COMMENTARY

The Next Steps for Environment, Population, and Security

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GEOFFREY D. DABELKO

In 1994, interest in environment and security issues exploded. Civil unrest in Liberia, Rwanda, Somalia, and Haiti offered graphic illustrations of "state failure." Senior politicians, like U.S. Vice President Albert Gore, began to ask how these conflagrations might be related to natural resources. In academia, Canadian political scientist Thomas Homer-Dixon (1994) published the results of his investigations into environmental scarcity and acute conflict in the widely respected journal *International Security*. His Swiss counterpart Günther Baechler undertook the first round of the Environmental Conflicts Project (ENCOP) case studies. Critics in the global North and South took aim at these claims, spurring a lively debate (Conca, 1994; Dalby, 1994; Käkönen, 1994; Levy, 1995a, 1995b).

Robert Kaplan's influential 1994 piece in *The Atlantic Monthly,* "The Coming Anarchy," brought this research to a wider audience. Kaplan's breathless claim, based on his travels in West Africa, that environment would become *the* national security issue of the 21st century grabbed newspaper headlines and shot to the top of policymakers' agendas. Citing Kaplan's piece and political instability in West and East Africa, Gore created the State Failure Task Force to investigate these collapses, mandating that the analyses fully integrate environmental and demographic variables.[1]

Kaplan's hyperbolic comparison of Homer-Dixon's ideas to George Kennan's influential "X article"[2] on Soviet containment raised the ire of many old hands (and did few favors for Homer-Dixon or the nascent field). Environmental security was not all-encompassing enough to provide a new template for international affairs, as some hoped. That same year, the United Nations threw its hat into the ring with "human security," which focused attention on the individual person, who is usually neglected under state-centered definitions of security (United Nations Development Programme, 1994). But these concepts only supplemented, not replaced, traditional frameworks of development and security.

Founded by P.J. Simmons in 1994, the Woodrow Wilson Center's Environmental Change and Security Project (ECSP) waded through post-Cold War struggles to redefine security in order to understand the environment's role in conflict. ECSP offered Washington policymakers a neutral, nonpartisan forum where odd bedfellows—army generals and conservation biologists, demographers and CIA analysts—could learn from one another. Heads of state and directors of UN agencies, untenured post-docs and field workers: ECSP brought together everyone trying to trace the complex links among environment, population, and security, and devise effective policies and programs for the field.

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After 10 years of multisectoral, multidisciplinary cross-pollination, where are we now? What are the key questions and themes for the next decade? For this 10th issue of the *ECSP Report*, we asked six scholars, practitioners, and policymakers to offer their recommendations for the future of environmental security.

Eminent scientist and Pulitzer Prize-winning author Jared Diamond connects environmental degradation to societal failure, and offers steps that any of us—scholar, policymaker, or consumer—can take to promote sustainable development and reduce the threat of political collapse. Former European Commission environment official Margaret Brusasco-Mackenzie laments the loss of momentum that pushed environmental security and sustainable development forward in the heady rush of the early nineties. She highlights some of the European Union's efforts to reinvigorate these policies in a world dominated by "hard" security headlines.

Erika Weinthal of Tel Aviv University tackles the evolving concept of environmental peacemaking, utilizing examples from the Middle East and Central Asia to promote the potential of environmental paths for reaching peace—and keeping it. Richard Cincotta builds on Population Action International's influential report *The Security Demographic* to outline concrete steps for research and policy to untangle the significant correlations between demography and security. Both a scholar and an advocate, Cincotta presents a compelling case for why the foreign and security policy community must seriously consider demographic dynamics such as demographic transition theory, youth bulges, and migration.

Roger-Mark De Souza of the Population Reference Bureau points out that while population-health-environment (PHE) programs have enjoyed some success in the field, they are endangering that success by not effectively communicating the advantages of these approaches. Without systematically documenting and advertising the benefits of integrating PHE, programs will not receive the support of policymakers and donors in both the developing and developed worlds. Finally, Richard Matthew and Bryan McDonald of the Center for Unconventional Security Affairs at the University of California, Irvine, apply lessons from environmental security research to develop their concept of a broader network of threats and vulnerabilities that they believe constitutes a new 21st century security agenda.

Environment, Development, and Sustainable Peace

To these worthy ideas, I would add a few priorities. As scholars, we must identify the pieces missing from the environment, conflict, and cooperation puzzle and examine the gaps that inhibit political responses. We must move beyond the false dichotomy between scarcity and abundance. We must push forward with the growing effort to invert the conflict thesis and look at environmental pathways to confidence building and peacemaking. In *Environmental Peacemaking,* Ken Conca and I (2002) presented case studies, including one by commentary contributor Erika Weinthal, to spur the conversation and spark interest in these mechanisms; however, the research community has yet to trace the pathways, examine a significant set of cases, and evaluate relative success. In many ways, academia is just catching up to the policy world, where organizations as diverse as local NGOs, the World Bank, and the U.S. military have engaged in environmental peacemaking.[3]

But policymakers must act fast to avoid missing opportunities to build peace. Instead of merely reacting to the symptoms of environment-conflict linkages, they should proactively extinguish hotspots by bolstering confidence and building cooperation. As Alexander Carius and I outlined in *Understanding Environment, Conflict, and Cooperation*, published by the United Nations Environment Programme (UNEP) in 2004, institutions need to bridge disciplinary borders between academia and policy, reduce compartmentalization among their

departments, balance participation by elite-level and broad-based stakeholders, and improve the ways in which policies are communicated, perceived, and justified.

Population is often on the other side of the disciplinary boundary, even though it is an integral variable. ECSP has sought to draw population out of its political and theoretical isolation and into the mainstream of environmental security research and policy. Population and environment organizations, offices, and researchers do not spend enough time engaging each another, partly due to fears that population is a political scarlet letter and environment is a marginal issue. Some may find focusing on population growth in the developing world exploitative, xenophobic, or hypocritical, given the impact of Northern consumption on resources. Yet, pretending demography is disconnected from environment and security misrepresents reality and excises an effective avenue for understanding environment, conflict, and cooperation.

Just as we cannot ignore demography, it is equally shortsighted not to investigate how livelihoods, poverty, and resource use are related to conflict. As UNEP Executive Director Klaus Toepfer told ECSP (2004), "Sustainable development is a security imperative. Improving degraded environments and achieving sustainable development enhances human security, prevents conflict, and builds peace." Environmental security has come late to these issues, but our Southern colleagues' ever-louder calls for placing the issues within a development context will help address this shortcoming.

Just as the field of environmental security must better take account of the development imperative that drives policy in the global South, so too must it tackle consumption and the role of the global economy. Local conflicts in the developing world are often related to global patterns of resource use, and therefore we must factor them into our equations more explicitly. Examining how Northern consumption exacerbates climate change, for example, could add nuance to a discussion dominated by doomsday scenarios that drown out practical ideas for action.

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Planting Trees, Making Peace

When I learned that environmental activist Wangari Maathai of Kenya had been awarded the Nobel Peace Prize in recognition of her decades-long fight to protect Kenya's forests from corruption and degradation, I was overjoyed—it was the best 10th anniversary present ECSP could receive. Maathai's Green Belt Movement planted 30 million trees across the country, and in the process, employed thousands of women and offered them empowerment, education, and even family planning.[4] Maathai firmly believes that environmental protection is inextricably linked to improving human living conditions. As she told Norway's TV2, "If we improve the management of our natural resources, we help promote peace."

Awarding the peace prize to an environmental activist certainly raised eyebrows. Some accused the Nobel Committee of straying too far from the traditional concept of peace. According to these naysayers, the committee should not expand its view of war and peace to include local livelihood conflicts that emerge from natural resource exploitation, corruption, constrained public participation, maldevelopment, and inequity.

But the struggle over natural resources fuels conflicts across the world. "Maathai stands at

Wangari Maathai, 2004 Nobel Peace Prize Winner (credit: Goldman Environmental Prize)

the front of the fight to promote ecologically viable social, economic, and cultural development in Kenya and in Africa," said the Norwegian Nobel Committee (2004). "She represents an example and a source of inspiration for everyone in Africa fighting for sustainable development, democracy, and peace." The academic world should stop arguing over two sides of the same coin, and instead explore how livelihood security could encourage cooperation and prevent conflict. Policymakers and practitioners must rise above interagency squabbles and ineffective Band-Aid approaches, and instead pursue integrated and sustained efforts to redress the roots of conflict and promote environmental pathways to peace. As the Nobel Committee proclaimed, "Peace on earth depends on our ability to secure our living environment."

Notes

1. The State Failure Task Force is now known as the Political Instability Task Force. Its Phase III results are available on the website of the University of Maryland's Center for International Development and Conflict Management at http://www.cidcm.umd.edu/inscr/stfail/.

2. The "X article," originally a telegram sent by George Kennan to the U.S. Department of State in 1946, was published in *Foreign Affairs* in 1947 as "The Sources of Soviet Conduct"; see http://www.cnn.com/SPECIALS/cold.war/episodes/04/documents/x.html.

3. See Friends of the Earth Middle East's "Good Water Makes Good Neighbors Project" at http://www.foeme.org/water.htm; the work by the World Bank and UNDP to facilitate the Nile Basin Initiative, at http://www.nilebasin.org/; and the Arctic Military Environment Cooperation Programme, through which the United States, Norway, and Russia cooperatively address radioactive contamination in northwestern Russia, at https://www.denix.osd.mil/denix/Public/Intl/AMEC/declar.html.

4. See Dabelko (2004) for more information on Maathai's Nobel Peace Prize.

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Environment, Population, and Health: Strategies for a More Secure World

JARED DIAMOND

Globalization—the increasing interconnectedness of the modern world—has many consequences: cultural homogenization, such as the expansion of the English language; the spread of certain consumer products, like Coca-Cola, cars, and popular music; and economic interconnectedness, including the much-discussed overseas transfer of jobs. These consequences arouse strong feelings and emotional reactions, and sometimes, violent protests. The fundamental causes of globalization—more efficient communications and transport—are not going to change, but we can try to anticipate and control its consequences.

These facets of globalization seem new and unprecedented, and at first, we might think we have nothing to learn from history. In fact, history is full of examples of slower and spatially limited globalizations. A past society that appears to be the polar opposite of our globalized world, isolated Easter Island in the Pacific Ocean, encountered nearly fatal problems of population, environment, and health.

Easter Island's 11 clans depended on each other for food and other supplies, and to erect the island's famous statues. But after rampant population growth led to total deforestation, Easter Island collapsed in an epidemic of cannibalism. The population crashed, war broke out between the clans, and people began throwing down other clans' statues. By 1840, all of the statues that the islanders had erected at great effort had been thrown down, the government had been overthrown, their religion had collapsed, and 90 percent of the people were dead. By the 1870s, the island, which had originally supported 15,000 people, had only 111 inhabitants. Because Easter Island is isolated, it is the purest case in history of an ecological collapse uninfluenced by neighboring societies. There were no friends to offer help or enemies to march in. All 11 clans—all sharing resources in a mini-globalized world—fell together.

Easter Island is a metaphor for the modern world. When the Easter Islanders got into trouble, there was no place to which they could flee and no one whom they could summon to help because Easter Island was isolated in the middle of the Pacific Ocean. Similarly, if our modern society gets into trouble, there is no other planet from which we can seek help, and there is no other planet to which we are going to be able to flee. We are like Easter Island in the Pacific Ocean.

Our world is interconnected and interdependent, like Easter Island's 11 clans. Today, we face the same problems—loss of forests, fisheries, biodiversity, fresh water, and topsoil—that dragged down past societies. But for the first time in world history, we are producing or transporting toxic materials, greenhouse gases, and alien species. All these environmental problems are time bombs. The world is now on an unsustainable course, and these problems will be resolved one way or another, pleasantly or unpleasantly, within the next 50 years.

Jared Diamond is a professor of geography and physiology at the University of California, Los Angeles, and the Pulitzer Prize-winning author of the widely acclaimed *Guns, Germs, and Steel: The Fates of Human Societies.* His next book, *Collapse: How Societies Choose to Fail or Succeed,* will be published by Penguin in January 2005.

Countries that are overwhelmed by environmental problems tend to develop political and economic problems. Ask a politically naïve ecologist to name the countries with the worst environmental and overpopulation problems. The environmentalist would say they include Afghanistan, Burundi, Haiti, Indonesia, Iraq, Madagascar, Nepal, Pakistan, Philippines, Rwanda, and the Solomon Islands. And then ask a First World politician who does not care about the environment to name the world's trouble spots, and the politician would say they include Afghanistan, Burundi, Haiti, Indonesia, Iraq, Madagascar, Nepal, Pakistan, Philippines, Rwanda, and the Solomon Islands. The two lists are identical because of cause and effect: people in countries with severe population, environment, and health problems get desperate. If they have no hope, they turn to drastic things like civil war and terrorism and make trouble not only for themselves but also for other countries.

In short, globalization is more than the First World sending the Third World good things, like Coca-Cola and the Internet. Globalization can go in two directions: "They" can send "us" bad things, such as terrorism, illegal immigrants, and diseases like SARS, malaria, and Ebola. It also means us sending them bad things in return. When Easter Island collapsed around 1680, its collapse did not affect anybody else in the world and nobody knew about it. Today, no society can collapse without affecting other societies. And so now, out of self-interest, we are involved with every other society in the world.

What Can We Do?

Our current economic and political problems can be depressing. But I see hope for several reasons: first, all the problems that I have ticked off are problems that we caused. Every one of our problems—deforestation, overfishing, water scarcity, and toxic waste—is of our own making. Therefore, we can choose to stop causing them. Our success depends on a mix of small-scale, bottom-up solutions and large-scale, top-down solutions: individual steps to manage our shared resources and governmental actions to prevent degradation.

Second, economics is on our side. A public heath campaign to throttle the spread of tuberculosis and malaria would cost about $25 billion. That seems like a lot of money until you consider that the interventions in Afghanistan and Iraq cost $80 billion to $100 billion (and that does not include the tens or hundreds of billions for nation building and the subsequent military actions). It would be relatively cheap to solve the world's public health problems, which if left untreated, may ultimately lead to the explosions that cause us to send in our troops. For $25 billion, we could start solving the world's ultimate problems; instead, we have chosen to solve just the proximate problems in a few places. The Band-Aids cost much more than the antibiotic.

Third, an especially effective strategy for dealing with population problems is to empower women to plan the size of their families. I often hear the argument that we Americans have no business telling others how many babies they should have and therefore we should not "force" family planning on anyone. But this is ignorant: people in the Third World know much better than any American the consequences of large families—they do not have enough money to feed their children, buy them clothes and books, or send them to school. They want the means to control their family size. Our government does not even have to actively provide the means; all it has to do is step back and stop interfering with private organizations that want to provide it.

Finally, individuals and groups of individuals can address these major problems relatively cheaply if we choose to do so:

We can vote. In a democracy, the government's top-down actions result from the voters' bottom-up expressions of will. And some elections (as we have recently seen in the United States) are settled by small numbers of voters.

We can join groups that pool their resources effectively. We can give modest sums of money to highly leveraged organizations. For example, World Wildlife Fund (WWF) has an

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annual budget of $80 million to $120 million, which seems like a lot of money until you consider that it is supposed to address all of the world's environmental problems. However, WWF is highly leveraged; if you give $150, governments will chip in $1000. Therefore, your modest contribution to highly effective, highly leveraged organizations can make a big impact.

We can speak out on public policy matters. The great majority of academics are not only uninterested in speaking to the public, but also have reservations about it. They feel that if they speak to the public, it shows they are self-interested and no longer unbiased. It is also important to find people who are charismatic and well-known, such as Hollywood celebrities, and engage them. They are known by billions of people around the world and they could be effective messengers.

We can encourage and support collaborations between big businesses and environmental organizations. Some of the most powerful forces in the world today are big businesses, and unfortunately, some use that power in environmentally destructive ways. However, quite a few realize that it is much cheaper to solve environmental problems at the outset rather than wait for a billion-dollar disaster like the Exxon Valdez spill, the Bhopal chemical plant, the Buffalo Creek coal mine in West Virginia, and the Panguna copper mine in Papua New Guinea. For the last six years, I have been working in Chevron Texaco's oil fields in Papua New Guinea, in collaboration with WWF, because Chevron Texaco decided, after the 1969 Santa Barbara oil spill, that it would be cheaper to avoid oil spills than to clean them up. Another example: in 1993, a number of major logging companies got together with WWF to set standards for sustainable forestry and establish the Forest Stewardship Council to label consumer products. Similarly, six years ago, Unilever—the world's largest wholesaler of seafood products—became concerned that they were going to run out of seafood. Unilever collaborated with WWF to establish the Marine Stewardship Council, which sets standards for sustainable fishing.

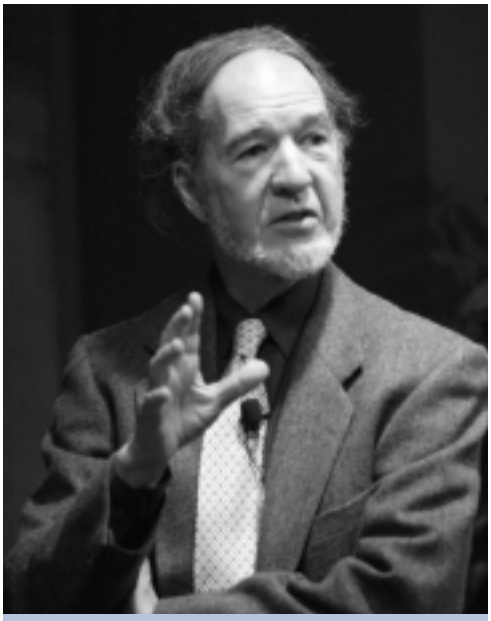
We can exercise consumer choice. We can punish companies that damage the environment and patronize those that adhere to environmental standards like sustainability pledges. For example, consumers can choose seafood from well-managed fisheries, such as Alaska's wild salmon. Or, consumers can vent their wrath over the Valdez spill by not buying Exxon gas. Knowing where to express your views is much trickier in the mining industry, because there is a series of steps between the mines and the consumer. Gold mining, for example, can be frightfully destructive, spilling cyanide into streams. Like most consumers, I do not have the faintest idea where the gold for my wedding ring was mined. But we can identify the part of the business chain that is susceptible to pressure and knows where the gold is mined. About two years ago, Tiffany's Jewelers—one of the 10 major gold retailers in the United States—realized that its stores were going to be picketed, so it switched its business to a clean mining company, BHP in Australia. In industries like mining and logging, we can trace the supply chain to figure out where consumers can most profitably use their limited clout.

Conclusion

We are the first society in human history that can learn from distant countries and the remote past. When we turn on our television sets, we

can see the consequences of ecological messes in Afghanistan and Baghdad and Somalia. We know what happened to Easter Island in 1680, the Anasazi in the southwestern United States in 1118, and the classic lower Mayan civilization in 810. We know about environmental disasters in the past and around the world, and we can choose to learn from these mistakes. The Easter Islanders, when their society was collapsing, did not know that Anasazi society had collapsed for the same reason 550 years before. We have the opportunity to learn; the Easter Islanders did not.

We are in the middle of an exponentially accelerating horse race. On one hand, the destructive forces in the world are increasing exponentially. On the other, the environmental movement is increasing exponentially. This horse race will be settled within the next 50 years, and it is up to you to influence which horse will win.



Jared Diamond (Credit: ©David Hawxhurst, Woodrow Wilson Center)

Editor's Note: This commentary is an edited transcript of an address Dr. Diamond gave at the Woodrow Wilson Center on January 30, 2004.

Environmental Security: A View From Europe

MARGARET BRUSASCO-MACKENZIE

Since the 1992 Conference on Environment and Development in Rio de Janeiro—and the founding of the Environmental Change and Security Project in 1994—much has changed, but unfortunately, not much for the better. At Rio, the world community signed up for a new economic model based on justice for all—including the world's poor—that would ensure sustainable development of both industrialized and less-industrialized nations. As Cold War tensions faded, a new field emerged that stretched the traditional definition of insecurity to encompass "soft" or "human" security issues like environmental degradation and scarcity of vital natural resources. While this redefinition gained credence in the 1990s within the foreign policy, development, and even defense communities, it is not widely recognized or precisely delineated. And since September 11, the overwhelming focus on homeland defense and the war on terrorism has almost completely eclipsed broader definitions of security.

In 2004, the United States allotted $36 billion for homeland security (Department of Homeland Security, n.d.) and more than *ten times* that for the military (Center for Defense Information, n.d.). Billions more have been spent by the rest of the "coalition of the willing" on the Iraq war. Contrast that with the $11.3 billion the United States spends on foreign aid each year (USAID, 2003) and the $54 billion to $62 billion needed annually to cut poverty in half by 2015 (Devarajan, Miller, & Swanson, 2002). Clearly, the new model of development—one that could ensure environmental security—has been put on the back burner by the hostilities in Iraq and the war on terrorism. Certain civil liberties in coalition countries have also been shoved aside by these wars, via the United States' Patriot Act and the United Kingdom's Anti-terrorism, Crime, and Security Act 2001. How can we go to war in the name of democracy and simultaneously encroach on our own (and foreigners') democratic rights? Despite these "wars," we have not achieved even limited security in the Middle East.

How do we get back on track? We must reinvigorate the comprehensive—and reject the exclusively militaristic—definition of security. Ten years after Rio, the 2002 World Summit on Sustainable Development in Johannesburg augmented several positive efforts towards sustainable development. The developed countries agreed to give more aid to developing countries, especially the least developed countries in Africa (via the Monterrey Commitments).[1] The members of the Organisation for Economic Co-operation and Development (OECD) agreed to help poor countries meet the UN's Millennium Development Goals (MDGs; OECD, 2001). The Doha trade round is inching towards more equity in the global trading system.[2] All of these steps will provide more aid and assistance to those countries suffering from extreme poverty

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and deprivation. But what about the environment? If we take stock of the last dozen years, has the health of the planet improved, and what steps can we take to ensure that this development assistance is sustainable for the economy and the Earth?

The Diagnosis

The world's population more than doubled from 1950 to 1998, and in the last 10 years it has increased by about 14 percent to reach a staggering 6.4 billion (United Nations Population Division, 2003). Optimistic projections peak in 2050 at 9 billion, an increase of 50 percent despite notable strides in family planning and the uncertain effects of HIV/AIDS (Population Reference Bureau, 2004). This unprecedented population growth has directly pressured land resources by increasing and intensifying agricultural use of marginal land, subjecting it to damaging overuse, such as excessive irrigation. Although 20th century inventions revolutionized agricultural productivity, 831 million people across the world remain hungry and malnourished (United Nations Development Programme, 2004). During the first half of the 21st century, many areas of the globe are expected to suffer heavy losses of cropland due to degradation, soil erosion, and climate change. About two billion hectares of soil—equal to 15 percent of the Earth's land cover—is already degraded (World Resources Institute [WRI], 2000). Between 1984 and 1998, the world's grain harvest fell behind population growth, with output dropping by 9 percent, or 0.7 percent yearly (Brown, Gardner, & Halweil, 1999). The prognosis is disheartening; there are so many more mouths to feed, but less to feed them.

The Food and Agriculture Organization (2003) predicts that developing countries will be forced to steadily increase their food imports. Unable to meet rising demands for food, countries will suffer greater poverty, declining health, higher infant mortality, and increased migration. As agriculturalists encroach on pastoralists in Africa, land use disputes can contribute to violent conflict.[3] So can migration, as in Chad, where incoming refugees competed with locals for scarce land resources (United Nations High Commissioner for Refugees, 2004). Deforestation exacerbates the competition for livelihoods; forest cover has declined by 2.4 percent since 1990, despite our pledges at Rio to reverse this trend (WRI, 2000).

Water stress is even more life-threatening than degraded land resources. By the mid-1990s, 80 countries, representing 40 percent of the world's population, suffered serious water shortages (United Nations Environment Programme [UNEP], 2002). By 2025, two-thirds of the entire world could experience moderate to severe water stress (United Nations Department of Economic and Social Affairs, 2002). Eighteen percent, or 1.1 billion people, currently lack access to safe drinking water, and 2.4 billion do not have adequate sanitation, mostly in Africa and Asia. Unsafe drinking water and inadequate sanitation transmit deadly waterborne diseases like malaria (1.2 million deaths/year) and diarrhea (1.8 million deaths/year); 90 percent of the victims are children under five (World Health Organization, 2004).

The news is not all bad, however: in the past decade, people with access to improved water supplies increased from 4.1 billion (79 percent) in 1990 to 4.9 billion (82 percent) in 2000, largely due to better national water policies, river basin cooperation, and more coordinated donor policies (UNEP, 2002). River basin cooperation may have also prevented conflict; scarce water resources can be a source of tension, but, as demonstrated by the Nile Basin Initiative, agreements to manage basins can improve relations.[4]

Unfortunately, the oceans are not improving. Pressure on the coastal zones constantly increases: more than 40 percent of the world's population now lives within 100 kilometers of the coast (WRI, 2000). Twenty-eight percent of the world's most important fisheries are depleted or overexploited, putting at risk the one billion people who rely on fish as their primary protein source. Overfishing by locals and by worldwide fleets "vacuuming the seas" can lead

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to conflicts; the UN recorded more than 100 disputes over fish in 1997 (Brown, Gardner, & Halweil, 1999).

In addition, global climate change could exacerbate the negative effects of all of these problems, increasing desertification, land degradation, coral reef dieback, and flooding and other extreme weather events (UNEP, 2002). And despite the naysayers, climate change becomes more and more likely; in 2004, scientists at Hawaii's Mauna Loa Observatory announced that carbon dioxide had reached record-high levels after growing at an accelerated pace during the previous year (Associated Press, 2004).

In all, despite some scattered improvements, the environment has grown more fragile almost everywhere, as the world's population continues to increase and the AIDS pandemic devastates the most economically active age group in many African countries.

The stage is set for increased poverty and misery. If we continue with business as usual, conflicts over resources can only become more severe. Even before we factor in the ethnic and social conflicts, youth unemployment, and social disintegration that make parts of Asia, South America, and the Middle East rich breeding grounds for terrorism, we can diagnose the patient with a dangerous case of environmental insecurity. The ethnic cleansing in Darfur is a perfect example. Militias have killed thousands of people, chasing 1.65 million from their homes to risk death from starvation and dirty water (United Nations, 2004). Why? Can it be partly because the region may have oil deposits that the central government wishes to exploit?

The Cure

The promise of the mid-1990s, when many governments, NGOs, and some enlightened businesses supported the goals of environmental security and sustainable development, has faded in the face of more proximate, pressing security concerns after September 11. The war on terrorism has preempted the international agenda and diverted attention and funds away from constructive political processes designed to assist developing countries achieve a better quality of life, like the Monterrey Commitments, MDGs, Johannesburg, and the Doha round. So what positive action is being taken?

United Nations

In 2001, Kofi Annan defined four burning issues that must be confronted in order to achieve a world in which terrorism cannot flourish: poverty, HIV/AIDS, conflict prevention, and sustainability (United Nations, 2001). To further this work, he charged a High-Level Panel on Threats, Challenges, and Change with examining not only the traditional "high" foreign policy concerns (war and peace and the UN's role), but also addressing these "soft" security issues.[5] Although the highest levels of the UN have validated environmental security and are prepared to address it, these admirable efforts are hampered by the persistence of institutional barriers to cross-agency cooperation and anemic exercise of political will by member governments, not to mention the usual chronic lack of funds.[6]

European Union

The European Union continues to take some progressive steps towards curing the human-induced stresses plaguing our planet. What is it doing to protect us from the long-term threats posed by environmental degradation and unsustainable development, and where should it focus during the next 10 years?

"With the introduction of the euro, the biggest enlargement in the history of European integration, and the adoption of a Constitution for Europe, we have united a continent once riven by conflicts, both military and ideological," announced President Romano Prodi (European Commission, 2004a). "What we have achieved is a Union that promises opportunities and security for its people and a strong voice worldwide. Our proposals are concrete, cost-effective, and timely: now the EU has to live up to its promises." That, of course, is the difficult bit.

The EU is heading in the right direction, at least according to its stated principles. The European Community was formed to prevent conflict, build a joint economy, and improve its citizens' quality of life. The European Constitution, signed in October 2004, encourages peace, security, and a sustainable economy, not only for Europe but also the world: "The Union shall work for sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and with a high level of protection and improvement of the quality of the environment… It shall contribute to peace, security, [and] the sustainable development of the Earth" (Title I, article I-3).

In addition, the EU's recently adopted security strategy, titled *A secure Europe in a better world* (2003), recognizes that security is essential for development and acknowledges the roles played by environmental factors in cycles of conflict:

> Security is a precondition of development. Conflict not only destroys infrastructure, including social infrastructure; it also encourages criminality, deters investment and makes normal economic activity impossible. A number of countries and regions are caught in a cycle of conflict, insecurity and poverty. Competition for natural resources—notably water—which will be aggravated by global warming over the next decades, is likely to create further turbulence and migratory movements in various regions. (pages 2-3).

Besides acknowledging the problems of environmental insecurity in Europe and worldwide, the EU pledges to use its policies—and its resources—to address the world's crises. "As a union of 25 states with over 450 million people producing a quarter of the world's Gross National Product (GNP), and with a wide range of instruments at its disposal, the European Union is inevitably a global player….Europe should be ready to share in the responsibility for global security and in building a better world" (2003, page 1).

But Europe must get its own house in order first. The EU Strategy for Sustainable Development, adopted in 2001 and currently being updated, requires integrating environment into its policies (e.g., trade, aid, fisheries, and agriculture): "[I]n the long term, economic growth, social cohesion, and environmental protection must go hand in hand" (Commission of the European Communities, 2001, page 2). In the recent Doha round negotiations, the EU made concessions that should make the market for developing countries' agricultural exports freer and fairer (European Commission, 2004b). The EU must do more to eliminate damaging subsidies, particularly in agriculture, in order to ensure environmental security at home and abroad. And more is being done: the fisheries policy, for example, is undergoing a thorough overhaul to make it less destructive not only within EU waters, but also worldwide (Commission of the European Communities, 2001).

The EU is the world's largest donor of official development assistance, contributing more than half of OECD's total aid—$29.9 billion out of $58.3 billion in 2002 (OECD, 2003). It has made considerable efforts to upgrade its development policy, although several Member States are struggling to increase their contribution. The EU also brought forward at Johannesburg two initiatives on water and energy supply that seek to ensure greater security for the developing world, and I hope the new commission will take them forward energetically. The EU's Water for Life initiative has made progress, drawing up plans for four regions and establishing a special water facility with an initial grant of 500 million euro in summer 2004.[7]

The EU should promote environmental security throughout Europe, including its direct neighbors. While the old saw asserts that Europe is an economic giant but a political pygmy, the new Member States and the new European Constitution offer the opportunity for the EU to become a much stronger force for peace and security worldwide.

United States

Will the United States complement these efforts? Its role is pivotal, and suffice it to say that Americans have had quite enough of Europeans telling them what they should do (and we are well aware that we cannot do it without you). Fortunately, plenty of Americans continue to push the cause of environmental security (for example, see Jared Diamond's commentary in this issue). Yale's John Lewis Gaddis has characterized the current administration's strategy as hegemony, preemption, and unilateralism (PBS, 2003). According to the distinguished 9/11 Commission, we need cooperation, enlightened aid (particularly for Muslim countries), and a return to multilateralism (National Commission on Terrorist Attacks upon the United States, 2004). The United States should deploy such strategies, as it did at the end of World War II and during the Cold War. But this time, it should also ensure that they are sustainable, taking into account all of Kofi Annan's burning issues, to ensure a more complete security at all levels: global, national, human, and environmental. John F. Kennedy's words ring as true today as in 1960: "Today our concern must be with that future. For the world is changing. The old era is ending. The old ways will not do."[8]

Although the highest levels of the UN have validated environmental security and are prepared to address it, these admirable efforts are hampered by the persistence of institutional barriers to cross-agency cooperation and anemic exercise of political will by member governments, not to mention the usual chronic lack of funds.

Conclusion

When ECSP was launched in 1994, we could reasonably have predicted that we would be much closer to achieving environmental security (and sustainable development) than we are today. While the developed countries may have adopted some good strategies at home, they have mostly missed the opportunity offered by the post-Rio consensus to promote sustainability and equity worldwide. We have sown the wind, and now we reap the whirlwind (and other extreme weather events!). Terrorism can only thrive when the majority of the world's population lacks the basic necessities of life: clean water, enough food, fertile land, and forests. We have the tools to achieve the MDGs and equity for all. Their environmental security is our security, so we must challenge all our governments to implement the aid, trade, and domestic policies so urgently needed to create a just world.

Notes

1. For more information on the Monterrey Commitments, see http://www.worldbank.org/prospects/gdf2003/gdf_ch06_web.pdf.

2. For the current status of the Doha round, see the International Institute for Sustainable Development's Doha Round Briefing Series at http://www.iisd.org/trade/wto/doha_briefing.asp, and also the World Trade Organization's overview of current agricultural negotiations at http://www.wto.org/english/tratop_e/agric_e/negoti_e.htm.

3. See, e.g., "DRC: IRIN Focus on Hema-Lendu conflict" (1999).

4. See "Water, Conflict, and Cooperation" by Alexander Carius, Geoffrey Dabelko, and Aaron T. Wolf in this issue for more on shared water resources.

5. For more on the High-Level Panel, see "The United Nations and Environmental Security: Recommendations for the Secretary-General's High-Level Panel on Threats, Challenges, and Change" in this issue.

6.The United States contributed 22 percent of the

UN's regular budget for 2003, whereas the European Union contributed 38 percent and Japan 20 percent (European Union, 2004a).

7. For more information on the Water for Life initiative, see http://europa.eu.int/comm/research/water-initiative/index_en.html.

8. For a transcript and recording of Senator John F. Kennedy accepting the Democratic Party nomination for the Presidency of the United States (July 15, 1960), see http://www.jfklibrary.org/j071560.htm

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From Environmental Peacemaking to Environmental Peacekeeping

ERIKA WEINTHAL

Nowhere is the notion that water causes conflict more widespread than in the Middle East. Former Secretary General of the United Nations Boutros Boutros Ghali warned in 1985, "The next war in the Middle East will be fought over water, not politics" (Vesilind, 1993, page 53). More than any other environmental resource, water is used to bolster claims that environmental degradation and resource scarcity produce conflict (e.g., Homer-Dixon, 1994).[1] Over the last few decades, scholars have sought to identify how competition over fresh water leads to interstate conflict (Gleick, 1993; Ohlsson, 1995; Elhance, 1999).

The emphasis on conflict, however, has overshadowed the less provocative—but no less major—premise that water is more likely to induce cooperation than conflict, even in arid regions with scarce or unevenly distributed freshwater supplies (Wolf, 1998). For example, contrary to predictions that water might spark interstate conflict in post-Soviet Central Asia (Panarin, 1994; Smith, 1995), water motivated *cooperation* among the five newly independent states of Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan (Weinthal, 2002). And despite all the hype about the Middle East's incipient water wars (Gleick, 1994; Starr, 1991), Israeli and Palestinian water managers continued to cooperate—even as other forms of economic and security cooperation collapsed—after the second intifada began in 2000 (Rinat, 2001).

While conflict and violence still dominate the environmental security discourse, new research focusing on environmental peacemaking has challenged the assumed link to conflict. Conca & Dabelko (2002) suggest, "Environmental cooperation can be an effective general catalyst for reducing tensions, broadening cooperation, fostering demilitarization, and promoting peace" (page 9). While it is still not clear if environmental cooperation can lead directly to peace, we should explore the environment's potential as a peacemaking tool in this increasingly unstable and conflictual world. During the next decade, three areas deserve our attention:

- Are water resources more likely than other resources to provoke conflict and/or engender peace? Intentionally or not, the essays in *Environmental Peacemaking* (Conca & Dabelko, 2002) largely focus on water. Are other environmental resources also positioned to foster peace?
- Most of the security threats that emerged in the 1990s are intrastate threats (e.g. civil war, genocide, political instability, and state collapse), suggesting that we should focus on this lower level of analysis. Could we use the environment as a peacemaking tool *within* states and along tenuous border regions?
- Can researchers, policymakers, and practitioners move away from conflict scenarios and environmental peace*making* towards environmental peace*keeping*? To date, the environment has largely been promoted as a mechanism to mitigate hostilities and therefore bring about peace; yet, the environment might also offer opportunities in the post-conflict resolution phase to sustain a fragile peace and prevent a return to violence.

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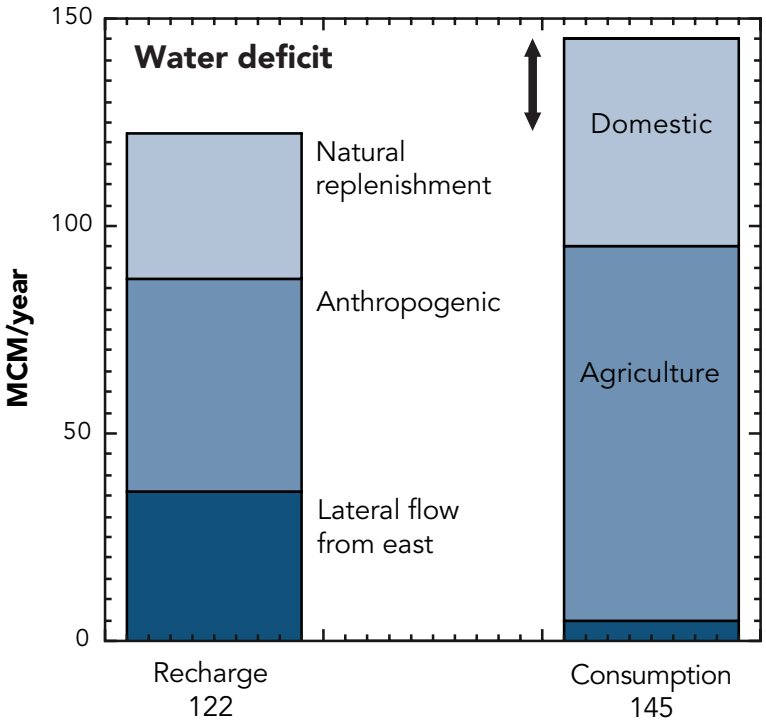
The Water Crisis in the Gaza Strip



Source: Data from UNEP (2003)

Central Asia and the Aral Sea: Interstate Cooperation but Local Conflict

International donors (e.g., the World Bank, the European Union's Tacis Programme, and U.S. Agency for International Development) sought to mitigate threats to regional stability in the Aral Sea Basin following the Soviet Union's collapse in 1991, given the region's small-scale, violent conflicts over land and water scarcity in 1989-1990. Due to this proactive intervention, the newly independent states established new institutions to jointly manage and protect the basin's water bodies (see Weinthal, 2002; Micklin, 2000). The prospects for acute interstate conflict faded, and the Central Asian states currently maintain a low level of formal cooperation through the 1998 agreement on water and energy use in the Syr Darya Basin. Nevertheless, local water disputes (especially along the Kyrgyzstan-Tajikistan border and in the Fergana Valley between Kyrgyzstan and Uzbekistan) are still unresolved, with no real movement in either direction (International Crisis Group, 2002).

The locus of potential conflict and political instability shifted from the interstate to the local level for a number of reasons:

- Early donor programs trying to instigate cooperation in the Aral Sea Basin failed to build local capacity; stakeholders like local and international NGOs, for example, were initially excluded from large-scale donor projects;
- Large multilateral organizations have directed aid primarily to large-scale infrastructure projects, such as a drainage collector in the Amu Darya Basin, rather than smaller-scale projects in densely populated areas and border regions;[2] and
- The first phase of donor assistance sought to reform the water and energy sectors at the expense of cotton farming, which consumes the most water in the region. Cotton cultivation is not only the backbone of Central Asian economies, but also a mechanism for social and political control through which governments exchange social protection for political acquiescence (Weinthal, 2002).

The case of the Aral Sea Basin underscores the need for future research on environmental peacemaking at the subnational level and in border regions. While peacemaking may start at the interstate level, conflicts may fester at the intrastate level, unless local stakeholders are included in the efforts to build peace. To use the environment as a vehicle for building trust and cooperation, policymakers should invest in building local capacity, by strengthening local water user associations and civil society groups, for example. Moreover, if policymakers and practitioners want to ensure that conflict will not erupt at both the interstate and intrastate levels, they must understand the broader social and political context. Water-sharing problems at both levels cannot be effectively resolved

unless the Central Asian states diversify their agricultural economies by turning away from water-intensive crops like cotton. To encourage this diversification, donors must push for political and economic reforms that would support family farms at the local level.

Lastly, researchers and practitioners should assess whether they could use other environmental issues, besides water, to reduce interstate and intrastate conflicts. Water has overshadowed efforts to combat desertification and the loss of biodiversity in Central Asia. Peace parks along the border of Turkmenistan and Uzbekistan, for example, might provide innovative opportunities for local communities to work together—both within states and across borders—to promote biodiversity, regional cooperation, and economic development.

The Middle East: Peacekeeping

Water cooperation in the Middle East—unlike Central Asia—has proved daunting because political problems dwarf the region's environmental concerns. Conventional wisdom, which holds that larger political issues must be resolved for cooperation to emerge, exacerbates pessimism about the potential for environmental peacemaking in the region (see Lowi, 1993). Yet, once the hostile parties embark upon the road to peace, environmental issues could be used to sustain the journey. The Middle East could be a striking example of moving from environmental peacemaking to environmental *peacekeeping*. While the environment will not bring Israel and the Palestinian Authority to the bargaining table, it might provide one of the few opportunities to foster interdependence and hence sustain peaceful relations once the two parties agree to end the conflict.

After Kuwait, the Gaza Strip is the most "water poor" region in the world, with only 52 cubic meters available per person each year (International Atomic Energy Agency, 2003). It is also one of the most densely populated areas in the world: over 1.3 million Palestinians are crowded into approximately 400 square kilometers (U.S. Bureau of the Census, 2004). The Gaza Strip faces a mounting water crisis; water used in the Gaza Strip is not replenished, and groundwater quality has severely deteriorated as saline water rapidly replaces fresh water.

Resolving this crisis will require Israel's cooperation, since the Gaza Strip shares the southern Mediterranean Coastal aquifer with its upstream neighbor. Although the poor water quality is caused by intrusions of natural saline groundwater, overuse in the Gaza Strip exacerbates the problem by lowering the water table and increasing the flow rate of natural saline water from Israel to the Gaza Strip (Vengosh et al., forthcoming). Even though its upstream consumption does not contribute to the aquifer's deterioration, Israel could help mitigate salinity downstream by increasing pumping along the border region, which would reduce the flow of natural saline water, while the Palestinians simultaneously limit or reduce pumping within the Gaza Strip (Weinthal et al., in press). The international community should encourage Israel and the Palestinian Authority to develop a joint management plan to implement this solution. With international assistance, desalination plants along the Israeli-Gaza Strip border could treat the groundwater pumped by Israel and transport it to the Gaza Strip.

This mutually beneficial plan would fortify relations, especially after political borders are established to separate the two parties. The Palestinian Authority would obtain another source of drinking water for its growing population and remediate the Gaza Strip's salinity problem. For Israel, the groundwater transfer could serve as a goodwill gesture. While the upstream-downstream scenario and the region's political tension would argue against cooperation, a joint water management plan to solve the Gaza Strip's water crisis could instead help keep the peace after an Israeli withdrawal.

Conclusion: Local Environmental Peacemaking and International Peacekeeping

Environmental peacemaking promises to transform our understanding of the link between the

Israeli and Palestinian water managers continued to cooperate—even as other forms of economic and security cooperation collapsed—after the second intifada began in 2000.

While peacemaking may start at the interstate level, conflicts may fester at the intrastate level, unless local stakeholders are included in the efforts to build peace.

environment and conflict. However, two major arenas remain relatively unexplored: using the environment to prevent local conflicts and to maintain peace. Researchers and policymakers seeking to expand environmental peacemaking over the next decade should pursue the following agenda:

- Explore using other environmental resources—not just water—as a source of cooperation (e.g., peace parks);
- Focus more on intrastate—not just interstate—conflicts;
- Donor programs should pay attention to the social and political context and encourage local capacity building instead of simply emphasizing technical cooperation; and
- Recognize that conflict resolution also requires maintaining peace. Therefore, environmental peacemakers should conceptualize a new approach—environmental peacekeeping.

Notes

1. For a critique of the environmental security literature focusing on conflict, see Peluso and Watts (2001).

2. After activists criticized this approach, the international community invested in some local projects, such as supporting water user associations and retrofitting local canals.

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Demographic Security Comes of Age

RICHARD P. CINCOTTA

On the day I began to write this essay, *The New York Times* reported that Pakistan planned to bulldoze all Afghan refugee camps within three miles of its northwest border. U.S. intelligence satellites had tracked cross-border movements to and from these settlements, and Pakistani Army units repeatedly engaged insurgents in the area (Gall, 2004). Another article discussed international opposition to the wall Israel is constructing on the West Bank—ostensibly to eliminate terrorist incursions, but in practice to exclude and isolate the rapidly growing Palestinian population (Hoge, 2004). Two other accounts attracted my attention: a report on U.S. foreign aid for Haiti, which has the youngest and fasting growing population in the Western Hemisphere, and an analysis of factional political violence in the Gaza Strip—a tiny enclave that hosts one of the youngest and fastest growing populations in Asia.

What do these articles have in common? Each focused on an event with implications for national or global security and had an unmistakable demographic component, and therefore, lies within the domain of "demographic security." Demographic security addresses the security aspects of:

- A population's size, age structure, geographic distribution, or ethnic composition; and
- Changes in these demographic conditions and interactions among them, including migration, population growth, shifts in the age structure, and changing location and proportion of ethnic and religious groups.

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Demographic security issues are on many multilateral agendas, as demonstrated by the European Union's concern with its aging native population and its growing Muslim communities (Savage, 2004), and the UN's focus on poverty, trade in light weapons, and HIV transmission in new cities along the truck routes winding through Africa (Hope, 1998; UN-Habitat, 2003). These seemingly hodgepodge issues are connected by a common theoretical thread: the "demographic transition," or the process by which a population characterized by relatively short lives and large families is transformed into a population composed principally of people living longer lives and having small families (Figure 1). In our 2003 monograph *The Security Demographic: Population and Civil Conflict after the Cold War,* my colleagues, Robert Engelman and Daniele Anastasion, and I contend that the demographic transition is the key to understanding demographic security issues.

Civil Strife and Soft Landings

To test this notion, we compared demographic data from the United Nations Population Division (UNPD, 2003) and the Uppsala Conflict Data Project's global database.[1] We focused only on *civil conflicts*—revolutions, ethnic and religious insurgencies, state-sponsored violence, and domestic terrorism. This broad class of intrastate conflicts nearly tripled in annual prevalence between 1950 and 1992, and their average duration has grown since the 1980s (Collier, Hoeffler, & Söderbom, 2001).

After filtering out persistent and recurring conflicts, we found countries in the early and middle stages of the demographic transition—with high birth and death rates—much more likely to experience an outbreak of new civil conflict than those farther along in the transi-

tion (i.e., with lower birth and death rates). The trend held up through the 1970s and 1980s, as well as the post-Cold War 1990s, suggesting that superpower funding, training, and military hardware may have influenced the nature and intensity of Cold War-era civil conflicts more than developing states' vulnerability to them (see Figure 2).

Our research also shows that the statistical likelihood of civil conflict decreased consistently as countries' birth rates declined, suggesting that for most states, the demographic transition promotes a "soft landing." Significantly, a soft landing is not an inherent property of the democratic transition, which features instabilities midway along its path. Partial democracies—states offering an institutional admixture of civil freedoms and authoritarian constraints—are more statistically vulnerable to state failure than either fully democratic or wholly authoritarian regimes (Esty et al., 1999).

Some developing countries appear to risk similar instabilities midway through their transition to an open free-market economy. In a series of analytical case studies, Amy Chua (2002) has demonstrated that IMF-leveraged liberalization policies unwittingly provide market-savvy ethnic minorities with opportunities to gain further control over capital. Coupled with fast-paced democratic reforms, increased inequalities fuel ethnic animosities, boost popular support for nationalist political movements and, in some cases, act as a springboard for demagogues to attain political office (Chua, 2002).

The security dynamics of these transitions lend credence to the hypothesis that early-phase states—including Iraq, Pakistan, and Nigeria—might lower their risk of civil conflict during their transitions to democracy and free markets if they advanced through the demographic transition. This thesis explains the substantial democratic, social, and economic progress of certain East Asian states (particularly South Korea, Taiwan, Thailand, Singapore, and Malaysia), where significant declines in fertility preceded substantial and successful democratic and free-market reforms.

Demographic Risk Factors

Researchers have found at least eight demographic topics associated with political instability or conflict. These are:

High proportion of young adults ages 15 to 29 years—a "youth bulge"—among the working-age population. In the 1990s, states with a large youth bulge were nearly 2.5 times as likely to experience an outbreak of civil conflict as other states (Cincotta, Engelman, & Anastasion, 2003).[2] York University researchers Christian Mesquida and Neil Weiner (1996, 1999) have also demonstrated that the intensity of recent conflict in war-torn regions is positively correlated to the proportion of young adults in the adult population.

Rapid urban population growth. During the 1990s, countries with a high rate of urban population growth were about twice as likely as other states to experience an outbreak of civil conflict. On the ground, researchers and policymakers may find it difficult to separate urban growth and the youth bulge. In countries where agriculture is no longer promising, young adults typically migrate to urban centers in search of education, employment, and opportunities for immigration. Thus, urban centers, where political protest is more easily organized, tend to have unusually high proportions of young adults in their working-age population (Fuller & Pitts, 1990).

Low levels of per capita cropland and/or fresh water. Cross-country statistical evidence does not demonstrate that low per capita supplies of either fresh water or cropland increase the risk of full-fledged civil conflict on their own. Nonetheless, the added risks to states under stress could be underrated. For example, in the 1990s, about half of all countries with high proportions of young adults *and* low levels of one or both of these critical resources experienced an outbreak of civil conflict (Cincotta et al, 2003). Leif Ohlsson (2000) has argued that scarcities of critical natural resources undermine the ability of agricultural economies to absorb labor, promoting landless poverty and thus accelerating the growth of urban slums and providing potential recruits for insurgencies.

U.S. foreign policy should improve girls' access to schooling and women's access to family planning, maternal health care, and income-generating opportunities.

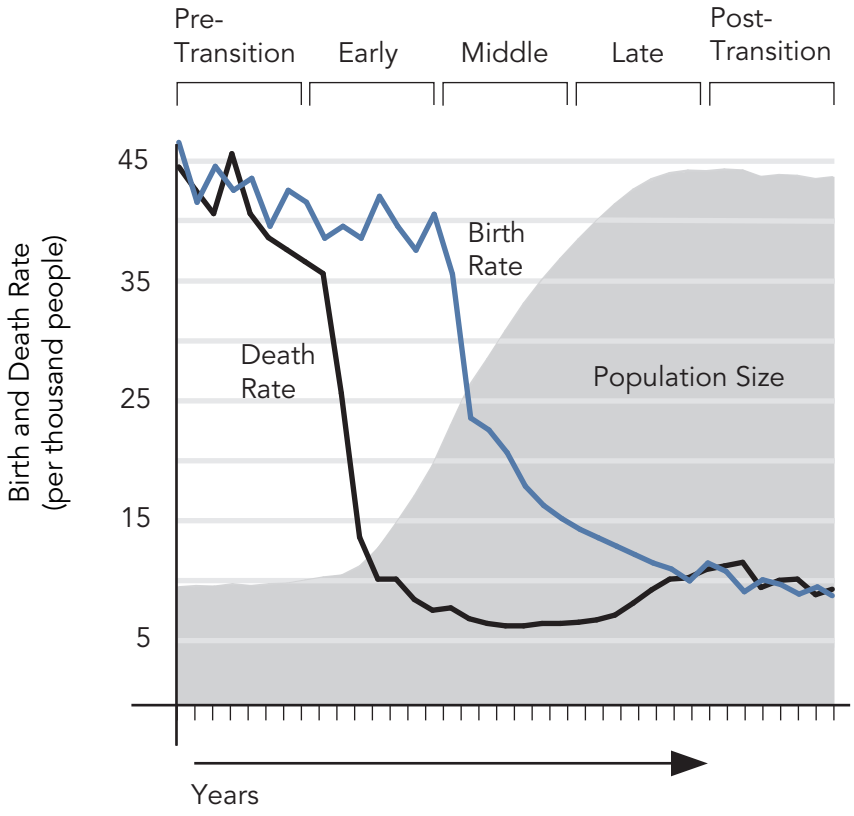

Figure 1. The demographic transition (an idealized version of which is pictured) is comprised of two components: birth rate and death rate transitions. Historically, the death rates have dropped before birth rates. Rapid population growth occurs when a gap opens up between birth and death rates. Individually, birth rate and death rate transitions have taken from 50 to 150 years to complete. Some developing countries are passing through these transitions rapidly, much faster than European or North American populations did during the 19th and early 20th centuries.
Source: Cincotta, Engelman, and Anastasion (2003)

High mortality rates among working-age adults (indicative of high rates of AIDS mortality). There is insufficient statistical evidence to link HIV/AIDS to the outbreak of conflict. Nonetheless, we should explore the arguments that point to the disease's effects: large youth bulge, the loss of key professionals, weakened military and police units, and unprecedented numbers of orphans. The future demographic impacts of HIV/AIDS are likely to exceed those of the 1980s and 1990s dramatically.

Differential growth rates among ethnic and religious groups. Tensions can arise when changes in ethnic or religious group distribution and composition (the proportions of such groups in the population) are perceived as threats to the political character, traditions, or cultural practices of another group. Tensions can also arise when groups are denied political access commensurate with their perceived share of the population. Such tensions are likely to increase in the 21st century, as ethnic populations within countries progress through the demographic transition. Unfortunately, many countries lack accurate data on ethnic composition and differential ethnic fertility and mortality rates, limiting opportunities for country analyses and cross-national comparisons.

Migration. Refugees and other cross-border migrants often evoke fears and provoke anti-immigrant tensions in host countries. While the vast majority of migrants seek only to eke out a living or assimilate, some aid insurgents or actively participate in insurgencies. Trends and policies that influence migration, ethnic relations, separatism, and assimilation warrant closer study and more accurate data.

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High sex ratios (populations where men vastly outnumber women). In their new book, political scientists Valerie Hudson and Andrea den Boer (2004) use historical accounts to make the case that populations with a high sex ratio are more vulnerable to political unrest and

civil conflict. The authors focus on contemporary China and India, where sons are strongly preferred to daughters. As in other Asian countries, public access to ultrasound technology and amniocentesis has facilitated sex-selective abortion, resulting in highly skewed sex ratios. Separating the security-related effects of skewed sex ratios from those of the youth bulge and other demographic and social phenomena may prove difficult, but this provocative thesis, although speculative, should nonetheless stimulate further research.

Demography Is Not Destiny

For those involved in foreign policy, demographic changes can be viewed most constructively as challenges and vulnerabilities to the state and its institutions—or, in some instances, as options and opportunities. For example, when jobs are scarce, a large and growing youth bulge can lead to increased discontent, crime, and political unrest. States have responded in several ways to this stress: drawing young men into the military and internal security forces, exercising repressive controls, or promoting labor out-migration to industrial countries and facilitating remittances (savings sent home by foreign workers; Ware, 2003). However, when investment-driven job growth provides educated young adults with economic and social mobility, a youth bulge could provide a large group of taxable workers for the workforce. Similarly, high rates of urbanization often produce slum housing and inadequate services, increasing the risk of crime and civil unrest. Yet, where infrastructure investment accompanies urban growth, cities are significant sources of economic growth.

The demographic future is anything but certain; demographic trends are not immutable. That said, some aspects of population dynamics are clearly more susceptible to interventions. In the recent past, policies and programs have had enormous effects on childhood mortality and fertility, particularly in East Asia and the Caribbean. Population growth and decline are not as malleable; these trends are imbued with momentum and thus difficult to reverse (save some enormous catastrophe or burst of migration) because past population dynamics have already established the size of the reproductive-age population for the next 15 to 20 years.

Next Steps for Policymakers

While the plethora of unresolved controversies and unanswered questions will no doubt drive further research in demographic security, the post-9/11 price for policy inaction and disengagement is extraordinarily high and will be measured in security crises, failed states, and lost human lives. Thus, we should ask: how can professionals in the diplomatic, military, and intelligence communities act, in a timely fashion, upon the results of demographic security research?

If our conclusions are true, then the responses are self-evident: U.S. foreign policy should improve girls' access to schooling and women's access to family planning, maternal health care, and income-generating opportunities. Improving women's status can influence social environments, help change cultural norms, and ultimately speed the demographic transition. Increasing women's participation in government, particularly in post-conflict negotiations, could help shift priorities away from armed confrontation and towards human development. The presence of high numbers of qualified women in important and visible diplomatic and military roles at home and abroad would also contribute to changing attitudes about women's roles.

To facilitate changes based on the security demographic, the national security community should make the demographic transition part of their global threat assessments and scenario exercises. Analysts should consider the security implications of trends in age structure, urban slum growth, rural landlessness, ethnic growth-rate imbalances, and other demographic factors. And, when asked to comment on the security implications of demography, analysts should remind policymakers of the programs already available in the "foreign aid toolbox"—

Early-phase states—including Iraq, Pakistan, and Nigeria—might lower their risk of civil conflict during their transitions to democracy and free markets if they advanced through the demographic transition.

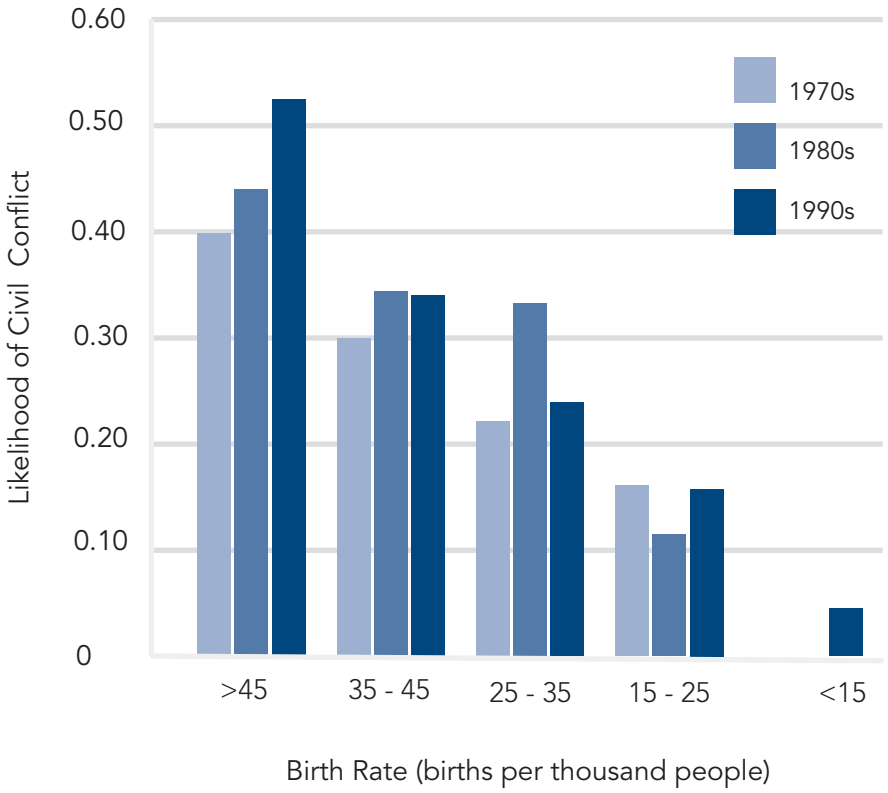

Figure 2. As countries' birth rates declined during the last three decades of the 20th century, their likelihood of civil conflict also tended to decline. While this relationship was most dramatic in the 1990s, it was also evident during the 1970s and 1980s, decades during which many civil conflicts were considered to be Cold War "proxy wars" (each side supported by one of the opposing superpowers).
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namely, voluntary family planning services and girls' education—that promote positive demographic and social change.

Globally, the demographic transition is incomplete. One-third of all countries in the world remain in the early stages, with four or more children per woman. When the northern states of India are included, this population—the most conflict-affected in the world—comprises about 1.5 billion people (UNPD, 2003). Unfortunately, the demographic stresses endured by these countries are likely to receive less and less attention as the news media focuses instead on the industrial world's demographic issues: population aging, population decline, and immigration. The significant risks of delaying progress through the demographic transition, and the decades it can take to dissipate those risks, underscore the need for donors and developing-country governments to increase financial and political support for policies and programs that lead to positive demographic changes: those that expand girls' educational opportunities, give couples the ability to choose the timing and frequency of childbirth, and increase women's participation in government and in the workplace.

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Demographic Security Comes of Age

RICHARD P. CINCOTTA

On the day I began to write this essay, *The New York Times* reported that Pakistan planned to bulldoze all Afghan refugee camps within three miles of its northwest border. U.S. intelligence satellites had tracked cross-border movements to and from these settlements, and Pakistani Army units repeatedly engaged insurgents in the area (Gall, 2004). Another article discussed international opposition to the wall Israel is constructing on the West Bank—ostensibly to eliminate terrorist incursions, but in practice to exclude and isolate the rapidly growing Palestinian population (Hoge, 2004). Two other accounts attracted my attention: a report on U.S. foreign aid for Haiti, which has the youngest and fasting growing population in the Western Hemisphere, and an analysis of factional political violence in the Gaza Strip—a tiny enclave that hosts one of the youngest and fastest growing populations in Asia.

What do these articles have in common? Each focused on an event with implications for national or global security and had an unmistakable demographic component, and therefore, lies within the domain of "demographic security." Demographic security addresses the security aspects of:

- A population's size, age structure, geographic distribution, or ethnic composition; and
- Changes in these demographic conditions and interactions among them, including migration, population growth, shifts in the age structure, and changing location and proportion of ethnic and religious groups.

Richard P. Cincotta is senior research associate at Population Action International, a policy research organization in Washington, D.C.

Demographic security issues are on many multilateral agendas, as demonstrated by the European Union's concern with its aging native population and its growing Muslim communities (Savage, 2004), and the UN's focus on poverty, trade in light weapons, and HIV transmission in new cities along the truck routes winding through Africa (Hope, 1998; UN-Habitat, 2003). These seemingly hodgepodge issues are connected by a common theoretical thread: the "demographic transition," or the process by which a population characterized by relatively short lives and large families is transformed into a population composed principally of people living longer lives and having small families (Figure 1). In our 2003 monograph *The Security Demographic: Population and Civil Conflict after the Cold War,* my colleagues, Robert Engelman and Daniele Anastasion, and I contend that the demographic transition is the key to understanding demographic security issues.

Civil Strife and Soft Landings

To test this notion, we compared demographic data from the United Nations Population Division (UNPD, 2003) and the Uppsala Conflict Data Project's global database.[1] We focused only on *civil conflicts*—revolutions, ethnic and religious insurgencies, state-sponsored violence, and domestic terrorism. This broad class of intrastate conflicts nearly tripled in annual prevalence between 1950 and 1992, and their average duration has grown since the 1980s (Collier, Hoeffler, & Söderbom, 2001).

After filtering out persistent and recurring conflicts, we found countries in the early and middle stages of the demographic transition—with high birth and death rates—much more likely to experience an outbreak of new civil conflict than those farther along in the transi-

tion (i.e., with lower birth and death rates). The trend held up through the 1970s and 1980s, as well as the post-Cold War 1990s, suggesting that superpower funding, training, and military hardware may have influenced the nature and intensity of Cold War-era civil conflicts more than developing states' vulnerability to them (see Figure 2).

Our research also shows that the statistical likelihood of civil conflict decreased consistently as countries' birth rates declined, suggesting that for most states, the demographic transition promotes a "soft landing." Significantly, a soft landing is not an inherent property of the democratic transition, which features instabilities midway along its path. Partial democracies—states offering an institutional admixture of civil freedoms and authoritarian constraints—are more statistically vulnerable to state failure than either fully democratic or wholly authoritarian regimes (Esty et al., 1999).

Some developing countries appear to risk similar instabilities midway through their transition to an open free-market economy. In a series of analytical case studies, Amy Chua (2002) has demonstrated that IMF-leveraged liberalization policies unwittingly provide market-savvy ethnic minorities with opportunities to gain further control over capital. Coupled with fast-paced democratic reforms, increased inequalities fuel ethnic animosities, boost popular support for nationalist political movements and, in some cases, act as a springboard for demagogues to attain political office (Chua, 2002).

The security dynamics of these transitions lend credence to the hypothesis that early-phase states—including Iraq, Pakistan, and Nigeria—might lower their risk of civil conflict during their transitions to democracy and free markets if they advanced through the demographic transition. This thesis explains the substantial democratic, social, and economic progress of certain East Asian states (particularly South Korea, Taiwan, Thailand, Singapore, and Malaysia), where significant declines in fertility preceded substantial and successful democratic and free-market reforms.

Demographic Risk Factors

Researchers have found at least eight demographic topics associated with political instability or conflict. These are:

High proportion of young adults ages 15 to 29 years—a "youth bulge"—among the working-age population. In the 1990s, states with a large youth bulge were nearly 2.5 times as likely to experience an outbreak of civil conflict as other states (Cincotta, Engelman, & Anastasion, 2003).[2] York University researchers Christian Mesquida and Neil Weiner (1996, 1999) have also demonstrated that the intensity of recent conflict in war-torn regions is positively correlated to the proportion of young adults in the adult population.

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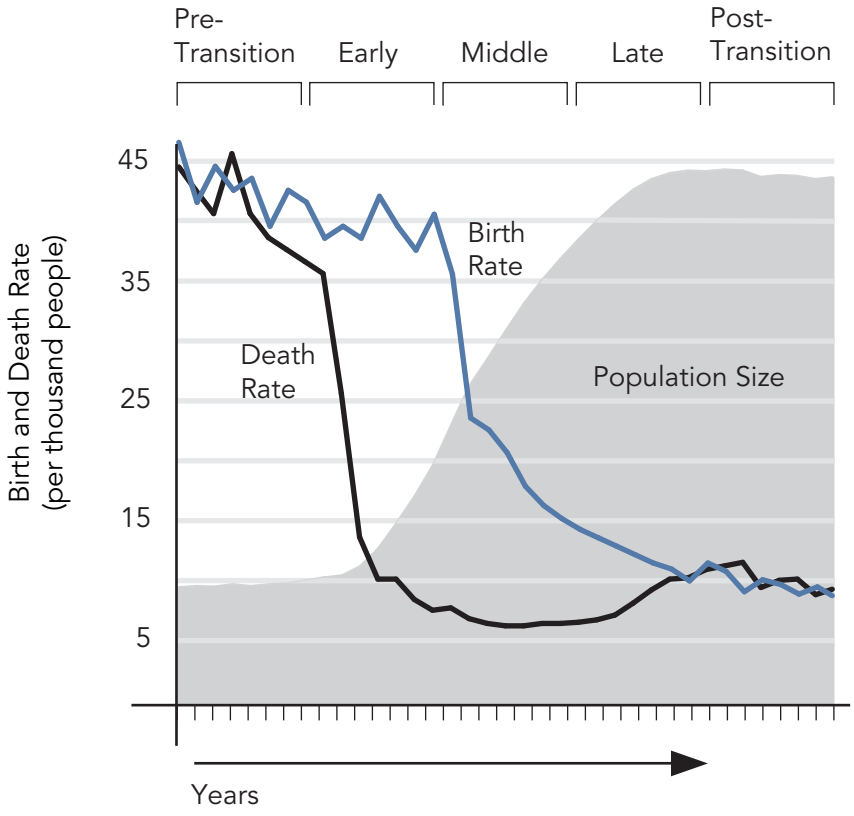

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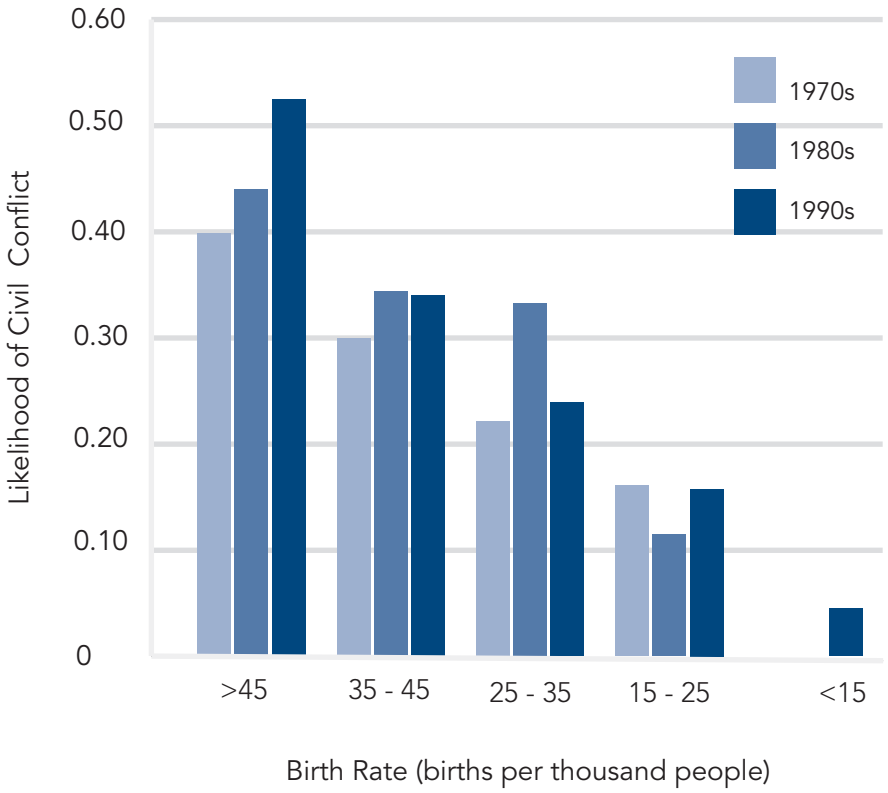

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An Agenda for Population, Health, and Environment

ROGER-MARK DE SOUZA

Earth's ecosystems and its human population are inherently connected. The fundamental relationships are fairly easy to grasp: Earth provides energy and raw materials for human activities, which in turn affect the ecosystems; damage to those environmental goods can adversely affect people's health and well-being. International attention to these linkages peaked in the 1990s, but innovative community-based initiatives continue to address them. This article explores population, health, and environment (PHE) connections, identifying our accomplishments, current challenges, and priorities.

What have we accomplished?

Around the world, many programs address PHE connections by incorporating reproductive health into environmental protection programs or vice versa. Local conservation groups, national governments, and international organizations are using integrated interventions in the world's biodiversity hotspots and tropical wildernesses. These new approaches integrate family planning and conservation activities in community-based projects, through which ecologists, health specialists, and community development experts link factors like environmental stress, fertility, migration, women's health, women's educational status, and economic decisions.[1]

Local communities welcome integrated interventions because they reflect the reality of people's lives. Water shortages and unclean water affect their children's health. Areas of high biodiversity often attract migrants, increasing the impact on natural resources. Unchecked coastal development may pollute coastal waters, damage fisheries, and ultimately reduce economic opportunities, food security, human health, and marine resources.

When local communities are empowered, they can sometimes convince decision-makers to address these issues in an integrated manner. Some institutions, such as government committees charged with integrating PHE concerns into national development strategies, promote sustainable development and encourage collaboration across ministries and government departments. As a result, policies to solve broad problems like food shortages may address a wide range of issues, such as migration, intensified industrialization, and food imports. Short-term solutions for a single sector are unlikely to be effective over the long term.

Some donors are supporting integrated work. In the United States, PHE funding increased in the late 1990s, but this growth has been fueled by only a handful of foundations, such as the David and Lucile Packard Foundation and the Compton Foundation, and public sources like the United States Agency for International Development and the National Institutes of Health. The total amount of integrated funding, however, is only a small percentage of overall population and environmental funding (Gibbs, 2003).

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New models and technology address PHE linkages. Technological advances have enabled farmers to grow more food on less land, cities to clean wastewater, and nations to protect areas of significant biodiversity. In India, for example, communities have used new technologies and community mobilization to convert open-access natural resources into community-controlled resources, thereby increasing the residents' incomes from forest products and protecting the area's biodiversity (McNeely & Scherr, 2003, pages 46-47, 234). In addition, research-based programs and policies have enhanced environmental protection and improved human well-being. Examples include Zimbabwe's experience decentralizing wildlife user rights in the CAMPFIRE program, which was adopted in other Southern African countries, and the National Biodiversity Institute (INBio) of Costa Rica's bioprospecting initiative, which was adapted by projects in Mexico, Indonesia, and the Philippines (World Resources Institute, 1997).

Why have we not done more?

Examining, designing, implementing, and funding integrated work is a continuing challenge. A common stumbling block for researchers, program managers, local communities, and donors is how to "do integration." PHE scholars and practitioners have not settled on a unifying methodology. Program documentation tends to target the funding agency and should be disseminated broadly so that other program managers can determine when to apply an integrated approach. Similarly, decision-makers grapple with how to apply integrated policies across sectors, budgets, and regulations. And donors remain largely wedded to traditional sectoral funding approaches, only occasionally dabbling in cross-sectoral experiments.

The complexity of these linkages clouds the appropriate intervention points. Intuitively, linking population, health, and environment issues makes sense. This link is less clear, however, when other variables, such as technology, culture, economics, or politics, come into play. What kind of interventions will have the greatest impact? If we want to preserve old growth forests, should we fight corruption that awards favorable concessions to rapacious logging companies, or should we prevent migrant workers from moving in? These interventions are difficult to evaluate, partly due to poor-quality data on the factors driving change.

Collaboration is complicated by major differences in paradigms, assumptions, and definitions. Reconciling different (and sometimes contradictory) conceptual approaches is complicated by divergent methodologies and the conflicting interests of individuals, communities, organizations, and governments.

Business as usual often stymies collaboration. Some organizations are reluctant to add a program in another sector, like a conservation organization providing family planning services, even if it would maximize their impact. They do not have the resources, expertise, or staff capacity, and they feel that such efforts would divert them from their stated mission. Similarly, donors fund projects according to specific program areas, and when funding is tight, they fall back on more established programs. At the community level, integrated programs may be constrained by cultural and religious norms, especially when addressing sensitive issues like the role of women in natural resource management or voluntary modern family planning methods. Traditional practices, cultural differences, or powerful interests may block integrated efforts to change the status quo.

The exclusion of "influentials" impedes implementation. Influentials (e.g., journalists, important community members, and political, civic, and religious leaders) can shape policy and influence attitudes and behaviors. When influentials are excluded from a research project or program, they may not support its recommendations. Journalists, for example, need simple ways to explain the demographic and health dimensions of environmental stories, a news "peg" that can sell the story to their editors, and access to information and experts. If the media are included in projects and given opportunities to report, they could help bring PHE issues to

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the attention of policymakers and the public. If included, policymakers may also better understand the applicability—as well as the legal, budgetary, and regulatory implications—of research results.

Messages do not clearly illustrate how integration helps constituents. Researchers, advocates, and program staff need to develop simple, evidence-based, and compelling messages that convey the importance of integrated programs. Such messages could help, for example, a conservation organization understand how addressing human migration furthers its conservation goals, an adolescent reproductive health program justify adding a community conservation program, or a policymaker recognize that food security and economic opportunities increase when community members voluntarily choose to space their children and preserve mangrove forests.

PHE data are difficult to find and compare across sectors and scales. Demographic and ecological data are not collected at comparable geographic scales. Demographic surveys are usually conducted within a political region, such as a district or country, whereas environmental data cover a particular ecosystem or landscape, often crossing political boundaries. In addition, it is difficult to find data at local levels, such as data on migration in particular communities.

Wide-ranging project indicators inhibit developing common thresholds and standards. Determining how much to invest without a standard method for measuring and evaluating success can be difficult. Similarly, without a common set of approaches for implementing integrated programs, managers face a difficult question: should they partner with other groups to complement their skills or develop integrated expertise within their staff? Should all of a program's interventions have population, health, and environment dimensions or should separate departments set parallel population, health, and environment goals?

Limited timeframes and uncertainties inhibit political will. Demographic and environmental change can be slow, uncertain, and imperceptible over the short term. Researchers are refining methodologies, field practitioners are testing approaches, and advocates are building a body of evidence. However, this process could take many years, and this timeframe is out of sync with electoral terms, funding cycles, and immediate needs.

What should we do now?

Increase understanding of PHE linkages and their impacts. We need to reach policymakers, researchers, and the public by effectively disseminating critical PHE information. We must:

- Determine the information needed by policymakers and communities to make decisions and provide it in formats suitable for non-technical audiences;
- Identify those aspects of PHE, related to urgent development needs, that are most applicable for research and policy;
- Initiate and coordinate research projects that test methodologies, address topics relevant to current policies, and can influence policy deliberations and decisions; and
- Develop indicators that can measure success and demonstrate the value added by taking an integrated (instead of a single-sector) approach.

Strengthen advocates' abilities to focus policy attention on key PHE issues. To build momentum for PHE integration, advocates must trumpet success stories and express its advantages in terms that appeal to constituents. We need to:

- Explain to environmental organizations why population is key to their work, and explain to population organizations how environmental analysis furthers their objectives;
- Convince donors to increase and sustain funding for PHE research, programs, and advocacy by tying PHE interventions to development priorities, garnering political will, demonstrating tangible benefits to local communities, and encouraging foundations to fill funding gaps left by government and bilateral aid;

Table: Challenges in addressing population, health, and environment linkages

	Category of Challenges			
Audience	**Methodology**	**Collaboration**	**Communication**	**Measurement**
Researchers	Limited theoretical literature	No incentive to collaborate across disciplines	End users (e.g., communities and policymakers) are not included	Data are not available and/or comparable across sectors and scales
Program managers and staff	Approaches are not documented	Lack of cross-sectoral partnerships and staff capacity; possible "mission drift"	Lack of integrated program messages and coordination across departments and programs	Lack of monitoring and evaluation indicators
Communities	Appropriate points of entry are not identified	Cultural and religious traditions (among others) discourage change	Integration's relevance to community priorities is not demonstrated	Data are not available at appropriate scale
Donors	Long-standing traditional divisions	Lack of coordination within donor agencies and among donors	Integration is not linked to legislative priorities	Return on investment is not measured
Policymakers	Lack of policy examples	Accountability is spread across budgets and spheres of responsibility	Integration is not linked to constituents' priorities	Short political timeframes make integration politically unpalatable and infeasible

- Conduct expert seminars for journalists, increase their understanding of technical issues, and suggest investigative techniques and leads for covering PHE linkages; and
- Give policymakers examples of approaches they can use and frame policy issues in terms of constituents' needs.

Increase capacity for cross-sectoral programming and funding by providing technical assistance. We must:

- Develop materials (e.g., workshops, manuals, toolkits) to help key actors, such as wildlife conservationists, health promoters, and coastal managers, integrate demographic analysis into environmental decision-making and programming;
- Help population specialists at the regional and country level access state-of-the-art information and provide methodological advice for addressing these issues in policy work and population-development programs;
- Share tools and approaches, such as project design and evaluation methods;
- Explore ways for natural and social scientists to contribute to field-based programming; and
- Improve reproductive health services by integrating population and environment programming.

To build momentum for PHE integration, advocates must trumpet success stories and express its advantages in terms that appeal to constituents.

Build expertise to contribute to policy decisions. Field practitioners should learn to mobilize and train others, advocate policy change, and communicate effectively. We need to:

- Conduct training sessions to help researchers and advocates communicate with policymakers;
- Create, support, and strengthen local PHE networks and build coalitions; and
- Develop approaches and materials that use environmental data to advocate for population and reproductive health issues.

Putting Lessons to Work

In 2003, with support from the Compton Foundation, Population Reference Bureau (PRB) conducted a PHE case study, "Generating Political Will for Population, Health, and Environment." The case study summarized an eight-year process that led to the adoption of gender equity policies and action plans in the environmental agencies of every government in Mesoamerica (Central America and Mexico). PRB reviewed project documents, surveyed and interviewed project staff, and carried out field-based observations.

The case study documented policy successes (policy changes, allocation of funds, workplans, ministerial declarations); identified factors that influenced the policy agenda, such as donor interest, international agreements, and political events; examined the role of key groups or policy champions, including NGOs like IUCN-The World Conservation Union; and observed the importance of disseminating information—through media reports, policy briefings, research reports, presentations, ministry documents, and site visits—to garnering government attention. The results demonstrated that the actions described in this article can mobilize political will on PHE issues.

Project partners set the policy agenda by framing the issues so that government bodies would be receptive. In this case, the links between gender and the environment were presented as a human rights issue. This was important for some countries, such as Costa Rica and El Salvador, as it highlighted international conventions to which their governments had subscribed.

International actors and partners played an important role by focusing attention on gender and environment. Donors from the Netherlands, the Canadian International Development Agency, and the World Bank worked with civil society for over four years on a number of collaborative projects. As a result, governments recognized the importance of gender and environment integration and started working with civil society actors on these issues.

Information and indicators helped create awareness. By presenting results from collaborative projects, civil society helped show policymakers how gender differentials affect environmental policies and programs.

Influentials, particularly policymakers, were involved from the beginning. NGOs worked closely with governments from the start: IUCN, for example, is an international organization whose membership is composed of governments and NGOs, and the Institute of Mexican Women, an influential NGO coalition, has worked closely with the Mexican government for many years.

Influential coalitions kept PHE issues on the policy agenda long enough. IUCN had already been working on gender and environment issues for five years when it was approached by government agencies. A large network of agencies, champions, academic institutions, NGO coalitions, a regional policy commission, and donors kept the gender and environment connection on the agenda long enough for policy to change. In all, it took eight years to convince the governments to incorporate gender into their environmental mandate.

These findings confirm that PHE experts can use a systematic process to influence policy:

- Raise awareness through targeted information dissemination;
- Set the agenda by getting policymakers to

recognize the importance of the issue; and
- Build coalitions by working with a variety of actors to keep the issue on the policy agenda long enough for change to occur.

This process may enable PHE programs to prioritize activities, establish benchmarks and indicators of success, and determine if efforts are sustainable.

Conclusion

When we link population policy and reproductive health interventions with environmental management, we improve our health, our economy, and our children's future. Researchers can, and must, educate policymakers and the public. Informed policymakers can address these complex long-term issues by implementing policies that balance far-reaching benefits with short-term costs. Local communities can empower themselves and effectively manage their environment, while simultaneously improving education, primary health care, livelihood opportunities, and the status of women. Ultimately, these approaches will help us match development needs with policy interventions in a rapidly changing world.

Notes

1. Close to 50 of these projects have been documented. See Riesenberger (2002, page 5); Engelman (1998); Vogel & Engelman (1999); and United Nations Population Fund (2001, pages 50-51).

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Networks of Threats and Vulnerability: Lessons From Environmental Security Research

RICHARD MATTHEW and BRYAN MCDONALD

Over the last 10 years, environmental security research has brought new ideas to the field of security studies; broadened our understanding of global change, conflict, and vulnerability; and explored the roles of conservation and sustainable development in promoting peace, stability, and human security. Today, another powerful new idea has emerged: national and international security agendas are focusing as much attention on "network-based threats"—terrorism, computer viruses, and epidemic diseases, for example—as on the perennial problem of war. If researchers reorient security studies to systematically investigate these transnational dangers, policymakers might be able to devise effective evidence-based solutions to the growing number of threats that do not follow the traditional state-centered security model. And this emerging field offers new lessons for environmental security research, revealing connections between processes of global change and deepening understanding of conflict and cooperation.

What is a network-based threat? Take, for example, climate change. People make decisions about their energy use based on their immediate social, economic, and ecological surroundings. These decisions constitute an informal web—a dispersed, transnational network[1]— of individual behaviors that ultimately combine to produce climate change, which has become a human and national security problem with uneven impacts across the world. This is demonstrated by the increasing frequency and severity of natural disasters, such as the floods that swamped 60 percent of Bangladesh in summer 2004 ("Battle to get aid," 2004; Logan, 2004).

Malevolent threat networks, such as global terrorism, share some structural characteristics with accidental threat networks like climate change: they are dispersed—therefore difficult to neutralize through negotiations or force—and they can accommodate and be amplified by diverse motivations. Although threat networks like climate change and global terrorism could be extremely dangerous and costly, it is hard to identify an effective mitigation policy, since no single incentive structure is likely to modify the behavior of all of a network's nodes; the net-

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work's effects vary across time and space; and the capacity to promote change is distributed unequally among states and non-state actors.

Environmental security (ES) scholarship provides important theoretical and methodological underpinnings for the embryonic field examining these threat networks. ES literature introduced an interdisciplinary perspective into traditional security practice, promoted the incorporation of security issues into mainstream endeavors like business and engineering, and explored the interactive dynamics of the diverse human and natural networks that constitute the modern world. While the ES field does not offer a suite of all-purpose solutions to transnational security challenges, it does provide useful analytical tools based on extensive research and debate. In addition, bringing together these fields can also help correct flaws in ES research, such as lack of engagement with the broader security community.

The New Security Landscape: Networks of Threat and Vulnerability

Most of the planet's terrain is now divided among 191 sovereign states,[2] many of which have achieved the security from internal conflict and external military aggression envisioned in Thomas Hobbes' seminal 1651 work, *Leviathan*.[3] For 300 years following 1648's Treaty of Westphalia, sovereign states aspired to self-sufficiency and viewed other states largely in terms of domination and balance. After World War II, however, these ideals were abandoned in favor of the United Nations system of formally sovereign states constrained by international law and mutually beneficial trade relations.[4] Michael Doyle (1983) and other scholars have argued persuasively that a "liberal zone of peace" has emerged: liberal states are democratic, respect international law, and engage in trade. They fight non-democratic states but not each other, thus creating zones of peace.

However, open democracy and trade have been a mixed blessing. Over the past several decades, the international and transnational networks linking states have grown more numerous and more sophisticated, propelled by rapid technological innovation and diffusion (Zacher, 1992). These networks have generated wealth, knowledge, power, and cooperation in ways that have improved the lives and enhanced the security of millions of people. However, they have also introduced threats and vulnerabilities, ranging from old-fashioned religious extremism to modern computer viruses, by empowering non-state actors through unprecedented access to information, communication systems, and transportation, resulting in a technologically accelerated political condition that we describe as "hyper-medievalism."

Rather than aggregating political and economic power within a defined territory, a hyper-medieval world is highly decentralized. Multiple stakeholders—from warlords to business cartels—compete effectively with states, which may fail due to corruption or ineffective law enforcement. Technology has reduced barriers to power accumulation, accelerating the start-up phase for new power-holders and injecting high levels of turbulence into the global system (Rosenau, 1990). Speed, knowledge, mobility, and reach are great assets for legitimate businesses and scientific research projects—but also for drug traffickers, timber mafias, human smugglers, terrorists, and identity thieves.

Transnational networks are not easily dismantled or neutralized. Investigative reports by PBS and ABC concluded that the war on drugs has placed 1.5 million Americans in prison and cost hundreds of billions of tax dollars, and yet it has not made a dent in the production, transportation, sale, or use of illegal drugs, which is valued at $300 billion to $400 billion a year (Schaffer, n.d.; Frontline, 2000; Stossel, 2002). As soon as one trafficker is arrested, another steps in; when pressure is applied to one country, production moves to another; and vast sums of money breed corruption in law enforcement at home and abroad. After 30 years of war, the enemy—the transnational network of drug traffickers—is

larger, richer, and more powerful than ever before.

Even perfectly respectable networks pose security problems when they transmit the negative effects of their legitimate activities across national borders. For example, currency traders in one country can trigger panic selling in others, as demonstrated by Southeast Asia's "financial flu" in the 1990s. Today, epidemiologists are concerned about diseases that could jump from animals to people and move rapidly across the planet to reach large populations in a matter of hours.[5] The Internet, a valuable tool for individuals and groups worldwide, is also susceptible to viruses and can be used by criminals and terrorists to commit fraud, launder funds, and share information.

Lessons From Environmental Security Research

The process of understanding network-based security issues, and effectively addressing them, is still in its infancy, but pioneering ES research has made significant contributions to this new field. The powerful criminal and terrorist networks that challenge security share characteristics with the benign transnational networks, such as waterways and forests, that ES researchers study.

Environmental security research brings together experts whose work initially developed along independent trajectories. Since the 1990s, social scientists, conservationists, and defense personnel have collaborated to understand the security implications of resource scarcity and abundance, environmental impacts of military activities, conservation practices' effect on conflict, and new asymmetrical conflicts at the human security level involving military or paramilitary assets.[6] Although unfinished, this work has generated practices and insights—like promoting interdisciplinary research and moving beyond the traditional security community—that can be applied to help understand and address other network-based security problems.

Promoting interdisciplinary research

Contemporary security requires expertise beyond the traditional grasp of senior military personnel and political scientists. Networks often bring together entities that share a goal or capability but otherwise differ in substantive ways. Contemporary terrorist networks, for example, are much more inclusive than the 20th century's close-knit groups. Al Qaeda can accommodate anyone with a grievance against the United States or its allies, or who sees participation as a way to accumulate resources or advance a more local agenda. Osama bin Laden may not be able to control all al Qaeda activities, but consequently, al Qaeda can survive massive disruptions of its leadership, funding, and training grounds. Understanding the threats posed by this type of dispersed, transnational terrorist network requires a range of diverse expertise:

- Understanding motivations requires psychologists, theologians, sociologists, political scientists, and criminologists;
- Understanding how capacity (e.g., recruits, funds, weapons, information, and media attention) is amassed requires businesspeople, scientists, and information technology specialists, as well as social scientists, law enforcement personnel, and military experts;
- Understanding the realm of opportunities available for terrorists requires people familiar with the inner workings of the internet, international business, and epidemiology; and
- Attacking the root causes of terrorism and developing effective countermeasures requires interdisciplinary research on a scale unfamiliar to the security community.

Moving beyond the traditional security community

Contemporary security studies should be included in business, medical, engineering, criminology, and computer science education

programs, so that specialists in these areas can examine the security implications of their practices. For example, every doctor should understand how the country is likely to respond to a lethal epidemic or chemical release, and engineers should learn how to design buildings that are less vulnerable to attack. Network-based threat analysis could provide valuable input for financial risk assessments and investment decisions,[7] and it could delineate the interdependence of internal and external national security problems for law enforcement and intelligence personnel.

Studying the dynamics of global networks: Examples

The interactive dynamics of networks—such as the environment, the market, and global terrorism—need to be analyzed via both quantitative and comparative case study methods, as in the following examples drawn from ES research in Nepal and Pakistan.[8]

In 1976 the Government of Nepal established the Koshi Tappu Wildlife Reserve in the eastern part of the country. This protected wetland, which became a Ramsar Wetland of International Importance[9] in 1987, lies along a 24-kilometer section of the Koshi River in an area known as the Terai. A portion of the area downstream from the reserve was leased to India so it could develop a dam. Settlers moved to this region to relieve pressure on the Kathmandu Valley and create a Nepalese presence along the border with India. The settlers, who relied largely on fishing and gathering, were displaced by the reserve and the lease. Now, they must eke out an existence in a remote, resource-poor region, vulnerable to any sort of shortage.

For the past decade, Nepal has suffered a violent conflict between Maoist insurgents and the government. The Maoists are very active in the eastern part of the country, where they have promised to return the reserve's land to the local residents. This rhetoric has mobilized sympathy and support for the rebels. Some analysts consider the Maoists a terrorist group that may be expanding its transnational links to left-wing groups in India, the Tamil Tigers in Sri Lanka, and other extremist groups in South Asia (South Asia Terrorism Portal, n.d.). Understanding the Maoists requires understanding the relationships among the world economy, which influences the Nepalese government's decisions, such as the lease to India; environmental stressors, like the migration from Kathmandu Valley and resource scarcity in the Terai; and regional strategic considerations, such as Nepal's vulnerability vis-à-vis India and, to some extent, China. Only this approach, common to ES literature, can adequately reveal the relationships that create, sustain, and strengthen a transnational threat network, and identify the pressure points for reducing the threat. In this case, improving settlers' livelihoods and legal protections, while preserving the conservation benefits through a sustainable use plan, might be a low-cost way to undermine support for the Maoists and a far more productive approach than the protected reserve.

The situation in the Dir-Kohistan region of Pakistan's North West Frontier Province provides another example of how ES research can be expanded to other transnational threat domains or used as a model for such analysis. Over 36 percent of Dir-Kohistan's 4,645 square miles is coniferous or oak scrub forest. It is one of the country's least developed areas, with an agrarian-subsistence economy, extremely low literacy rates (less than one percent for women), and little infrastructure. Traditionally, forest resources, which provide fuel wood, building materials, and other commodities, were allocated by the *nawabs,* or leaders, through a system of customary rights and principles that clearly favored the Kohistani over the region's other two ethnic groups, the Pathan and Gujar. Disputes were settled through ad hoc community councils known as the *jirga.*

In 1927 the British passed the Colonial Forest Act, which largely excluded local communities from the forests while granting some concessions to the Kohistani; Pakistan retained this legislation after independence in 1947. As

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Pakistan sought to gain control over its northern regions, the forests were largely ignored, but as their commercial value increased in the 1960s, they were leased to private contractors in return for generous royalty payments. When local people protested these terms, the government agreed to raise the community's share from 12 percent to 60 percent of the royalties. Unfortunately, due to widespread official corruption and the timber mafia's strong-arm tactics, local communities received very little as the forests were rapidly cleared in the 1970s.

In recent years, Islamic law has gained influence in Dir-Kohistan, especially among the Pathan and Gujar communities, which have adopted it in areas where they constitute a majority. Residents of Dir-Kohistan believe Islamic law is less biased than customary or statutory law and less prone to corruption. It is also more generous towards women, and thus appeals to the half of the population denied legal standing for centuries. From the perspective of many outsiders, the rise of Sharia law indicates a capitulation to Islamic extremism and creates a safe haven for Taliban and al Qaeda supporters. There is no doubt that this conflict-prone region includes some supporters of these transnational threat groups, but it is equally true that a combination of environmental scarcity, failed legal systems, and government corruption created conditions under which Islamic law became the only support system for many local residents. To successfully address threat and security issues in Dir-Kohistan, as much—if not more—attention should be given to improving sustainable livelihoods, education, and law enforcement, as to rounding up drug traffickers, offering bounties, and imposing sanctions. The security policymakers' knowledge of this region is not often based on the fine-grained field research undertaken by ES scholars. Following this trajectory might lead to more effective and less costly policies that undermine transnational terrorism by providing viable opportunities for sustainable employment and justice.

Lessons for Environmental Security

Since the mid-17th century, and especially since World War II, the field of security studies has been constructed to investigate and help resolve the problem of interstate war. Today, transnational threat networks present as great a challenge to national and human security as war, as ES researchers argued in the 1960s, 1970s, and 1980s.[10] After a dramatic growth spurt in the 1990s, ES has produced a body of theoretical and methodological insights into the study of other network threats, as discussed above.[11]

The study of network-based threats also offers lessons *for* environmental security. For example, a full analysis of a threat system like global terrorism will probably reveal connections between the network and global environmental processes, which may lead to ideas for viable interventions. In addition, the ES literature could close some of its internal gaps by engaging the broader security community on concepts such as threat, vulnerability, conflict, and cooperation.[12] ES researchers often resist responding to the extensive literature on conflict and cooperation, and reduce this complex world to a meta-variable (e.g., undifferentiated "social factors") that affects the relationship between the environment and conflict. Thus, network-based threat analysis could provide ES researchers with a way to deepen their understanding of security theories.

Over the next 10 years, as the United States and many other countries struggle to come to terms with new threats and vulnerabilities, ES research could support the development of an emerging field that may transform our understanding of human and national security, while reaping its own beneficial insights into new networks of conflict and cooperation.

Notes

1. There is no consensus on the definition of "network" or how to distinguish it (if necessary) from "system." Here, we use the term network in its most elemental sense: "an interconnected system of things or people" (retrieved on August 17, 2004, from Word

Net: http://www.cogsci.princeton.edu/cgi-bin/webwn?stage=1&word=network).

2. The United Nations (2004) has 191 members. The United States recognizes 192 states: UN members plus Taiwan (U.S. Department of State, 2004).

3. Partially inspired by England's violent civil wars, *Leviathan* envisioned the sovereign, territorially delimited state as the optimal arrangement for maximizing human security. Europe could escape the strangling grip of its royal families and the Catholic Church, Hobbes argued, only by centralizing political power and demarcating the precise territorial limits of its jurisdiction.

4. As of April 2004, 147 states belong to the World Trade Organization.

5. This possibility was demonstrated by the rapid emergence and spread of Severe Acute Respiratory Syndrome (SARS) in 2003 (Centers for Disease Control and Prevention, 2004).

6. On resource scarcity and security, see Thomas Homer-Dixon (1999); on resource abundance and security, see Gleditsch and de Soysa (1999); on the environmental impacts of the military, see Hawley (1992); on the security implications of conservation practices, see Matthew, Halle, and Switzer (2002); and on the human security implications of asymmetrical war, see Benini and Moulton (2004).

7. For example, businesses are wary of investing heavily in climate change mitigation. Training designed to accurately measure the costs of such security risks might overcome this reluctance; see "Most U.S. Industry Giants Ignoring Global Warming" (2003).

8. These examples are based on a study of livelihoods, resources rights, and conflict in Nepal, Pakistan, Bangladesh, and Sri Lanka, led by IUCN South Asia. Co-author Richard Matthew is a senior consultant for this study. Information about the project is available on the IUCN website (http://www.iucn.org/places/asia/livelihood/index.html) and findings will be published in an edited volume in 2005.

9. The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that promotes international awareness and cooperation for the conservation and wise use of wetlands and their resources; see http://www.ramsar.org/ for more information.

10. See, for example, Ophuls (1976), Brown (1977), Ullman (1983), World Commission on Environment and Development (1987), and Mathews (1989).

11. See, for example, Connor (2004) and Physicians for Social Responsibility (2004).

12. For more discussion of the gaps in ES research, see Matthew, Brklacich, and McDonald (2004).

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