1972, IIASA has been the site of successful international scientific collaboration in addressing areas of concern for all advanced societies, such as energy, environment, risk, and human settlement. The Institute is sponsored by National Member Organizations in North America, Europe, and Asia. *For more information, contact:* International Institute for Applied Systems Analysis, A-2361 Laxenburg, Austria; *Tel:* 43-2236-807-0; *Fax:* 43-2236-71313; *Email:* inf@iiasa.ac.at; *Internet:* http://www.iiasa.ac.at/

International Peace Research Institute, Oslo (PRIO)

The International Peace Research Institute in Oslo (PRIO) was founded in 1959 as one of the world's first centers of peace research. Research at PRIO is divided into four Strategic Institute Programmes: conditions of war and peace; foreign and security policies; ethics, norms, and identities; and conflict resolution and peacebuilding. Researchers at PRIO have published significant theoretical contributions on the concept of security while also investigating the specific linkages between environment, poverty, and conflict. PRIO also makes ongoing contributions as the editorial home to both *The Journal of Peace Research* and *Security Dialogue. For more information, contact:* International Peace Research

Institute (PRIO), Fuglehauggata 11, N-0260 Oslo, Norway; *Tel:* 47-22-54-77-00; *Fax:* 47-22-54-77-01; *Email:* info@prio.no; *Internet:* http://www.prio.no/

International Policy Council on Agriculture, Food, and Trade (IPC)

The International Policy Council on Agriculture, Food, and Trade (IPC) is dedicated to developing and advocating policies that support an efficient and open global food and agricultural system that promotes production and distribution of food supplies adequate to meet the needs of the world's population. IPC was founded in 1987 as an independent group of leaders in food and agriculture from twenty developed and developing countries. It conveys its recommendations directly to policymakers, and publishes a variety of papers and studies. *For more information, contact:* International Policy Council on Agriculture, Food, and Trade, 1616 P Street NW, Suite 100, Washington, DC 20036; *Tel:* 202/328-5056; *Fax:* 202/328-5133; *Email:* IPCAFT@RFF.ORG; *Internet:* http://www.agritrade.org

IUCN-The World Conservation Union

IUCN is an international conservation organization with a membership of over 900 bodies, including states, government agencies, and non-government organizations across some 140 countries, as well as scientific and technical networks. The mission of IUCN is to influence, encourage, and assist societies to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. It has been an important actor: in promoting effective global governance through contributions to multilateral agreements such as CITES and the Biodiversity Convention; in environmental mediation (e.g. OkaVango Delta, Victoria Falls); and at the regional and national levels (e.g. national conservation strategies and transboundary ecosystem management). IUCN, with the World Bank, created the World Commission on Dams, which has recently released *Dams and Development – A New Framework for Decision-Making,* a report on the future of large dams, including environmental and social dimensions. IUCN has also conducted an important study for the Organization for Economic Cooperation and Development (OECD) on environment and security. In October 2000, The Second IUCN World Conservation Congress was held in Amman, Jordan, at which environment and security was one of the important topics discussed. Environment and Security remains an important area of IUCN's work, translating practical lessons learned on issues drawn from its field experience into the policy arenas, and is an important function of IUCN's Commission on Environmental, Economic and Social Policy. IUCN's chief scientist has written a book on the relationship between war and biodiversity, *Nature in War – Biodiversity Conservation During Conflicts. For more information, contact:* Scott A. Hajost, Executive Director, IUCN-US, 1630 Connecticut Ave. NW, 3rd Floor, Washington, DC 20009; *Tel:* 202/387-4826; *Fax:* 202/387-4823; *Email:* postmaster@iucnus.org; *Internet:* http://www.iucn.org/

Migration Policy Institute *(Formerly the International Migration Policy Program of the Carnegie Endowment for International Peace)*

The Institute is a leading source of expert analysis and policy ideas on migrant and refugee issues. It focuses on bridging the worlds of research and policy, bringing an independent voice to migrant and refugee policy debates, and enhancing public understanding of these and related issues. Its activities extend to Russia and other post-Soviet states, as well as numerous other governments, leading independent institutions, the UN, and other international agencies. *For more information, contact:* Demetrios Papademetriou and Kathleen Newland, Migration Policy Institute, 1400 16th Street, N.W., Washington, DC 20036; *Tel:* 202/266-1940; *Fax:* 202/266-1900; *Email:* Info@migrationpolicy.org; *Internet:* www.migrationpolicy.org

The National Council for Science and the Environment (NCSE)

The National Council for Science and the Environment (NCSE) is a non-profit organization, which works to improve the scientific basis for environmental decision making. Guided by the needs of stakeholders, NCSE educates society about the importance of comprehensive scientific programs that integrate crosscutting research with knowledge assessments, education, information dissemination, and training. The objectives of NCSE are: a) bringing about the full implementation of the recommendations of the National Science Foundation's (NSF's) report, *Environmental Science and Engineering for the 21st Century: The Role of the National Science Foundation*; b) facilitating stakeholder actions to develop a shared understanding of science, science needs and priorities; c) working to link science with decision making; and d) providing and creating an on-line information dissemination system that allows all users to find

understandable, science-based information about the environment. *For more information, contact:* National Council for Science and the Environment, 1725 K Street N.W., Suite 212, Washington, DC 20006-1401; *Tel:* 202/530-5810; *Fax:* 202/628-4311; *Email:* info@NCSEonline.org; *Internet:* http://ncseonline.org

The Natural Resources Defense Council (NRDC)

The Natural Resources Defense Council (NRDC) is a U.S. non-profit environmental protection organization with over 400,000 members and a staff of attorneys, scientists, and specialists addressing the full range of pressing environmental problems. The NRDC has had a long and active program related to environment and security. NRDC has engaged in extensive advocacy with the U.S. government and international institutions on climate change and other global common problems and on environmental challenges in developing countries. Since the 1992 Earth Summit, NRDC has worked on the creation and approach of new mechanisms to hold governments accountable to commitments they have made to move toward "sustainable development." NRDC has a new initiative in China on energy efficiency and renewables. NRDC continues to undertake research, analysis, and advocacy related to nuclear weapons production and dismantlement, nuclear materials and proliferation, and nuclear energy. *For more information, contact:* Natural Resources Defense Council, 40 West 20th Street, New York, NY 10011; *Tel:* 212/727-2700; *Fax:* 212/727-1773; *Email:* nrdcinfo@nrdc.org; *Internet:* http://www.nrdc.org

The Nautilus Institute for Security and Sustainable Development

The Nautilus Institute is a policy-oriented research and consulting organization. Nautilus promotes international cooperation for security and ecologically sustainable development. Programs embrace both global and regional issues, with a focus on the Asia-Pacific region. Nautilus has produced a number of policy-oriented studies on these topics which are available on the Internet and in hard copy. Current projects include the Energy, Security, and Environment Program, which studies the intersection of these three issues in Northeast Asia, especially Japan, and seeks sustainable policy alternatives, and the Global Peace and Security Program, which identifies ways to avoid and resolve conflict without force, especially in Northeast Asia. The Northeast Asia Peace and Security Network (NAPSNet) and the South Asia Nuclear Dialogue Network (SANDNet) are among the information services the Institute offers to subscribers free of charge via Email. *For more information, contact:* The Nautilus Institute, 125 University Ave., Berkeley, CA 94710; *Tel:* 510/295-6100; *Fax:* 510/295-6130; *Email:* nautilus@nautilus.org; *Internet:* http://www.nautilus.org

Overseas Development Institute (ODI)

The Overseas Development Institute (ODI) is one of Britain's leading independent think tanks on international development and humanitarian issues. Its mission is to inspire and inform policy and practice, which lead to the reduction of poverty, the alleviation of suffering, and the achievement of sustainable livelihoods in developing countries. ODI does this by linking together high-quality applied research, practical policy advice, and policy-focused dissemination and debate. The Institute works with partners in the public and private sectors, in both developing and developed countries. ODI's work centers on five research and policy programs: the Humanitarian Policy Group, the International Economic Development Group, the Forest Policy and Environment Group, the Rural Policy and Environment Group, and the Poverty and Public Policy Group, which includes the Centre for Aid and Public Expenditure. ODI publishes two journals, the *Development Policy Review* and *Disasters: The Journal of Disaster Studies, Policy and Management* and manages three international networks linking researchers, policymakers, and practitioners: the Agricultural Research and Extension Network, the Rural Development Forestry Network, and the Humanitarian Practice Network. ODI also manages the ODI Fellowship Scheme, which places up to twenty young economists each year on attachment to the governments of developing countries. As a registered charity, ODI is dependent on outside funds and is supported by grants and donations from public and private sources. *For more information, contact:* Overseas Development Institute, 111 Westminster Bridge Road, London SE1 7JD, United Kingdom; *Tel:* 44-(0)20-7922-0300; *Fax:* 44-(0)20-7922-0399; *Email:* odi@odi.org.uk; *Internet:* http://www.odi.org.uk

The Pacific Institute

The Pacific Institute for Studies in Development, Environment, and Security, directed by Peter H. Gleick, is an independent, non-profit research center created in 1987 to conduct research and policy analysis in the areas of

environmental degradation, sustainable development, and international security, with an emphasis on the nexus of these issues. The Institute has three broad goals: 1) to conduct policy-relevant research on the nexus of international security, environmental change and degradation, and economic development; 2) to collaborate on complementary research efforts with other organizations and individuals; and 3) to actively work on developing solutions with policymakers, activists, and members of the general public. The Institute has been a leader in research on how resource issues may fuel instability and conflict, focusing on freshwater resources, climate change, and resource management. Recent projects include: assessments of the impact of climate change on freshwater ecosystems and small island nations, the role of the International Whaling Commission in protecting cetaceans from climate change, and the rise of ecoterrorism. *For more information, contact:* The Pacific Institute for Studies in Development, Environment, and Security, 654 13th St., Oakland, CA 94612; *Tel:* 510/251-1600; *Fax:* 510/251-2203; *Email:* pistaff@pacinst.org; *Internet:* http://www.pacinst.org

Pew Center on Global Climate Change

Joining forces under a new organization, the Pew Center On Global Climate Change, diverse sectors of society are now coming together to steer our nation and the world toward reasonable, responsible, and equitable solutions to our global climate change problems. The Center brings a new cooperative approach and critical scientific, economic, and technological expertise to the global debate on climate change. Established in 1998 by the Pew Charitable Trusts, the Center is directed by Eileen Claussen, former U.S. Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs. Major companies and other organizations are working together through the Center to educate the public on the risks, challenges and solutions to climate change. These efforts at cooperation and education are spearheaded by the Center's Business Environmental Leadership Council. The Pew Center is committed to the development of a wide range of reports and policy analyses that will add new facts and perspectives to the climate change debate in key areas, such as economic and environmental impacts, and equity issues. *For more information, contact:* Pew Center on Global Climate Change**,** 2101 Wilson Blvd., Suite 550, Arlington, VA 22201; *Tel:* 703/516-4146; *Fax:* 703/841-1422; *Internet*: http://www.pewclimate.org

Population Action International (PAI)

Population Action International (PAI) promotes the early stabilization of world population through policies that enable all women and couples to decide for themselves, safely and in good health, whether and when to have children. The organization advocates for voluntary family planning programs, other reproductive health services, and education and economic opportunities for girls and women. PAI works to foster the development of U.S. and international population policy through policy research, public education, and political advocacy. PAI has conducted research and published on the relationship of population dynamics to the sustainability of natural resources critical to human well-being. The program also considers interactions between population dynamics and economic change, public health and security. Most recently, the program has begun an initiative related to community-based population and environment activities, defined as provision of services linking natural resources management and reproductive health at the request of communities. In 1998 PAI published *Plan and Conserve: A Source Book on Linking Population and Environmental Services in Communities.* Other departments within PAI explore issues related to population policy and funding, provision of reproductive health services, the education of girls, and legislative initiatives related to international population issues. *For more information, contact:* Population Action International, 1300 19th St. NW, 2nd floor, Washington, DC 20036; *Tel:* 202/557-3400; *Fax:* 202/728-4177; *Email:* pai@popact.org; *Internet:* http://www.populationaction.org

Population and Environment Program, National Wildlife Federation

The Population and Environment Program is an effort to educate the public about the link between population growth and its effect on wildlife habitat and the global environment. The program maintains a list of activists known as the Fast Action Network who receive newsletters as well as legislative updates about the funding status of beneficial international family planning (IFP) programs. IFP reduces population growth and aids in improving the quality of life for impoverished women, children, and men. The Federation's Population and Environment Program works with similar organizations, such as Zero Population Growth, Audubon's Population and Habitat Program, and Population Action International. Several free educational materials are available, including factsheets, an

informational video, and a poster. *For more information, contact:* Population & Environment Program, National Wildlife Federation (NWF), 1400 16th Street, NW, Suite 501, Washington, DC 20036; *Tel:* 202/797-6800; *Fax:* 202/797-5486; *Email:* population@nwf.org; *Internet:* http://www.nwf.org/population/

Population and Habitat Program

National Audubon Society has launched a major new initiative to build a public mandate for population and family planning and to connect the issues of population growth with habitat. Through this program, Audubon will draw upon its chapters and other community leadership to educate and mobilize citizens from around the country to confront population and environment problems and to communicate with policymakers. The National Audubon Society has embarked on a broad-based effort to strengthen U.S. leadership on population, utilizing its expertise in grassroots activism. The Population & Habitat Program focuses on: 1) restoration of international population funding and 2) connecting population issues to state and local habitat issues. To these ends, the Population Program has already put three State Coordinators in place in Colorado, Pennsylvania, and New York, with plans for additional Coordinators in California, Florida, Ohio, and Texas. These Coordinators will design a three-year plan identifying local population issues and their impacts on birds, wildlife, and habitat. They will conduct training for activists and provide chapters and the public with ways to become involved in the Program. The Program produced a publication in 1998 called *Population & Habitat in the New Millennium*, by Ken Strom, that helps activists make the connections among population growth, consumption, and environmental issues and includes provocative discussions and possible solutions. *For more information, contact:* Population & Habitat Program, National Audubon Society, 1901 Pennsylvania Avenue, NW, Suite 1100, Washington, DC 20006; *Tel:* 202/861-2242; *Email:* population@audubon.org; *Internet:* http://www.audubonpopulation.org

Population Council

The Population Council, a non-profit, nongovernmental research organization established in 1952, seeks to improve the well-being and reproductive health of current and future generations around the world and to help achieve a humane, equitable, and sustainable balance between people and resources. The Council analyzes population issues and trends; conducts research in the social and reproductive sciences; develops new contraceptives; works with public and private agencies to improve the quality and outreach of family planning and reproductive health services; helps governments design and implement effective population policies; communicates the results of research in the population field to diverse audiences; and helps strengthen professional resources in developing countries through collaborative research and programs, technical exchange, awards, and fellowships. Research and programs are carried out by three divisions—the Center for Biomedical Research, the Policy Research Division, and the International Programs Division—and by two Distinguished Colleagues. Council headquarters and the Center for Biomedical Research are located in New York City and the Council also has five regional and 15 country offices overseas. Over 500 women and men from more than 70 countries work for the Council; more than a third hold advanced degrees. Roughly 50 percent are based in developing countries. Council staff collaborate with developing country colleagues to conduct research and programs in over 40 countries in Africa, Asia, the Middle East, Latin America, and the Caribbean. The organization's funds come from governments, multilateral organizations, foundations and other nongovernmental organizations, corporations, individuals, and internal sources. The Council's annual budget for 2000 was $70.9 million. *For more information, contact:* Population Council, 1 Dag Hammarskjkold Plaza, New York, NY 10017; *Tel:* 212/339-0525; *Fax:* 212/755-6052; *Email:* pubinfo@popcouncil.org; *Internet:* www.popcouncil.org

The Population-Environment Research Network

The Population-Environment Research Network, a non-profit, web-based information source, aims to further academic research on population and environment by promoting on-line scientific exchange among researchers from social and natural science disciplines worldwide. The Network provides: (1) an on-line research database that offers bibliographies, project descriptions, and reviews of research on population-environment dynamics; (2) a cyber seminar series, featuring on-line discussions of selected research papers; and (3) a "what's new?" page on their Web site. The project is sponsored by the International Union for the Scientific Study of Population (IUSSP) and the International Human Dimensions Program (IHDP) on Global Environmental Change. Technical support is provided by the Socioeconomic Data and Applications Center (SEDAC) at the Center for International Earth Science

Information Network (CIESIN) at Columbia University. The Network is funded by the MacArthur Foundation. *For more information, contact:* www.populationenvironmentresearch.org

The Population Institute

The Population Institute is a private, non-profit organization working for a more equitable balance among the world's population, environment, and resources. The Institute was founded in 1969. Since 1980, it has dedicated its efforts exclusively to creating awareness of international population issues among policymakers, the media, and the public. In pursuing its goals, the Institute works in three specific programmatic areas: the development of the largest grassroots network in the international population field; providing the media with timely and accurate information on global population issues; and the tracking of public policy and legislation affecting population. The Institute's Future Leaders Program recruits college students and recent graduates as fellows for a one-year period in its community leaders, information and education, and public policy divisions. The Institute annually presents Global Media Awards for Excellence in Population Reporting to journalists in 15 media categories, and the Global Statesman Award to world leaders. It is also the official sponsor of World Population Awareness Week (WPAW), a week of awareness-raising activities co-sponsored by organizations worldwide. The Institute publishes: the bimonthly newspaper, *POPLINE*, the most widely circulated newspaper devoted exclusively to population issues; the 21st Century monologue series, exploring the interrelationships between population and other major issues; educational materials and books. Regional representatives of the Population Institute are located in Bogota, Columbia; Colombo, Sri Lanka; and Brussels, Belgium. *For more information, contact:* Werner Fornos, President, The Population Institute, 107 Second St. NE, Washington, DC 20002; *Tel:* 202/544-3300; *Fax:* 202/544-0068; *Email:* web@populationinstitute.org; *Internet:* www.populationinstitute.org

Population Matters

In 1996, RAND launched Population Matters, a program for research communication that uses different means, methods, and formats for reaching audiences that influence the making of population policy in the United States and abroad. With support from a consortium of donors led by the William and Flora Hewlett Foundation and including the David and Lucile Packard Foundation and the Rockefeller Foundation, the program is addressing the concern that empirical population research is missing opportunities to inform policymaking and public awareness. RAND's involvement is also intended to fill the need for an objective "information broker" who does not espouse a political or ideological point of view on population issues. The program has two principal goals: 1) to raise awareness of and highlight the importance of population policy issues, and 2) to provide a more scientific basis for public debate over population policy questions. To date, the project has examined 12 topics: the record of family planning programs in developing countries; population growth in Egypt; congressional views of population and family planning issues; American public opinion on population issues; Russia's demographic crisis; immigration in California; the national security implications of demographic factors; interrelations between population and the environment; global shifts in population and their implications; U.S. demographic changes; policy, health, and development in Asia; and the value of U.S. support for international demographic research. *For more information, contact:* Dr. Julie DaVanzo, RAND, 1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138; *Tel:* 310/393-0411-7516; *Fax:* 310/260-8035; *Email:* Julie_DaVanzo@rand.org; *Internet:* http://www.rand.org/popmatters

The Population Reference Bureau (PRB)

The Population Reference Bureau (PRB) provides information to policymakers, educators, the media, opinion leaders and the public around the world about U.S. and international population trends. PRB examines the links among population, environment, and security. PRB conducts a number of projects that deal with these linkages. Under the Southern Population and Environment Initiative, PRB works with developing country policy research institutions that work on the relationship between population variables, health impacts, and the environment to enhance the quality and impact of their work. Other PRB projects include MEASURE Communication, a USAID-funded program to help institutions in developing countries improve their communication of research findings; World Population and the Media; and Japan's International Population Assistance, a study of Japan's foreign population assistance; and U.S. in the World, which helps Americans relate population-environment interactions in the U.S. to those in developing nations. *For more information, contact:* Population Reference Bureau, 1875 Connecticut Ave. NW,

Suite 520, Washington, DC 20009-5728; *Tel:* 202/483-1100; *Fax:* 202/328-3937; *Email:* popref@prb.org; *Internet:* http://www.prb.org

Population Resource Center

The Population Resource Center seeks to improve public policymaking by keeping policymakers informed on the latest demographic data and trends. The Center publishes numerous reports on domestic and international demographic trends and issues and brings experts and policymakers together through educational programs, ranging from small discussion groups and policy briefings to large symposia. The educational programs respond to policymakers' questions on issues such as immigration, teen pregnancy, child care, aging, and international population growth. The Center's Web site provides demographic profiles for a number of countries as well as several regions of the world and offers links to a number of governmental and nongovernmental organizations focused on international population issues. The Center's most recent international programming covered such topics as AIDS and infectious diseases, the status of women, and family planning. *For more information, contact:* in New Jersey: Population Resource Center, 15 Roszel Road, Princeton, NJ 08540; *Tel:* 609/452-2822; *Fax:* 609/452-0010; Email: prc@prcnj.org; *Internet:* http://www.prcnj.org; or in Washington, DC: Population Resource Center, 1725 K Street, NW, Suite 1102, Washington, DC 20006; *Tel:* 202/467-5030; *Fax:* 202/467-5034; *Email:* prc@prcdc.org; *Internet:* http://www.prcdc.org

Resources Conflict Institute (RECONCILE)

The phenomenal population growth in Kenya since independence has exerted immense pressure on the natural resource base, leading to an escalation in both the intensity and the scope of natural resource conflicts. In order to address natural resources conflicts it is necessary to recognize and utilize existing capacities within resource dependent communities as well as build new capacities in response to new forms and manifestations of conflict over natural resources. It is this challenge that the Resources Conflict Institute (RECONCILE) seeks to meet. RECONCILE works for the reconciliation of competing resource needs to promote the sustainable management of natural resources and the promotion of sustainable development. In this work, it is guided by a commitment to achieve the following objectives: a) to understand, articulate and promote the use of traditional natural resource management systems, institutions, concepts, and practices in addressing existing and emerging natural resource conflicts; b) to use natural resource conflicts as an entry point for understanding and addressing the resource needs, opportunities and constraints of resource dependent communities and for devising and promoting policy options for equitable access to and control of natural resources by these communities; and c) to engage and use the legal system and the legal process in Kenya in addressing conflicts over access to and control of natural resources by resource dependent communities. *For more information, contact:* Executive Director, Resources Conflict Institute (RECONCILE), Printing House Road, P.O. Box 7150, Nakuru, Kenya; *Tel:* 254-37-44940; *Fax:* 254-37-212865; *Email:* Reconcile@net2000ke.com

Resources for the Future (RFF)

Resources for the Future (RFF) is an independent, non-profit research organization that aims to help people make better decisions about the environment. RFF is committed to elevating public debate about natural resources and the environment by providing accurate, objective information to policymakers, legislators, public opinion leaders, and environmentalists. RFF has four main research areas: environment; natural resources; intersections; and methods, tools, and techniques. Currently, RFF has several programs which address environment and security linkages including a program on nuclear weapons cleanup and the International Institutional Development and Environmental Assistance Program (IIDEA). IIDEA is aimed at helping countries and institutions become more effective environmental actors by focusing on implementation and management of environmental law and policy. IIDEA's mission is to reduce environmental risk and enhance environmental security by working to bridge the gap between formal commitment and actual practice. *For more information, contact:* Resources for the Future, 1616 P St. NW, Washington, DC 20036; *Tel:* 202/328-5000; *Fax:* 202/939-3460; *Internet:* http://www.rff.org

Rocky Mountain Institute

The Rocky Mountain Institute is an independent, non-profit research and educational foundation, which works to foster the efficient and restorative use of resources to create a more secure, prosperous, and life-sustaining world.

Its research focuses on the interlinked areas of: energy, transportation, real-estate development, water and agriculture, community economic development, corporate practices, and security. The Institute endeavors to develop a balanced concept of national and global security that will ensure a better quality of life for future generations. *For more information, contact:* Rocky Mountain Institute, 1739 Snowmass Creek Rd., Snowmass, CO 81654-9199; *Tel:* 970/927-3851; *Fax:* 970/927-3420; *Email:* outreach@rmi.org; *Internet:* http://www.rmi.org

The Royal Institute of International Affairs Energy and Environmental Programme

The Energy and Environmental Programme is the largest of the research programs based at the Royal Institute of International Affairs (Chatham House). The Programme works with business, government, academic, and NGO experts to carry out and publish research and stimulate debate on key energy and environmental issues with international implications, particularly those just emerging into the consciousness of policymakers. *For more information, contact:* Energy and Environmental Programme, Royal Institute of International Affairs, Chatham House, 10 St. James's Square, London SW1Y 4LE, England; *Tel:* 44-(0)20 7957-5711; *Fax:* 44-(0)20 7957-5710; *Email:* eep-admin@riia.org; *Internet:* http://www.riia.org/eep.html

Stockholm Environment Institute (SEI)

The Stockholm Environment Institute (SEI), established in 1989, is an independent, international research institute specializing in sustainable development and environment issues. It works at local, national, regional, and global policy levels. The SEI research program aims to clarify the requirements, strategies, and policies for a transition to sustainability. These goals are linked to the principles advocated in Agenda 21 and Conventions such as Climate Change, Ozone Layer Protection, and Biological Diversity. SEI examines the policy connections and implications of scientific and technical analysis. The Institute carries out its mission through five main program areas: sustainable development studies, atmospheric environment, water resources, climate and energy resources, and risk and vulnerability. The results of SEI research are made available to a wide range of audiences through publications, electronic communication, software packages, conferences, training workshops, specialist courses, and roundtable policy dialogues. The Institute has its headquarters in Stockholm with a network structure of permanent and associated staff worldwide and centers in Boston (USA), York (UK), and Tallinn (Estonia). The collaborative network consists of scientists, research institutes, project advisors, and field staff located in over 20 countries. *For more information, contact:* Roger Kasperson, Executive Director, Stockholm Environment Institute, Lilla Nygatan 1, Box 2142, S-103 14 Stockholm, Sweden; *Tel:* 46-8-412-1400; *Fax:* 46-8-723-0348; *Email:* postmaster@sei.se; *Internet:* http://www.sei.se

Tata Energy and Resources Institute (TERI)

The Tata Energy and Resources Institute (TERI) is an independent, not-for-profit research institute in New Delhi, India, with a focus on multidisciplinary, applied, and integrated research. Its mission is to develop and promote technologies, policies, and institutions for the efficient and sustainable use of natural resources. TERI focuses on all aspects of natural resource protection and management—energy, environment, biotechnology, forestry, infrastructure, and various facets of sustainable development. The Institute also focuses on information dissemination across India and to a select international audience including the training of professionals from India and abroad. Topics covered in these training activities include energy, environment, and development. TERI was formed as part of an Indian national effort to identify and tackle some of the long-term challenges facing the energy sector and includes a Centre on Environmental Studies. It was established in 1974 with generous funding from the Tata group of companies. *For more information, contact:* TERI, Darbari Seth Block, Habitat Place, Lodhi Road, New Delhi 110 003, India; *Tel:* 91-11-462-2246 *or* 460-1550; *Fax:* 91-11-462-1770 *or* 463-2609; *Email:* mailbox@teri.res.in; *Internet:* http://www.teriin.org. *TERI also has a North America office at:* 1600 Wilson Boulevard, Suite 710, Arlington, VA 22209; *Tel:* 703/841-1136; *Fax:* 703/243-1865; *Email:* teri@igc.org

Wild Aid

Wild Aid, formerly the Global Security Network, is a non-profit organization that provides direct protection to wildlife in danger by strengthening the field protection for animals, combating illegal wildlife trafficking, and working to convincing wildlife consumers to change their habits. Wild Aid combines investigations, public media campaigns, direct action programs, and global networking to identify, expose, and address flagrant violations of environmental

and human rights. Some of their accomplishments include establishing a successful, world-renowned wildlife recovery program in the Russian Far East, reducing the consumption of endangered species through their international multimedia Asian Conservation Awareness Program (ACAP), and addressing human trafficking and associated human rights abuses. *For more information, contact:* Wild Aid, 450 Pacific Avenue, Suite 201, San Francisco, CA 94133; *Tel:* 415/834-3174; *Fax:* 415/834-1759; *Email:* info@wildaid.org; *Internet:* www.wildaid.org

World Resources Institute (WRI)

Established in 1982, the mission of the World Resources Institute (WRI) is to move human society to live in ways that protect the Earth's environment and its capacity to provide for the needs and aspirations of current and future generations. Because people are inspired by ideas, empowered by knowledge, and moved to change by greater understanding, WRI provides—and helps other institutions provide—objective information and practical proposals for policy and institutional change that will foster environmentally sound, socially equitable development. To further its mission, WRI conducts policy research, publicizes policy options, encourages adoption of innovative approaches, and provides strong technical support to governments, corporations, international institutions, and environmental NGOs. WRI's current areas of work include: biological resources; climate, energy and pollution; economics; information; and institutions and governance. *For more information contact:* World Resources Institute, 10 G Street, NE, Suite 800, Washington, DC 20002; *Tel:* 202/729-7600; *Fax:* 202/729-7610; *Email:* front@wri.org; *Internet:* http://www.wri.org/wri/

Worldwatch Institute

Worldwatch Institute is dedicated to informing policymakers and the public about emerging global problems and trends and the complex links between the world's economy and its environmental support systems. The Institute aims to foster the evolution of an environmentally sustainable society through inter-disciplinary, non-partisan research on emerging global environmental concerns, including population and security issues. The Institute recently published Paper 155, "Still Waiting for the Jubilee: Pragmatic Solutions for the Third World Debt Crisis" and a book entitled *Vanishing Borders: Protecting the Planet in the Age of Globalization* by Hilary French. Worldwatch researcher Michael Renner published in late 1997 Paper 137 on the destructive effects of small arms proliferation entitled *Small Arms, Big Impact: The Next Challenge of Disarmament*; Mr. Renner's 1996 publication *Fighting for Survival: Environmental Decline, Social Conflict, and the New Age of Insecurity* deals with international security and environment/sustainable development. Lester Brown's 1995 book, *Who Will Feed China? Wake-up Call for a Small Planet*, examines the challenges associated with sustainably meeting the needs of a rapidly expanding population. The Institute's annual publications, *State of the World* and *Vital Signs*, provide a comprehensive review and analysis of the state of the environment and trends that are shaping its future. The Institute's bimonthly magazine, *World Watch*, complements these reports with updates and in-depth articles on a host of environmental issues. Other Worldwatch publications discuss redefining security in the context of global environmental and social issues, the impact of population growth on the earth's resources, and other major environmental issues; and Worldwatch will continue these analyses into the future. *For more information, contact:* Worldwatch Institute, 1776 Massachusetts Ave. NW, Washington, DC 20036; *Tel:* 202/452-1999; *Fax:* 202/296-7365; *Email:* worldwatch@worldwatch.org; *Internet:* http://www.worldwatch.org

U.S. GOVERNMENTAL ACTIVITIES

Editor's Note: Many of these offices were still being reorganized under the transition to the Bush administration at press time. Please consult the Web sites of these departments and activities for the latest mission, staffing, or contact information.

U.S. Army Environmental Policy Institute (AEPI)

The U.S. Army Environmental Policy Institute (AEPI) was established in 1989. The AEPI mission is to assist the Army Secretariat in developing proactive policies and strategies to address both current and future Army environmental challenges. Study topics include: developing an environmental training strategy for Department of Defense's (DoD)

approach to Native Americans/Alaskan Indian environmental issues; environmental justice; pollution prevention policy in weapon systems acquisition; privatization and competitive outsourcing; implementing the Army's National Environmental Policy Act (NEPA); environmental legislation monitoring and impact analysis; and environmental issues that are likely challenges or opportunities for the Army in future years. Expert consultant services recently included such areas as public involvement policy; environmental issue management for overseas military operations; and environmental policy for exploded and unexploded ordnance on training ranges. AEPI augments its small, multi-disciplined permanent staff with experts from the private sector, academia, and other Army, DoD, and governmental agencies. The Institute has published more than twenty policy papers on pertinent environmental issues. Recent titles include "Installations and Watersheds: An Examination of Changes in Water Management on Army Installations," "Defining Environmental Security: Implications for the U.S. Army," "Interagency Cooperation on Environmental Security," and "Mending the Seams in Force Protection: From the Pentagon to the Foxhole." These publications and others may be ordered from AEPI. *For more information, contact:* Director, AEPI, 101 Marietta St., Suite 3120, Atlanta, GA 30303; *Tel:* 404/524-9364; *Fax:* 404/524-9368; *Email:* mlulofs@aepi.army.mil; *Internet:* http://www.aepi.army.mil/

REORGANIZATION AT USAID TAKES SHAPE

A May 2001 press release entitled "The Four Pillars of USAID" outlined the reorganization plans of new U.S. Agency for International Development Administrator Andrew Natsios. The excerpts below describe the new pillars: (1) the Global Development Alliance, (2) Economic Growth and Agriculture, (3) Global Health, and (4) Conflict Prevention.

"In order to improve USAID's effectiveness as a key foreign policy instrument, this Administration intends to coordinate and focus Agency resources and capabilities to address globalization and conflict. USAID will bring together programs and activities into three program pillars that cut across all USAID funding accounts. By aggregating current and new programs that are mutually reinforcing into these pillars, USAID will be able to use scarce budget and human resources more effectively, and to describe its programs more clearly.

The Global Development Alliance (GDA)
"The Global Development Alliance (GDA) is USAID's commitment to change the way we implement our assistance mandate. We propose to serve as a catalyst to mobilize the ideas, efforts, and resources of the public sector, corporate America, the higher education community, and non-governmental organizations in support of shared objectives. For example, a critical development need is to help poor countries have access to new information technologies, so they aren't left permanently off the digital highway.

Economic Growth and Agriculture
"More than 1.2 billion people live on less than a dollar a day; more than 800 million people continue to go to bed hungry; and more than 113 million children are not in school. The Economic Growth and Agriculture pillar will strengthen U.S. efforts to ensure that these people are able to take advantage of the potential of globalization, rather than becoming its victims. It highlights the interrelationship and interdependence of economic growth and agricultural development, environmental sustainability, and the development of a country's human capital—with the ultimate goal of creating and cultivating viable market-oriented economies.

(continued)

Programs in this pillar will encourage economic opportunity, agricultural development, education and training, and effective management of natural resources.

Global Health

"USAID intends to include in this pillar maternal and child health, nutrition, women's reproductive health, HIV/AIDS, and programs that address other infectious disease such as malaria and tuberculosis. These are global issues with global consequences: the health of a population directly affects their productivity, and unchecked infectious diseases in other countries pose threats to our own.

Conflict Prevention and Developmental Relief

"USAID continues to stand at the forefront of agencies around the world in its ability to respond to man-made and natural disasters. The request will enable USAID to maintain this capability to provide needed help rapidly when international emergencies occur. This initiative will integrate the existing portfolio of USAID democracy programs with new approaches to crisis and conflict analysis, and new methodologies to assist conflicting parties resolve their issues peacefully. Our experience has proven that by promoting and assisting the growth of democracy—by giving people the opportunity to peacefully influence their government—the United States advances the emergence and establishment of societies that will become better trade partners and more stable governments. By facilitating citizens' participation and trust in their government, our democracy efforts can help stop the violent internal conflicts that lead to destabilizing and costly refugee flows, anarchy and failed states, and the spread of disease."

U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID)

The U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) leads the Department of Defense's medical research for defenses against biological warfare. USAMRIID studies naturally occurring infectious diseases requiring special containment, such as anthrax, plague, and hemorrhagic fevers. Its scientists develop vaccines, drugs, and diagnostics for laboratory and field use, as well as generating strategies, information, procedures, and training programs for medical defense against biological threats. The Institute is the only DoD laboratory capable of handling highly dangerous viruses at Biosafety Level 4. Although USAMRIID mainly focuses on protecting military personnel and preserving fighting strength, its research contributes to overall scientific knowledge and global health. The Institute works with the U.S. Centers for Disease Control and Prevention, the World Health Organization, and academic research centers worldwide. In addition, USAMRIID operates a world-renowned reference laboratory for definitive identification of biological threat agents and diagnosis of the diseases they produce. *For more information, contact:* Commander, USAMRIID, Attn: MCMR-UIZ-R, 1425 Porter St., Fort Detrick, Frederick, MD 21702-5011; *Email:* USAMRIIDweb@amedd.army.mil; *Internet:* www.usamriid.army.mil/

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Global Programs, International Research Institute for Climate Prediction (IRI)

The concept of an International Research Institute for Climate Prediction (IRI) (http://www.cip.ogp.noaa.gov/) was first presented by the United States (in the first Bush Administration) at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 1992, and further advanced by the U.S. (Clinton Administration) at the International Forum on Forecasting El Niño: Launching an International Research Institute, in Washington, DC, 1995. It was agreed that the IRI would embody an "end to end" capability for producing experimental climate forecasts based on predicting ENSO phenomena, and generating information that could be

incorporated by decision makers worldwide to mitigate climate-related impacts in sectors such as agriculture, water management, disaster relief, human health and energy.

The first real world test of this initiative occurred during the 1997-98 El Niño event, the cost of which was estimated to be 22,000 lives lost and $34 billion in damages worldwide. Because of ongoing efforts, IRI and NOAA were well-positioned to rapidly organize climate research and application activities with international and regional partners in Latin America, the Caribbean, Southern Africa, Southeast Asia, South Asia, and the United States.

For more information, contact: Jim Buizer, Assistant Director for Climate and Societal Interactions, Office of Global Programs (NOAA/OGP), 1100 Wayne Ave., Ste. 1225, Silver Spring, MD 20910; *Tel:* 301/427-2089-115; *Fax:* 301/427-2082; *Email:* buizer@ogp.noaa.gov; *Internet:* http://www.ogp.noaa.gov; *or* Kelly Sponberg, Manager, Climate Information Project; *Tel:* 301/427 2089-194; *Fax:* 301/427-2082; *Email:* sponberg@ogp.noaa.gov; *Internet:* http://www.cip.ogp.noaa.gov/; *IRI Web site:* http://iri.ldeo.columbia.edu/

U.S. Department of Defense/Environment
Environmental security initiatives at the Department of Defense have four major objectives: 1) to comply with the law; 2) to support U.S. military readiness by ensuring continued access to air, land, and water needed for training and testing; 3) to improve the quality of life of military personnel and their families; and 4) to contribute to the development of low-cost, high performance, environmentally friendly weapons systems. *For more information, contact:* U.S. Department of Defense, 3400 Defense Pentagon (Room 3E792), Washington, DC, 20301-3400; *Internet:* https://www.denix.osd.mil/

U.S. Department of Energy (DoE)
Office of Defense Nuclear Nonproliferation
Located within the Department of Energy's (DoE) National Nuclear Security Administration, the Office of Defense Nuclear Nonproliferation (a) promotes nuclear nonproliferation, (b) attempts to reduce global dangers from weapons of mass destruction, (c) advances international nuclear safeguards, and (d) supports the elimination of inventories of surplus fissile materials that can be used in nuclear weapons. The Office directs development and coordination of DoE positions, policies, and procedures relating to international treaties and agreements. It also provides technical expertise and leadership to an international program for global nuclear safety and conducts research and development for treaty monitoring. *For more information, contact:* Sarah Lennon (SARAH_LENNON@hq.doe.gov). *Internet:* www.nn.doe.gov/index.html

Office of Environmental Management (EM)
The Office of Environmental Management (EM) interacts with foreign governments, international corporations, and international regulatory and consensus standards bodies. Principle topic areas include: characterization, handling, transport, and storage or nuclear and chemical wastes; addressing the decontamination and decommissioning of nuclear facilities; developing systems with foreign partners to ensure proper control, monitoring, and return of foreign spent fuel provided under the 1950s "Atoms for Peace Program." EM's international agreements allow the United States to obtain unique technical capabilities and engage in exchanges of scientific and technical data and expertise unavailable from U.S. experience, such as comparative designs of waste storage systems.

U.S. Director of Central Intelligence/DCI Environment and Societal Issues Center
The DCI Environmental and Societal Issues Center is the new name for the DCI Environment Center (DEC), which was established in 1997 as a focal point for all intelligence community activities on environmental matters. Housed in the Directorate of Intelligence, the Center produces, integrates, and coordinates assessments of the political, economic, and scientific aspects of environmental and societal issues as they pertain to U.S. interests. The Center also provides data to the environmental community. Specific Center programs include: assessing transboundary environmental crime, supporting environmental treaty negotiations and assessing foreign environmental policies, assessing the role played by the environment in country and regional instability and conflict, supporting the international

environmental efforts of other U.S. government agencies, and providing environmental data to civil agencies. Check the ECSP Web site for updates on the expanded activites of the Center relating to societal issues.

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)/ CENTER FOR POPULATION, HEALTH AND NUTRITION

The Center for Population, Health and Nutrition's (PHN) goals are to stabilize world population growth and to protect human health. In order to achieve these goals, the Agency has adopted a strategy based on four strategic objectives: reducing unintended pregnancies, reducing maternal mortality, reducing infant and child mortality, and reducing STD transmission with a focus on HIV/AIDS. These are a refinement of the historical strategic direction of the Population, Health and Nutrition sector. Looking to the future, the PHN strategy also incorporates principles from the Cairo Program of Action and reflects Agency mandates in the areas of women's empowerment. The PHN program focus, therefore, is on improving the quality, availability, and use of key family planning, reproductive health, and other health interventions in the PHN sector, with sustainability and program integration as essential crosscutting themes. For over thirty years USAID has supported PHN activities through a variety of programs in many countries.

The PHN Center is composed of three offices with complementary objectives and activities: the Office of Population, the Office of Health and Nutrition, and the Office of Field and Program Support. Each office, its divisions, and activities are described below.

Office of Population (POP)
Commodities and Logistics Management Division (CLM): Provides a centralized system for contraceptive procurement, maintains a database on commodity assistance, and supports a program for contraceptive logistics management.

Communications, Management, and Training Division (CMT): Increases the awareness, acceptability, and use of family planning methods and expands and strengthens the managerial and technical skills of family planning and health personnel.

Family Planning Services Division (FPSD): Increases availability and quality of family planning and related services through strengthening government programs, local private voluntary organizations, for-profit organizations, and commercial channels.

Policy & Evaluation Division (P&E): Collects and analyzes family planning and other reproductive health information; improves the policy environment for family and reproductive health services; and strengthens methodologies for evaluation of family planning and reproductive health programs.

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Research Division (R): Supports biomedical research to increase understanding of contraceptive methods and to develop new fertility regulation technologies. Also, through operations research, the Research division seeks to improve the delivery of family planning and reproductive health services.

Office of Health and Nutrition (HN)

Child Survival Division (CS): Provides technical guidance and assists in strategy development and program implementation in child survival, including interventions aimed at child morbidity and infant and child nutrition.

Nutrition and Maternal/Infant Health Division (NMH): Provides technical guidance and assists in strategy development and program implementation in nutrition and women's health and the health of the newborn.

Health Policy and Sector Reform Division (HPSR): Assists in the design, implementation, research, and evaluation of health and nutrition policy reform, management and financing issues, including health care financing, quality assurance, pharmaceuticals, private sector, and data activities.

Environmental Health Division (EH): Assists in the design, implementation, research, and evaluation of environmental health activities and issues, including water and sanitation, hazardous wastes, vector-borne tropical diseases, food hygiene, solid waste, air pollution, and occupational health.

HIV/AIDS Division (HIV-AIDS): Provides technical guidance and assists in strategy development, program design, and implementation of HIV/AIDS control activities worldwide.

Office of Field and Program Support (OFPS)

The Office of Field and Program Support (OFPS) was created as a demand driven, service-oriented unit within the PHN Center to ensure that state-of-the-art technical direction is translated into field strategies and programs which achieve impact both globally and at the country level. OFPS has two major functions:

Field Support: Coordinates the country teams, which consist of a country coordinator and resource persons for each country included in the Joint Planning and Programming Country Strategy. The Office works with the Global Bureau, Regional Bureaus, and other donors and the field, providing significant technical input into strategic planning and performance monitoring.

Program Support: Carries out programming and budgeting for the Center, personnel management, and other tasks related to the global management of PHN resources.

The PHNC and the Missions have developed and implemented the Joint Programming and Planning Country Strategy (JPPC). JPPC is a framework that identifies priority countries for the PHN sector and
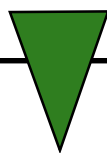
establishes mechanisms to maximize access to resources for the highest priority countries. The joint programming and planning process brings together staff from all areas at USAID to plan the effective allocation of resources in order to achieve the objectives of country programs. Within the JPPC strategy, Joint Programming Countries are those with the highest potential for worldwide, as well as local or regional, impact across sectors in the PHN arena. A significant level of USAID resources, both in terms of technical staffing and field support, will be committed to achieving results in these countries. Joint Planning Countries are other sustainable development countries that are lower priority in terms of global impact but have PHN sector activities in the form of bilateral programs. Although relatively fewer resources are committed to them than to Joint Programming countries, Joint Planning Countries still receive support from USAID. These countries may also access PHN technical resources. Certain countries are termed special circumstance countries because of significant investments made to date, policy considerations, or crisis conditions. USAID is committed to developing and maintaining strong responsive relationships with these countries and to support their initiatives in the PHN sector. One of the important lessons learned over the thirty years of USAID's efforts in the PHN sector is that maintaining a close connection between field implementation and technical innovations is critical to achieving a lasting impact.

USAID's PHN technical staff offers "one-stop shopping" to USAID's field missions. In this capacity, the PHNC has developed projects that provide access to state-of-the-art technical assistance through a network of Cooperative Agreements (CAs) and contractors. The PHNC also works with missions to translate global initiatives to country-specific situations and provides a ready mechanism by which missions can benefit from the experience and knowledge that USAID has gained worldwide. Working closely with Missions, USAID is developing new approaches for the changing needs of the PHN sector. USAID maximizes the global impact of its programs through support for effective strategic planning at the country level and the allocation of resources across country programs.

At the time of this writing, USAID is in the midst of reorganizing. At the end of this process, the PHNC will become the Bureau for Global Health.

For more information, contact Office of Population, USAID, Ronald Reagan Bldg. G-PHN-POP Rm 3.06 -041U, Washington, DC 20523. *Tel:* 202-712-0867; *Fax:* 202-216-3404; *Internet:* http// www.info.usaid.gov/pop_health.

U.S. Environmental Protection Agency (EPA): Office of International Activities

Through its Office of International Activities (OIA), the EPA works with other countries on the entire range of international environmental issues such as climate change, protection of marine environments, lead phase-out, and international transport of hazardous waste. Among other functions, OIA provides leadership, analysis, and coordination of Agency positions on major international issues such as marine pollution, the environment, and trade; it also coordinates with international policy bodies, including the North American Commission for Environmental Cooperation and the World Trade Organization. OIA also develops and implements international technical assistance and designs innovative programs on global environmental challenges such as transboundary pollution and marine pollution. Among the four OIA offices are the Office of International Environmental Policy, the Office of Technology

Cooperation and Assistance, and Office of Western Hemisphere and Bilateral Affairs. *For more information, contact:* Environmental Protection Agency, Mail Code 2660R, 1300 Pennsylvania Avenue, NW, Washington, DC 20460; *Tel:* 202/564-6462; *Internet:* www.epa.gov/oia/

U.S. Institute of Peace

The U.S. Institute of Peace is an independent, nonpartisan institution created and funded by Congress that provides scholarships, intensive teaching seminars, research resources, and curriculum materials to educators, students, scholars, international affairs practitioners, and members of the public who want to understand the complexities of international conflicts and approaches to peace. The Institute also runs a training program to help government officials, military and police personnel, international organization representatives, and employees of non-governmental organizations— both American and international—improve their conflict management skills. It also offers financial support for research, education, and training, and the dissemination of information on international peace and conflict resolution. *For more information, contact:* United States Institute of Peace, Grant Program, 1200 17th Street NW, Suite 200, Washington, DC 20036-3011; *Tel:* 202/429-3842; *Fax:* 202/429-6063; *Email:* grant_program@usip.org; *Internet:* http:// www.usip.org/

White House Office of Science and Technology Policy (OSTP)/National Security and International Affairs

The White House Office of Science & Technology Policy (OSTP) advises the President on science and technology priorities that support national needs; leads interagency coordination of the federal government's science and technology enterprise; and fosters partnerships with state and local governments, industry, academe, nongovernmental organizations, and the governments of other nations. One of the principal priorities of OSTP is strengthening the contribution of science and technology to national security and global stability. OSTP's national security priorities include: nuclear materials security, nuclear arms reduction, and nonproliferation of weapons of mass destruction. Commerce-security priorites range from sustainable development to information security. The OSTP supports U.S. goals through international engagement and the use of science and technology to address global threats, science capacity building, and economic growth. *For more information, contact:* Office of Science and Technology Policy, Executive Office of the President, Washington, DC 20502; *Tel:* 202/395-7347; *Email:* ostpinfo@ostp.eop.gov; *Internet:* http://www.ostp.gov

INTERGOVERNMENTAL ACTIVITIES

Food and Agriculture Organization of the United Nations (FAO)

Founded in 1945, the Food and Agriculture Organization of the United Nations (FAO) was set up with a mandate to raise levels of nutrition and standards of living; to improve agricultural productivity; and to better the condition of rural populations. The main goal of FAO is to alleviate poverty and hunger by promoting agricultural development, improved nutrition, and the pursuit of food security—defined as the access of all people at all times to the food they need for an active and healthy life. FAO provides independent advice on agricultural policy and planning, and on the administrative and legal structures needed for development. The organization also advises developing countries on strategies for rural development, food security, and the alleviation of poverty. In addition, it gives practical help to developing countries through a wide range of technical assistance projects. FAO collects, analyzes, interprets, and disseminates information relating to nutrition, food, agriculture, forestry, and fisheries and provides a neutral forum where all nations can meet to discuss and formulate policy on major food and agriculture issues. *For more information, contact:* The Food and Agricultural Organization of the United Nations, Viale delle Terme di Caracalla, 00100 Rome, Italy; *Tel:* 39 06 5705 1; *Fax:* 39 06 5705 3152; *Email:* FAO-HQ@fao.org; *Internet:* http://www.fao.org/

Global Monitoring for Environment and Security (GMES)

Global Monitoring for Environment and Security (GMES) is part of the European Space Agency (ESA) and European Commission (EC) joint document on the European strategy for space. GMES links Europe's political requirements to the advanced technical capacities of observation satellites. Both the ESA Council and the EU

Research Council adopted GMES resolutions in November 2000. By combining the technical strengths of Europe, GMES will aid in studying global change (global warming, deforestation, resource scarcity); mitigating and preventing environmental disasters (both man-made and natural); and will provide support for peacekeeping operations. However, this program is still in development. The EU Research Council has requested specific implementing proposals by June 2001. *For more information, contact:* Internet: http://gmes.jrc.it

Joint United Nations Programme on HIV/AIDS (UNAIDS)

The Joint United Nations Programme on HIV/AIDS (UNAIDS) is a leading advocate for worldwide action against HIV/AIDS. The global mission of UNAIDS is to lead, strengthen, and support an expanded response to the epidemic that will: prevent the spread of HIV; provide care and support for those infected and affected by the disease; reduce the vulnerability of individuals and communities to HIV/AIDS; and alleviate the socioeconomic and human impact of the epidemic. The UNAIDS Secretariat, based in Geneva, Switzerland, operates as a catalyst and coordinator of action on AIDS, rather than as a direct funding or implementing agency. UNAIDS is guided by a Programme Coordinating Board with representatives of 22 governments from all parts of the world, representatives of the 7 UNAIDS Cosponsors, and 5 representatives of nongovernmental organizations, including associations of people living with HIV/AIDS. UNAIDS is the first United Nations program to include NGOs in its governing body. The Cosponsors and Secretariat also meet several times a year as the Committee of Cosponsoring Organizations (CCO). *For more information, contact*: UNAIDS, 20 avenue Appia, CH-1211 Geneva 27, Switzerland; *Tel:* 4122 791 3666; *Fax:* 4122 791 4187; *Email:* unaids@unaids.org; *Internet:* http://www.unaids.org/

NATO Science Programme

The NATO Science Programme offers support for international collaboration between scientists from countries of the Euro-Atlantic Partnership Council (EAPC). The mission of the NATO Science Programme is dedicated to support for collaboration between scientists in Partner countries or Mediterranean Dialogue countries and scientists in NATO countries. The Science Programme is divided into four broad categories: 1) providing science fellowships for NATO's partner countries, 2) establishing personal links between scientists of the NATO and Partner or Mediterranean Dialogue countries, 3) supporting partner countries in structuring the organization of their research programs, and 4) researching applications for industrial purposes and addressing environmental concerns in partner countries. The Committee on the Challenges of Modern Society (CCMS), established in 1969, aims to attack practical problems already under study at the national level and, by combining the expertise and technology available in member countries, arrive fairly rapidly at valid conclusions and to make recommendations for action to benefit all. Areas covered by CCMS include environmental security, public health, and quality of life and planning. *For more information, contact:* NATO Headquarters, Blvd Leopold III, 1110 Brussels, Belgium; *Email:* natodoc@hq.nato.int; *Internet:* http://www.nato.int/

United Nations Development Programme (UNDP)

Through a unique network of 134 country offices, the United Nations Development Programme (UNDP) helps people in 174 countries and territories to help themselves, focusing on poverty elimination, environmental regeneration, job creation, and the advancement of women. In support of these goals, UNDP is frequently asked to assist in promoting sound governance and market development and to support rebuilding societies in the aftermath of war and humanitarian emergencies. UNDP's overarching mission is to help countries build national capacity to achieve sustainable, human development, giving top priority to eliminating poverty and building equity. Headquartered in New York, UNDP is governed by a thirty-six member Executive Board, representing both developing and developed countries. The 1999 UNDP Human Development Report outlined a detailed definition of human security and proposed measures to address insecurities. *For more information contact:* UNDP, One United Nations Plaza, New York, NY, 10017; *Tel:* 212/906-5315; *Fax:* 212/906-5364; *Email:* hq@undp.org; *Internet:* http://www.undp.org

United Nations Environment Programme (UNEP)

The mission of the United Nations Environment Programme (UNEP) is to provide leadership and encourage partnerships in caring for the environment by inspiring, informing, and enabling nations and people to improve their

quality of life without compromising that of future generations. UNEP was established as the environmental conscience of the United Nations system and has been creating a basis for comprehensive consideration and coordinated action within the UN on the problems of the human environment. Recognizing that environment and development must be mutually supportive, UNEP advocated a concept of environmentally sound development, which later led to the adoption of the "Sustainable Development" concept in the Brundtland Commission Report and the *United Nations Perspective Document for the Year 2000 and Beyond*. Other notable projects include Managing Water for African Cities, an International Children's Conference, and a Convention on International Trade in Endangered Species. Dr. Klaus Toepfer is the director of UNEP. *For more information contact:* Mr. Tore J. Brevik, Chief, Information and Public Affairs, UNEP, United Nations Avenue, Gigiri, P.O. Box 30552, Nairobi, Kenya; *Tel:* 254-2-62-1234; *Fax:* 254-2-62-4489/90; *Email:* ipainfo@unep.org; *Internet:* http://www.unep.org

United Nations International Fund for Agricultural Development (IFAD)

The International Fund for Agricultural Development (IFAD), a specialized agency of the United Nations, was established as an international financial institution in 1977 as one of the major outcomes of the 1974 World Food Conference. The Conference was organized in response to the food crises of the early 1970s that primarily affected the Sahelian countries of Africa. IFAD was created to mobilize resources on concessional terms for programs that alleviate rural poverty and improve nutrition. Unlike other international financial institutions, which have a broad range of objectives, IFAD focuses on combating hunger and rural poverty in developing countries. The Fund supports projects that are geared toward poverty reduction and fine-tuning human resource and management systems of rural sector projects. *For more information, contact:* The International Fund for Agricultural Development, Via del Serafico, 107 - 00142 Rome, Italy; *Tel:* 39-0654591; *Fax:* 39-065043463; *Email:* ifad@ifad.org; *Internet:* http://www.ifad.org/

United Nations Population Fund (UNFPA)

The United Nations Population Fund (UNFPA) is the lead UN body in the field of population. UNFPA extends assistance to developing countries, countries with economies in transition, and other countries at their request to help them address reproductive health and population issues. The organization also raises awareness of these issues in all countries, as it has since its inception. UNFPA's three main areas of work are: to help ensure universal access to reproductive health, including family planning and sexual health, to all couples and individuals on or before the year 2015; to support population and development strategies that enable capacity-building in population programming; and to promote awareness of population and development issues and advocate for the mobilization of the resources and political will necessary to accomplish its areas of work. The Executive Director of UNFPA is Dr. Thoraya Ahmed Obaid. Ongoing projects of note include a project to empower women and goodwill ambassadors for promoting women's reproductive health issues. *For more information contact:* United Nations Population Fund, 220 East 42nd Street, New York, NY 10017; *Tel:* 212/297-5020; *Fax:* 212/557-6416; *Email:* ryanw@unfpa.org; *Internet:* http://www.unfpa.org

World Food Programme (WFP)

The World Food Programme (WFP) is the frontline United Nations organization whose mission is to fight world hunger. WFP has emergency and development projects in 82 countries worldwide and a staff of more than 5,000, over half of whom are employed on a temporary basis. WFP's budget is voluntary and based on performance, linked to the tonnage of food it moves. Contributions—either in cash, commodities, or services—to WFP come from donor nations, inter-governmental bodies such as the European Union, corporations, and individuals. WFP also buys more goods and services from developing countries, in an effort to spur their economies, than any other U.N. agency. **For more information, contact: World Food Programme, Via Cesare Giulio Viola, 68 Parco dé Medici**, **Rome 00148, Italy; Tel:** 39 06 6513; *Fax:* 39 06 6590 632; **Internet:** http://www.wfp.org/

World Health Organization (WHO)

The mission of the World Health Organization (WHO) is the attainment by all peoples of the highest possible level of health. Health, as defined in the WHO constitution, is a state of complete physical, mental, social well-being and not merely the absence of disease or infirmity. In support of its main objective, the organization has a wide range of

functions, including the following: to act as the directing and coordinating authority for international health; to promote technical cooperation; to assist governments, upon request, in strengthening health services; and to promote and coordinate biomedical and health services research. Dr. Gro Harlem Brundtland, WHO Director-General, has been a key figure in the integration of environment, population, health, and security issues. *For more information, contact:* WHO, Avenue Appia 20, 1211 Geneva 27, Switzerland; *Tel:* 41-22-791-2111; *Fax:* 41-22-791-0746; *Email:* info@who.int; *Internet:* http://www.who.int

WENGEN – 2001
International Workshop on Environmental Change :
Implications for Population Migrations

Hotel Regina
Wengen, Switzerland, September 19-22, 2001

Background Issues

Environmental change in general, and climatic change in particular, are likely to impact significantly upon resources such as water and agriculture, transforming present-day landscapes and their ecologies. As a consequence, we can expect disruptions of socio-economic activities in sensitive regions of the globe. Agriculture is at particular risk, especially in areas where prolonged droughts, sea level rise, enhanced natural hazards, or extreme meteorological events such as floods or mudslides threaten marginal existence. Conversely, large-scale movements of people, goods or capital may also disrupt local environments and further contribute to social problems.

A wide range of factors and processes with both natural and social causes can have widespread impacts, including:

·   Air pollution and ozone depletion
·   Climatic change
·   Land degradation
·   Deforestation
·   Desertification
·   Loss of biological diversity
·   Fresh water availability
·   Hazardous wastes
·   Direct and indirect consequences of human infrastructure, e.g., dams
·   Settlements within high-risk zones (e.g., flood-plains, semi-arid regions)
·   Inadequate resource management

One of the direct or indirect effects of global environmental change that is increasingly recognized today is forced migration. One such example includes sea-level rise, whereby populations will be forced to move out of low-lying coastal zones or islands. Migrations can also be triggered when essential resources such as water or food fall below critical thresholds in a given region. In addition, environmental causes can be combined with social causes such as large-scale warfare, civil war, political conflicts, and disputes over resources to produce refugee flows. Social disruption can in itself be at the root of environmental degradation which then eventually leads to massive out-migration. Various studies in recent years suggest that if environmental change is to be of the projected magnitude and rapidity, then there could be as many as 150 million "environmental refugees" by the end of the 21st Century (even if this term is, for the moment, not recognized either legally or institutionally). In view of the current barriers to migration in most parts of the world, the social, economic and political consequences of migration at these scales is far from trivial. Most governments are today ill-equipped in legislative terms to deal with this type of situation. The political and economic tensions that will be raised by an increasing number of refugees could lead to conflictual situations in many regions. When investigating the interdisciplinary nature of the problem, it should be stressed that because of the subtle interactions between environmental and economic issues, it becomes difficult to separate different drivers of migration, i.e., political, environmental, economic, ethnic, etc.

(continued from previous page)

Wengen-2001 Workshop: Workshop Topics and Call for Papers

With these issues in mind, an interdisciplinary meeting in the series «International Workshops on Global Change Research» will be held in Wengen (Bernese Alps, Switzerland) from September 19-22, 2001.

Topics which will be addressed through a number of keynote addresses and supporting papers include:

· Environmental change issues: state of our understanding of current issues and probable trends into the future: climate, deforestation, desertification, freshwater resources, biodiversity, land degradation, etc.
· Causes of migration related to environmental change issues: food security, access to water, land-use and land-cover change, etc.
· Causes of migration related to economic changes: urbanization, industrialization, shifting agricultural markets, etc.
· Social driving forces: population growth, poverty, etc.
· Migration-induced environmental changes
· Regional case studies (e.g., small island states, arid zones, mountain regions, etc.)
· Potential for conflict and conflict resolution
· Equity issues; beneficiaries of international relief
· Political strategies for managing migration
· Sensitivity of agriculture to climate change
· Urbanization and population concentration

Supporting papers are thus being sought in these various fields. A short Abstract (maximum 1 A-4 page) should reach the meeting coordinator by April 20, 2001, preferably in electronic form, at the following address:

Professor Martin Beniston
Director
Department of Geography
University of Fribourg
Perolles
CH-1700 Fribourg
Switzerland
E-Mail: Martin.Beniston@Unifr.CH

BIBLIOGRAPHIC GUIDE TO LITERATURE

The guide lists by theme literature that has come to the attention of ECSP in the past year on population, environmental change, and security issues. ECSP will publish a comprehensive bibliography for the literature in late 2001 under a separate cover. To request this comprehensive bibliography or to suggest a recently-published article or book not listed below, please contact us at 202/691-4182 or at lalaszrl@wwic.si.edu.

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