Why Environmental Transformation Causes Violence: A Synthesis

by Günther Baechler

CORRELATIONS BETWEEN TRANSFORMATION OF SOCIETAL-NATURE RELATIONSHIPS AND VIOLENT CONFLICTS ARE NUMEROUS. This analysis will examine the critical role of transformation regarding *causation* of environmental con flicts in certain areas of developing countries. One has to build on prepared empirical ground to highlight different patterns of causation, to select types of environmental conflicts in terms of different pathways leading to violence, as well as to stress the sociopolitical characteristics of environmental conflicts.

The empirical ground for the following typology has been provided by the Environmental Conflicts Project (ENCOP). This international research project has focused on the interrelationship between environmental degradation, maldevelopment, and violent conflict. Forty area studies were carried out by a permanent research team based in Bangladesh, Germany, Great Britain, Nigeria, and Switzerland. Additional regional specialists and inhabitants of the countries under consideration also contributed to the case studies.[1]

The study group adopted a working definition of environmental conflicts in order to narrow the focus of the globally oriented study. According to this definition,

environmental conflicts manifest themselves as political, social, economic, ethnic, religious or territorial conflicts, or conflicts over resources or national interests, or any other type of conflict. They are traditional conflicts *induced by environmental degradation*. Environmental conflicts are characterized by the principal importance of degradation in one or more of the following fields:

- overuse of renewable resources;
- overstrain of the environment's sink capacity (pollution);
- impoverishment of the space of living (Libiszewski 1992:13).

Two concepts led to this definition. First, the study group assumed that both structures and actors played roles if and when environmental problems contribute to conflict. Taken together the two determine the type of conflict that is triggered by environmental issues. Second, it focused on renewable resources and excluded minerals and non-renewable resources. However, if mining, dam building, or industrial activities directly or indirectly led to widespread disruption of landscapes, then these conflict-prone activities constituted cases which fit into the definition.

After completing the ENCOP investigation, it is clear that neither apocalyptic scenarios of environmental catastrophes nor alarmist prognoses of world environmental wars are tenable. Environmentally-caused conflicts escalate across the violence threshold only under certain conditions. Human-induced environmental change can be either a contributing or a necessary factor to both the emergence and/or the intensification of violent conflicts. On one hand, violent conflicts triggered by environmental disruption are due in part to socioeconomic and political developments. On the other hand, social and political maldevelopment, due in part to degradation of natural resources, has become an international peace and security challenge. *Development and security dilemmas* are connected to a syndrome of problems which produces environmental conflicts of varying intensity and nature.

The discussion that follows explores the specific triggering and inhibiting factors which determine conflict behavior. The framework for this discussion is a typology of conflict levels and parties to conflict, and a generalizable examination of the environmental role in causing conflict and in intensifying current conflicts. More details on the specific ENCOP cases can be found in the appendix.

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1. Environmentally Caused Violence: A Phenomenon of Developing and Transitional Societies (Hypothesis One)

Environmental conflicts[2] are caused by certain ecological problems of particular intensities. Yet these conflicts remain social and political events. Therefore, several attributes of conflict must be considered together for a complete explanation of environmental conflicts: actor characteristics, interests, actions, and outcomes based on those actions. The first hypothesis holds:

Violent conflicts triggered by the environment due to degradation of renewable resources (water, land, forest, vegetation) generally manifest themselves in socioeconomic crisis regions of developing and of transitional societies if and when social fault lines can be manipulated by actors in struggles over social, ethnic, political, and international power.

The ENCOP cases provide ample evidence for the assumption that developing and transitional societies —or, to be more precise—discriminated groups within those societies, are most affected by interactions between environmental degradation, social erosion, and endemic violence. Crisis areas susceptible to conflict are found in 1) arid and semi-arid plains (drylands); 2) mountain areas with highland-lowland interactions; 3) areas with river basins sub-divided by state boundaries; 4) zones degraded by mining and dams; 5) tropical forest belts; and 6) poverty clusters of sprawling metropoles. In these sensitive areas found in Africa, Latin America, Central and Southeast Asia, as well as Oceania, traditional society-nature relationships, regulated by cultural-specific approaches to the environmental problems, are acutely at risk.

All those conflicts have in common the phenomenon of marginalization of one or more actors. One major exception exists: inter-state conflict over shared river basins. Although there are cases where conflicts between upper and lower riparians occur in marginalized ecoregions of neighboring states, *e.g.*, Eastern Anatolia in Turkey versus Syria and Iraq, in most cases geopolitical and strategic security issues stand in the foreground. Disputed water resources and rural development issues, (*e.g.* the farmers in Syria and Iraq), are shoved into the background. These priorities apply especially for regional water conflicts in the Middle East that transpire within the framework of historic territorial conflicts.

However, conflicts induced by marginalization of certain groups share the problem of discriminatory access to natural resources. Thus the concept of environmental discrimination is crucial to all the conflicts under consideration. *Environmental discrimination occurs when distinct actors—based on their international position and/or their social, ethnic, linguistic, religious, or regional identity—experience inequality through systematically restricted access to natural capital (productive renewable resources) relative to other actors.*

The conflict geography of environmental conflicts corresponds largely with that of regional conflicts. Conflicts tend to occur in the South, a pattern observed since World War II. In fact, the number of armed conflicts immediately after 1989 has risen sharply due to the collapse of the Soviet Union. In the early 1990s conflicts occurrence in the Eastern transitional societies has again ebbed slightly, and since 1994-95, a decline has taken place in the total number of violent conflicts and wars. This development notwithstanding, the number of ongoing violent conflicts in the South—particularly those of low intensity—is still high and probably increasing due to links with maldevelopment. This judgment results from various regional analyses which, in contrast to conventional war registers, include the assessment of unrest leading to bloodshed as precursors of environmental conflicts. For example, in Central Asia a number of such incidents of unrest have already taken numerous human lives but are not registered in available databases (*e.g.*, Fergana Valley). Additional relatively low-level conflicts of this kind will likely escalate either in the short intermediate term. In these cases, environmental crisis serves as an indicator of likely state failure and thus expected major conflict (*e.g.*, Northern Ghana).

Most environmental conflicts are carried out between actors within a country (*see: fig. 1, A and appendix*). In some cases, internal conflicts become internationalized (*see: fig. 1, B*). Most of those that do spread across borders involve migrants or refugees coming from war-torn or marginal rural areas of a neighboring country. Seeking fertile land or jobs, they cause political, social, or ethnopolitical conflicts outside their region of origin. The internationalization of internal conflicts can also be the consequence of new states created after the collapse of an empire. With the dissolution of the Soviet Union, for instance, the new Central Asian republics now face water distribution conflicts which suddenly have become international conflicts.

Finally, there are environmental conflicts between states which from the very beginning have an international dimension (*see: fig. 1, C*). Those conflicts may result from degradation of regional environments or the global commons. Contention surrounding ozone layer depletion and climate change (including sea level rise) are political conflicts with no major military dimensions to date. But today, international disputes arise especially between nations mutually dependent upon the cooperative use of international river basins. Although the cases examined in the ENCOP studies did not result in violent clashes, considerable potential for military actions persists among some upper and lower riparians (Baechler *et al.* 1996:158-165).

Distinguishing between the three levels A (internal), B (internal with interstate aspects), and C (inter-

state) only serves as a rough orientation to environmental conflict. The boundaries among the levels are literally fluid. Classifying a given conflict at just one level, especially over time, is often impossible. Internal conflicts may be fueled by international events, whereas the latter may be the result of an escalating domestic war. A further fine-tuning is therefore needed. It is necessary to relate the type of environmental degradation to socioeconomic change and to parties to the conflict, herein referred to as *actors*. Seven ideal types of environmental conflict can be distinguished: I. ethnopolitical conflicts; II. center-periphery conflicts; III. regionalist migration/displacement conflicts; IV. transboundary migration conflicts; V. demographically-caused conflicts; VI. international water/river basins conflicts; and VII. international conflicts arising from distant sources due to neocolonialist exploitation of resources (the latter conflict is seen as a variant of center-periphery conflicts). Sometimes it is difficult to decide under which category a given conflict is best listed. Rwanda, for instance, maybe type AII (ethnopolitical conflict) or BVI (demographically-induced conflict). However, for analytical clarity, each case is listed in only one category.

There is no intention to provide empirical details concerning the cases here. An encompassing table including the list of the cases related to each individual type of conflict, the indication of the environmental dimension of the conflict, the parties involved, and the conflict intensity can be found in the appendix. The following synthesis of the case studies carried out in the framework of ENCOP refers to the cases included in this table. They provide the empirical background

in many cases analyzed by ENCOP. Conflicts emerge because 1) two or more ethnic groups share one ecozone with degraded and thus unproductive resources, or 2) ethnic groups depend on neighboring ecozones with highly distinct degrees of productivity. In the first configuration, conflicts escalate because one or more ethnic groups have limited access to needed natural resources. In the second set of conditions, violence occurs if and when the environmentally discriminated group invades the territory of the neighbors who are environmentally better off.

Similar to the center-periphery conflict (*see: 1.2*), ethnopolitical conflict represents a modernization conflict at its core. The difference is that the fault line does not run between a defined center and its periphery. Instead, the cleavages for ethnopolitical conflict run along group-specific traits within ethnically fragmented societies. In a few cases, population pressure on an ecologically sensitive region beset with scarce and degraded resources contributes to the hardening of inter-ethnic relations (*e.g.,* Rwanda; Bangladesh versus Assam Province in India)(*see: appendix, BV. 25*).

Overuse of land, forest, and fresh water resources lead to ethnopolitically motivated conflicts if and when they combine with certain geographical and climactic factors. In many areas of rural societies, for instance, the traditional dualism between subsistence farming on one hand and (semi-) nomadic livestock breeding and large-scale ranching on the other, is at stake. Since the two different producer groups belong usually to distinct ethnic or indigenous communities, the competition over resources becomes the core of an ethnopolitical conflict. What colonialism was not able

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Table 1

Taxonomy of environmental conflicts according to the different levels in the international system

Conflict Levels:	Adversaries:
A: internal	identity group* vs. identity group government vs. identity group government vs. migrants/refugees
B: internal with inter-state aspects/internationalized states	government (and local population) vs. immigrants from third states
C: between states	government vs. government (international) government vs. IOs/INGOs

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for the *generalizations* provided in this article.

1.1 Ethnopolitical Conflicts (Type AI)

Environmental and ethnic discrimination coincide

to do, the present struggle for fertile land definitely achieves: it opens up ethnically preserved environmental "niches" of groups that used to live generally apart. Owing to intensive use of both ecologically favorable areas with high fertility and unfavorable areas with low

fertility by a growing number of rural producers, ethnically defined living space is giving way to ethnic mixing and social stratification. This process, which largely contributes to new clusters of ethnic groups facing environmental discrimination, is triggered by degradation of scarce resources. It may also be aggravated by modernization processes, on-going protracted violence or wars.

The competition over degraded lands has another dimension that overlaps with center-periphery conflicts. Huge areas of the most fertile land are under cultivation for monocultures (food and most often cash crops), or are serving commercial purposes of central governments (such as Wildlife Parks). As a result, increasingly less productive land remains exclusively for labor intensive food crops. Rural populations put pressure on available land and further stress the landscape. However, identity groups—whether tribes, clans, or ethnic groups—are in general not willing to surrender land which they claim as the land of their ancestors. Historically land use and land tenure disputes have led to deliberate violent measures. But only recently such traditional conflicts have been aggravated by the negative ecological impacts of maldevelopment in the rural sector throughout the developing world. Both environmental discrimination against identity groups as well as the availability of modern small arms have made these conflicts even more brutal (*see: appendix*, *AI.1-6*. Case studies by Baechler 1996II: 461-502; Klötzli 1996II: 247-336; Lume 1996III: 175-202; Suliman 1996II: 109-180).[3]

1.2 Center Periphery Conflicts (AII)

Relationships between members of the center and the periphery in developing countries often assume precarious forms owning to environmental transformation. National elites and international investors in the modernizing centers have certain economic, environmental, and energy policy preferences as well as opportunities at their disposal because of their access to resources including power. At the same time, the socioeconomic opportunities for most levels of the rural population prove to be extremely limited. Areas inhabited by poor rural dwellers are indeed often environmentally vulnerable and degraded. Environmental degradation also contributed to the development of rural and (per-) urban poverty clusters by undercutting health conditions, constraining productivity, and shortening time horizons for adequate reactions. A lack of resources makes it extremely difficult for the poor to escape the environment risks or to invest in risk-reducing and income-generating strategies (see section 1.4 on cross-border migration conflicts).

The catalysts to escalate center-periphery conflicts are primarily large cash crop farming projects, dams, and mining. Globally-oriented companies pursuing capital intensive, high-technology and high-energy projects are confronted with identity groups dependent on natural capital with low or no commercial energy input. The clash is heavily conflict-prone if and when the society-nature relationship for an area that has had little or no integration into the market economy, is transformed by third party economic interventions that run counter to rural dweller's interests and preferences. Mechanizing, collectivizing or, depending on the region, privatizing the rural economy marginalizes traditional cultivating methods, land-use patterns, and land tenure systems. Landscape erosion through soil and water degradation from large-scale commercial farming, mining, and industries erode living orders for peripheral populations.

Actors highly dependent on the disputed natural capital but facing environmental discrimination see themselves as prisoners of modernization or of structural heterogeneity respectively. In poor countries modernization seldom provides valuable off-farm opportunities. Only relatively few among rural dwellers — which constitute up to 95 percent of least developed country populations — find regular incomes in the commercial sector. Still fewer receive financial compensation for the loss of natural capital or for being forced to use marginal land. Quite often companies and central governments break promises on the positive impacts of huge projects. Marginalized groups endure more discrimination through project-driven transformation of the environment. Modernization without participation makes them feel more disadvantaged materially, socially, culturally, and spiritually than ever before. Intensified rivalry for scarce water, shrinking settlement areas, and protective soils belong to the inevitable consequences of this maldevelopment.

Center-periphery conflicts differ greatly depending on the degree of periphery dependence on the center and the level of underlying power asymmetry. In contrast to dam or mining projects, the interdependence between center and periphery concerning agricultural and irrigation projects is usually high. If necessary, mines or dams can be protected militarily; large areas of irrigated land cannot.

There is an international variant of center-periphery conflict (*see:* C.VII). Whereas the center-periphery conflicts discussed above pit national elites (governments/economic sector) and international firms versus less powerful populations, the international type sets outside powers against developing country governments. Severe conflicts surround *neocolonial exploitation* of the natural environment against the will of the governments of an affected region. Since the power asymmetry among the two actors is significant, the escalation potential of this kind of global conflict is minor in comparison to the environmental problem it creates. Concerning the only such example analyzed by

ENCOP, namely the French nuclear tests in the Pacific, the worldwide protests were relatively moderate. Bloody violence and direct confrontation between the French army and protesting groups (including Greenpeace), however, occurred only in Polynesia, *i.e.*, in the immediate neighborhood of the nuclear explosions. The conflict was contained in the local arena far from the center of the globally acting player, France. Although this kind of globalized center-periphery conflict is an exception (Bhopal in India and other "accidents" did not have the same level of global response), it is indeed not inconceivable that in the near future asymmetric socioeconomic impacts of climate change, ozone layer depletion, and sea level rise will lead to similar constellations (*see appendix*, A.II.7-19*)* Case studies by Böge 1996II: 503-720; Claus 1996III: 269-2645; Okoh 1996II: 181-246; Schönenberg 1996III: 315-358; Schwark 1996III: 359-408; Wegemund 1996III: 285-314; König 1996III: 149-174; see also Böge 1993; Carino 1993 (manus.); Quimpo 1993 (manus.)).

1.3 Internal Migration Conflicts (Type III)

Internal migration conflicts are triggered by either voluntary migration or forced displacement of inhabitants from one region to another within one country. The geographic origin of migrants or displaced persons is the primary criterion for conflicting social and political relationships between the actors. Migration is induced by structural changes such as persistent drought, flood, and soil erosion (desertification). Its direction leads from depressed areas to more favorable zones such as fertile rural or (peri-) urban areas. Although both push and pull factors work together, the push factors are stronger. Forced displacement and expulsion, on the other hand, are due almost entirely to push factors that often appear in connection with large (agro-) industrial, mining, and dam projects.

Inter-regional migration and displacement—as a special type of internal dislocation—pit people of the same ethnicity from different regions against each other. The most important fault lines are those between highlanders and lowlanders, pastoralists and farmers, rural and urban population. Mountaineers for instance, drawn downwards by the quest for jobs, income, and land, get caught in competitive situations with indigenous populations. The distinct society-nature relationship of newcomers and settled populations triggers tensions, clashes, and in some cases violent conflicts.

Thus a myriad of social interactions emerge. In locally overpopulated and degraded mountain regions with nomadic cultures and few off-farm opportunities, environmental degradation and stress prompt major migration waves into irrigated areas and into urban fringe with resident farming cultures. Integration of former livestock breeders is difficult in large irrigated areas with monocultures (*e.g.*, Himalayan pastoralists

in the plains of Central Asia). On the other hand, farmers also migrate from eroded highlands into fertile valleys settled by semi-nomads (*e.g.* in the Horn of Africa). Thirdly, conflicts emerge if semi-nomadic pastoralists flee from persistent drought and soil erosion to semi-arid and subtropical mountain regions settled by farmers (*e.g.*, in Sudan).

The basic patterns of these three interactions between highland and lowland residents are comparable. Inter-regional migration conflicts are in part determined—as are the other conflict types discussed here—by environmental discrimination against actors who are heavily dependent on scarce natural resources. A second factor of significant influence is poor state performance[4] in marginal areas. High dependence on natural capital combined with poor state performance are two main reasons why discriminated groups are attracted to rich rural areas and country capitals. These two factors are critical in countries with great regional disparities not offset by the rule of law and democratic mechanisms. However, poor state performance is also an inhibiting factor for large-scale migratory movements, namely in cases when poor state performance coincides with illegitimate and oppressive regimes that have been able to put vast territories under military control (*e.g.*, the Kurds in various countries).

Inter-regional conflicts are commonly confined to local arenas and cover neither the entire country nor the core of state power. Violent conflicts (skirmishes, clashes, and riots) occur in disputed rural zones. Some conflicts spread to (peri-) urban arenas and blend in with violence and criminal gang behavior, at times involving former soldiers or mercenaries. Inter-regional migration or resettlement lead to political struggles for state power if and when groups that had been discriminated against succeed in penetrating the ruling elite or driving it out of power in other ways (*see: appendix, AIII.20-23*. Case studies by Faath 1996III: 203-268; Schönenberg 1996III: 315-358; Smil 1996III: 127-148; Melber 1996III: 409-440).

1.4 Cross-Border Migration Conflicts (Type BIV)

When migrants or refugees cross national borders voluntarily, resettle in rural border areas or resettle in cities of a third country, they represent socially and at times politically orchestratable conflict potential. Even though the term "environmental refugee" is rejected by the United Nations High Commissioner for Refugees (UNHCR), the linkages between migration and environmental discrimination have been acknowledged by UNHCR head Sadako Ogata (Ogata 1994:41-47). UNHCR is concerned with environmental disruption as a serious consequence of large refugee movements (mainly in large camps depending on fuelwood). However, transformation of the environment is itself a reason for migration and flight. Migrations channeled

by environmental discrimination intensify conflicts where the economic situation is eroding and political instability deepens lines of conflict. In some cases the use of violence opens pre-colonial divisions between rival identity groups.

Environmentally-induced migration normally takes the form of slow infiltration over a long period of time. People move into areas that either permit survival or provide favorable living conditions. Only in exceptional situations such as acute drought do massive flights occur spontaneously. The escape routes are diversified. In many regions it pays to cross the national frontier because more favorable foreign destinations lie geographically nearer than the remote capital of one's native country. Frustration and despair can explode into violence in host countries or transboundary regions populated by hostile identity groups or by earlier migrants from common identity groups who show hostile behavior toward the newcomers. Occasionally the routes also lead to the northern industrial countries.

The following key factors hold for both internal migration and displacement as well as cross-border migration and flight.

1. *Problems arising from poverty and poor state performance:* As mentioned above, the largest proportion of populations in developing countries settles in rural areas. Some poverty clusters suffer not only from environmental discrimination but also from insufficient infrastructure, unclear or competing land ownership, sub-division of already small plots, and lack of credits. Phenomena as varied as soil erosion, heavy rains and flooding, drought, salinization, deforestation and woodland clearing, and overgrazing of savannas accelerate the dissolution of traditional living orders. Such living orders include specific ensembles of economy, culture, neighborhood, and kinship groups (families, lineages, and clans). Reaching a point of no return, people have no choice but to give up their homestead. At the same time market economies absorb only a few rural dwellers who are drawn out of their traditional environment. The market induces a highly selective dissolution of traditional structures. Thus landscape degradation belongs to the very transformation that has produced most of the migrants and refugees leaving their degraded environment to date.

2. *Problems arising from modernization:* Problems of modernization include mechanized farming, mining, and urbanization. The various side effects of these activities—such as a total loss of land, the use of fertilizers, salinization, and pollution—encourage rural dwellers to withdraw. They have in fact only two alternatives: either move to more marginal lands and clear them, or join the marginalized in (peri-) urban areas. Shrinking lakes (Aral Sea, Lake Chad), flooding, irri-

gation, loss of biodiversity and the spread of epidemic diseases force resettlement, expulsion, and escape.

3. *Problems arising from the location of population growth:* Population growth occurring in marginal areas creates more potential victims of natural events (such as landslides, earthquakes, and volcanic eruptions). These perils are incorrectly perceived as "natural catastrophes" and not "social catastrophes."

A conflict-prone situation worth mentioning is the intercontinental migration from southern to northern continents. Along the North-South fault lines, industrial countries are trying to stop the entry of illegal immigrants and to facilitate their return. Some of the migrants come from environmentally degraded areas and can be viewed as victims of a globalized resource distribution conflict. As a rule, however, refugees from environmental degradation lack the necessary resources and health for long and costly trips. For this reason, the destinations of most migrants and refugees commonly lie close to home. If one pursues the route of a migrant from his homestead to his possible destination in an industrial country, conflicts occur at various stops along the way: in neighboring ecological regions, in the national capital, in the space just across the national border, in third countries, and only in few cases in other continents. Various obstacles represent significant inhibiting factors for large-scale and long-distance migration (*see: appendix, AB.IV.24.* Case studies by Faath 1996III: 203-268; Baechler 1994; Gallagher 1994:65-72; Ogata 1994:41-47; Suhrke 1994:93-100).

1.5 Demographically Caused Migration Conflicts (Type BV)

High population pressure in ecozones of low productivity causes either local conflicts or migration, which can lead to, conflicts in the area of destination. Demographic developments matter for environmental migration conflicts in three different ways: population scale in relation to resources available (density), population growth rate, and resource redistribution through migration and displacement. It is difficult to highlight the causal linkage among population pressure, environmental degradation and violence. Yet in a few cases (Rwanda, Bangladesh/Assam, and Indonesia/Java), ample evidence suggests that such connections do exist.

The repeated sub-division of land into smaller and smaller inheritance shares is an indicator for these connections. Fragmented arable land, decreasing yields per hectare, and a lack of off-farm alternatives coerce large parts of the rural population to migrate toward urban areas where conflict potential increasingly accumulates. This potential relates to land use and distribution in growing peri-urban areas as well as the environmental decline in mega-cities (Girardet 1996:67-115).

Another indicator of demographically induced migration is the clearing and cultivation of new land in remote mountains, in deltas, and in ecologically sensitive coastal areas. Landless people and semi-nomads gradually move into protected zones in urban areas or into national parks. Social unrest can recur as these movements provoke clashes with governmental troops and contribute to politically unstable situations (*e.g.*, the Maasai in Kenya and in Tanzania). Acute conflicts occur if the discrimination is perceived as tremendous by the actors affected. The threshold for discrimination depends greatly upon the perception and varies from case to case. Generally speaking, discrimination is perceived to be unacceptable when social and/or ethnopolitical factors accumulate, facilitating group identity building (*e.g.*, between Bengali immigrants and residents of Assam province in India).

Population dynamics accelerate the impact of other key factors such as poverty, inadequate land use and land tenure systems, environmental transformation, and poor state performance. This constellation of factors encourages cross-border migration, which—in the context of violent coups and civil wars—assumes the form of mass flight, (*e.g.*, in the Great Lakes region in Africa) (*see: appendix, B.V. 25-27*. Case studies by Hafiz/Islam 1996II: 1-108; Ehrensperger 1993 (manus.)).

1.6 International Water Conflicts (Type CVI)

International river basins are the most obvious example of the general contradiction between ecoregional boundaries and state borders. The asymmetric dependence of upper and lower riparians on an international river basin triggers political tensions, international bargaining, and military threats. Since lower riparians are more vulnerable than upper riparians they can easily receive discriminatory access to fresh water resources. River pollution and water distribution conflict are distinct problems. The former refers to the substantial degradation of resources, whereas the latter refers to economic scarcity. Pollution conflicts are represented as strife over an indivisible public good that affects levels of pollution, political responsibilities, and economic costs. Since neighboring riparians have a vested interest in solving pollution problems cooperatively—in win-win solutions—such conflicts are easier to resolve than those over access to the resource per se. Distribution conflicts turn out to be conflicts over divisible public goods. They are perceived as zero-sum games. Discriminatory access to scarce water resources affects national sovereignty and integrity more directly than pollution. Both pollution and distribution can obviously appear in combined forms which complicates the search for cooperative solutions.

International conflicts over water use develop in the context of strong riparian interest in securing access to the shared water resources, of asymmetric power distribution among riparians, and of the quality of the multilateral relations generally. Conflict dynamics also depend on climatic and geographical conditions, population growth, the economic structure, and the state ability to cope with vulnerability. Therefore, in addition to given hydrologic conditions, the political and socioeconomic *milieu* is of central importance for settling international water conflicts. There is no direct linkage between water pollution and distribution on the one hand and the intensity of conflicts; it is the political context that matters.

In regions that suffer from seasonal drought if not from permanent water crises (*e.g.*, the Middle East), distribution and discrimination are highly sensitive issues, which are treated as threats to national security. Because water flow is easy to manipulate by riparians of a shared basin, scarcity conflicts in crisis-prone regions inevitably get mingled with other contributing factors. But the example of the Arab-Israeli peace process shows that negotiations about water management are possible even under conditions of acute scarcity on one hand and protracted conflict on the other. This process is possible because all actors perceive water issues to contribute to no-win solutions. On the other hand, water talks can easily be canceled if and when the political situation changes.

There is no automatic spiral toward violence. To date no open wars have been caused by water distribution issues alone. Even in arid zones where states are extremely dependent on external water resources (Egypt), there has been a balance, albeit a precarious one, between threat and cooperation. The geographic course of a river is a power factor worthy of attention. If a country is the upper riparian and well-equipped militarily, it holds all the trump cards. It can discriminate thoughtlessly against lower riparians through regulating the cross-border water flow. If superiority is overwhelming, cost-benefit analysis will keep lower riparians from engaging in a war-like dispute despite the discrimination. The presence of a hegemon controlling the sources of a basin have a thoroughly stabilizing effect if the power demonstrates some flexibility and furnishes competence to enable mutually satisfying technical solutions (*e.g.*, to some extent USA-Mexico concerning the Rio Grande and Colorado River Basins).

Within the context of institutionalized and cooperative relations, power relationships are mediated by legal barriers and rules of behavior derived from custom. The best case scenario for avoiding the escalation of water distribution and pollution conflicts are regimes which focus on current realities. Therefore, water conflicts in and between industrial countries are settled with peaceful means because of the parties' high degree of negotiating competence and existing regulatory mechanisms at the policy level (see for instance the dispute settlement capacities of the Rhine Commission in Western Europe). Environmental conflicts become a

catalyst for cooperation if political compromises are seen as desirable and technical solutions as feasible. Successful compromises or even institutionalized mechanisms of dispute settlement reduce the danger of water-use conflicts racing out of control.

Only if water issues coincide with extremely unfavorable political conditions will they become a trigger of warlike actions (*e.g.,* between Israel and Syria in the prelude to the Six-Day War). The asymmetrical geographic positions in the basin then come into play as the upper riparian puts pressure on highly vulnerable neighbors. Some water related conflicts coincide with center-periphery conflicts. If dominant riparians turn out to be authoritarian regimes with poor state performance, water issues further delegitimize central governments in the eyes of discriminated groups which are highly dependent on water for agriculture (*e.g.,* Kurds in Anatolia, Syrian and Iraqi farmers below Turkish dams on the Euphrates and Tigris rivers). On the Indian subcontinent, river basin conflicts are imbedded in a context marked by extreme poverty, ethnopolitical schisms, and the hegemonic demands of a regional power. These factors induced sociopolitical conflicts within the lower riparian Bangladesh or between Bengali migrants and inhabitants of the Indian Province Assam (*see: appendix, CVI. 28-39*. Case studies by Baechler *et al*. 1996: 117-166; Gleick 1996III: 1-26; Hafiz/Islam 1996II: 1-108; Klötzli 1996II: 247-336; Libiszewski 1996II: 337-460; Okoh 1996II: 222-232; Rogers 1996III: 25-64; Thomas 1996III: 65-126; Wegemond 1996III: 285-314; Baechler 1997; Durth 1993; Klötzli 1993).

1.7 Global Environmental Conflicts (Type CVII)

Climate change and stratospheric ozone depletion demonstrate the globalization of environmental transformation. Globalization is considered to be a rather conflict-prone process by various authors (Myers 1993; Renner 1996). Predicted developments towards a global environmental conflict formation notwithstanding, specific statements about the socioeconomic and ecological effects of climate change cannot be made based on the case studies carried out in the framework of ENCOP (Baechler et al. 1996: 329-332). Socio-politically significant sea level rise, for instance, will be a phenomenon of the intermediate and long-term future. Continuing drought in the arid and semi-arid zones is not clearly attributable to the anthropogenic climate change. Nonetheless, international concerns (e.g., the global campaign of the Small Island States) indicate that there is potential for future conflict. Due to the development dilemma, the victims of global transformation will be found where environmental discrimination has already provoked a precarious situation. If current conflicts can be traced back to global environmental phenomena at all, they presumably concern mainly

domestic conflicts of types AI (center-periphery conflicts), AII (ethnopolitical conflicts), and AIII (internal migration conflicts). In other words, acute conflicts do not arise along the great fault line between North and South, but rather where climate change contributes to the collapse of local rural structures and regional political authorities.[5]

1.8 Conflict Types. Conclusions

Discrimination against actors in sensitive ecological areas and a high level of dependence on natural capital are two key factors determining the conflict potential of transforming society-nature relationships. Conflicts about degraded renewable resources manifest themselves as international, center-periphery, inter-regional, and group identity struggles exacerbated by migration and displacement, and in some cases accelerated by population dynamics. Actors with access to state power typically have access to the most productive areas whereas identity groups facing environmental discrimination are forced to use and degrade marginal arenas with low productivity, thereby perpetuating impoverishment. Additionally, groups against which environmental discrimination works are confronted with environmental deterioration *beyond* their control: deforestation by loggers destroys the livelihood of indigenous forest dwellers, dam building degrades land both upstream and downstream, mining leads to widespread contamination of the landscape, and industrial water pollution leads to the depletion of inland and coastal fisheries.

The hypotheses of the Environmental Change and Acute Conflict Project (ECACP) co-directed by Thomas Homer-Dixon are basically confirmed by the cases evaluated above (Homer-Dixon, 1991; 1994). There is indeed little empirical support for the first hypothesis that environmental scarcity causes violent conflicts or wars between states. Thus alarming statements such as "water wars" or "green wars" definitely are to be questioned. Environmental conflicts tend to be "persistent, diffuse, and subnational." (Homer-Dixon, 1994).

Simultaneously there is substantial evidence to support the second hypothesis that environmental scarcity causes large population movements, which in turn cause conflicts. There is only one finding where ENCOP results differ from ECACP. While Homer-Dixon suggests a linearity between large population movements and group-identity conflicts, ENCOP suggests that migration is linked to different kinds of conflicts: socioeconomic conflicts between highland and lowland producers, conflicts between rural and urban dwellers, as well as conflicts between rural producers and a central state's forces. Migration also causes conflicts within one and the same ethnic group that may be divided by geographical or national boundaries.

Empirical evidence partially supports the hypoth-

However passing the threshold of violence definitely depends on sociopolitical factors and not on the degree of environmental degradation as such.

esis that environmental scarcity simultaneously increases "economic deprivation" and "disrupts key social institutions." This is despite the fact that ENCOP refers to different theoretical concepts than ECACP. "Deprivation conflict," as one general type introduced by Homer-Dixon, has comparable connotations as the ENCOP types: center-periphery, ethnopolitical, internal migration, and global environmental conflicts. The concept of "disruption of key social institutions" is incorporated in the context of this study with the concepts of *marginalization* induced by discrimination against certain actors on one hand and by poor state performance in certain areas on the other.

Moreover, environmental conflicts in most cases involve rural populations in developing countries struggling for survival. Modernization and a high dependence on degrading resources challenge the livelihood security of rural dwellers. The probability that conflicts will escalate is high when

• a major contradiction exists between economic expectations and/or a larger demand for resources on one hand, and limited development perspectives, degraded resources, and poor state performance on the other (e.g., few off-farm alternatives, lack of technical skills, and financial means);

• at least one of the actors involved perceives the resort to violence as the best alternative to other solutions.

It is necessary to include many "if-then" clauses when examining violent outcomes of environmental conflicts. Environmental degradation may be a background reason for a certain conflict, it may be a factor leading to channeling or cleavages along lines between distinct groups, and it may even be a triggering factor to a conflict dynamic. However, passing the threshold of violence definitely depends on *sociopolitical* factors and not on the degree of environmental degradation as such. Critical sociopolitical factors include the lack of institutional capacities for peaceful conflict settlement, the readiness and/or capacity of authorities and leaders to organize and mobilize collective actors, the (mis-)perception of alternatives to resorting to violence, the preferences and opportunities of actors, and actor limitations. These topics have to be examined in more detail to better understand when and at what point environmental conflicts turn violent.

2. Inevitable Situations and the Lack of Regulatory Mechanisms (Hypothesis Two)

When considering the interests and the behavior of actors, action can be seen as the result of two consecutive filtering processes of decision-making. Concerning the first filter, how does transformation influence the opportunity sets of individual and collective actors? Related to the second filter, how does transformation shape actors' preferences so that violent conflict is considered the mechanism for solving environmental conflict?

In all forty ENCOP case studies, transformation of society-nature relationships was perceived as *serious* in terms of both degradation of renewables and discrimination against actors highly dependent on their shrinking natural capital. Yet only *eighteen* of these cases crossed the threshold of violence. In *eight* cases there were wars, whereas in *ten* cases, there were violent conflicts below the threshold of war. In *twenty-two* ENCOP cases—of which none serve as control cases—neither war nor violent conflict was present. In *eleven* of these cases, minor incidences of violent actions occurred that were below the threshold of violent conflict. *Nine* cases experienced either military threat or political tension only. And in *two* cases, the disputed projects were dropped or postponed.

Against this empirical background the conclusion is reached that the resort to violence only occurs if and when some of the following *five key situations* coincide:

Inevitable environmental conditions: Group survival is dependent on degraded resources for which no substitutes are apparent and eventually the group faces an inevitable and therefore desperate environmental situation. Inevitability does not stand for a deterministic or functional approach to human behavior. *Inevitable circumstances* are environmental conditions upon which an individual or a collective actor cannot rely upon rationally or deliberately.

Scarcity of regulatory mechanisms and poor state performance: When a political system is incapable of producing certain social and political conditions, goals, such as sustainable resource use, become unattainable. The scarcity of regulatory mechanisms is either due to a lack of state outputs regarding resource management and livelihood security or due to a disruption of (traditional) social institutions designed to regulate access to resources. Migration, for instance, can be a result of the first type of scarcity (state output) and thus provoke the second type of scarcity (disruption of institutions).

Institutionalizing the environment: The environment is instrumentalized or manipulated by dominating actors to pursue specific group interests so that environmen-

tal discrimination becomes an (ideological) issue of group identity. Instrumentalization can reach from the up-stream manipulation of the seasonal water flow for political reasons to the voluntary poisoning of water resources.

Opportunities to build organizations and find allies: Actors organize and arm themselves in political settings—often behind a strong leader—and gain allies either from groups affected by similar problems, from certain (fraternizing) factions of the elite, or from foreign groups such as I(N)GOs.

Spillover from a historic conflict: Environmental discrimination occurs within the context of an existing (historic) conflict structure and, as a result, the conflict receives new impetus. This push can come either from the perceived consequences of environmental transformation or from intensified resource competition between polarized actors.

These five contexts constitute the arena for actors who choose violence as their best alternative to non-violent activities.

2.1 Inevitable Situations

Rural dwellers experiencing environmental transformation depend more and more on fewer and fewer productive or available natural resources. Time horizons are very short as rapid resource extraction meets present needs—despite the resistance of third parties. If survival is at stake on a day-to-day basis, even minor incidents can force a decision about whether to stay and probably die or to flee. Violence may be viewed as a way to escape when no substitutes are available for degraded resources and/or the relationships between parties are stressed with no alternatives.

An inevitable situation has two sides: a lack of off-farm alternatives and poor state performance. High socioeconomic pressure on rural populations is paired with the powerlessness of policymakers to achieve desirable goals such as the wider distribution of more productive land, the creation of jobs, and the alleviation of poverty. The crisis of subsistence economies, therefore, is caused by both external and intrinsic factors. Both are closely intertwined. External factors are the commercialization of agriculture and related issues. The major intrinsic factor is the relatively low and even declining productivity of subsistence economies, due to poverty driven population dynamics in marginal ecozones.

Inevitable situations tend to lead actors in a certain area to hold mutually exclusive goals. This, in turn, provokes rigid polarization and—as a possible consequence—the resort to violence. Most environmental conflicts have to be seen as part of a new wave of re-

bellions where rural producers find themselves in inevitable situations. The area's groups encompass peasants, small holders, subsistence farmers, landless people, rural workers, life stock breeders and other rural groups. The opposite party in this conflict encompasses large-scale farmers, agro-business, *latifundistas*, rural entrepreneurs, international companies (*e.g.,* mining), urban dwellers, and certain political elites.

Inevitability is a *relational* rather than an absolute term. Many situations perceived as inevitable—such as "natural catastrophes" in a densely populated arena—are in fact avoidable social or *humanitarian catastrophes*. Inevitable situations are determined by major social stresses induced by an overwhelming density of conflictual interactions. Regulatory interventions to preserve productivity must occur faster and more intensely for almost exhausted land than for fertile land. Stresses can be caused by shorter fallow periods if at all; multifunctional land use: more frequent change of crops, more frequent movements of herds, and sharper competitions. Simultaneously a growing number of activities take much more time than before (hauling water, collecting fuelwood, finding pastures and water wells, cooking with solar energy, etc.).

2.2 Lack of Regulatory Mechanisms

Inevitable situations occur because of a lack of regulatory mechanisms, be they traditional conflict and resource management, modern law, or international regimes. If instruments for managing resources and regulating conflicts become ineffective over time, actors may come to view violence as a thoroughly rational means of pursuing their own interests. Instruments become blunt because traditional means are inadequate to new challenges of environmental discrimination. And new institutions based on modern law are not yet available to meet these challenges. In marginalized regions, the central state has not succeeded as an administrative and law-enforcing apparatus or as an institution founded on the rule of law, legitimized and accepted by the local actors.

With respect to environmental conflicts, the role of legal and civil institutions cannot be overemphasized. Civil society as a subsidiary conflict-regulating corrective is (largely) lacking in the countries analyzed although large differences exist between some medium developed and least developed countries. Nonetheless, political pluralism or the ability of opposition movements to make their claims is weakly developed in cases where violent conflicts and wars occur. The less stable and developed regulatory mechanisms are in a given society, the more susceptible the society will be to violence. The more established the rule of law and civil society, the lower the level of violence and the more meaningful the use of force. In participatory

societies, countless and sometimes serious environmental conflicts are resolved by legal and political means. Negotiation, compromise, and mediation play a central role. The organized use of force is not a central part of political strategy.

A state's authority to act consistently vis-à-vis environmental transformation should encompass a large array of economic, social, and institutional instruments: assess suitability and support crop choices, enhance the workability of land, provide access to markets, make credit and cash available, introduce land property rights, etc. Most of such instruments are hardly available in the ENCOP case studies where an *appropriate choice* would sometimes have made the difference between degradation and sustainability. Local and regional areas if not the state as a whole are subordinated to the interest of the center, often more concerned about adhering to international standards on commercial and investment law than on internal developments outside the capital district. Parts of the marginalized population see the state as a bureaucratic apparatus or as a hostile agent for foreign interests that plunders national resources without redistributing the revenues to provinces and communities.

The establishment of subsidiary conflict and resource management mechanisms would presume more than a mere economic distribution logic. Yet precisely the lack of conflict-resolving mechanism prevents innovative practice. In many places the ruling political culture allows little latitude to manage resources subsidiarily, the lowest level possible (except on marginal and degraded lands of minor value). As a consequence, there is widespread insecurity concerning property rights. Property rights disputes have rarely been solved satisfactorily, depriving a prerequisite for effective local self-government and sustainable resource management. Property rights enhance livelihood security and thus contribute to labor-intensive improvement of the productivity of sensitive soils.

States with poor performance are unwilling to adapt existing international regimes to new challenges (*e.g.,* Nile riparians). Nor are they committed to delegate substantial authority to supra-national regional organizations that aim at acquiring dispute settlement capacities (*e.g.,* International Governmental Authority on Development, (IGAD) in the Horn of Africa). Existing environmental agreements often express good will, but they show a considerable lack of binding legal power and strict implementation. The search for the least common denominator, weak enforcement mechanism, and "free riders" characterize regional agreements.

Weak states are not committed to assuming political responsibility for the ecological crisis. Governments instead tend to count on internationalizing responsibility for the crisis and waiting for foreign assistance. Due to the weakness of civil society on the other hand,

(re-) privatization of state power occurs through relatively small and inaccessible cliques usurping the state's monopoly on the use of force and changing its function into a spearhead against the population experiencing environmental discrimination. Only in relatively few cases is the disadvantaged group capable of responding with organized violence to the poor performance of their state and/or to the robbery of local natural capital by national elites.

2.3 Instrumentalizing the Environmental Problem

Due to the great importance of safe water supply for vulnerable states, international river basins are easily instrumentalized as political means of pressure or blackmail. As discussed earlier, a strong upper-riparian state can carry through geopolitical interests against its lower-riparian neighbor. For its part, the lower riparian clearly has fewer means of pressure available. However, it can seize the water issue in order to denounce the upper-riparian state's unethical behavior. This strategy helps to create international awareness and to mitigate the asymmetry between the actors.

In cases where heavy environmental damage is caused by third parties (*e.g.,* mining companies), the protection of nature proves to be good mobilizing factor for local groups. This strategy also can be beneficial because environmental consciousness is rewarded on a global level (by the UN, INGOs, etc.). Using the ecological vocabulary, although previously concerned little with nature protection, is often the only way for marginalized groups to get attention concerning their generally worsening living conditions (*e.g.,* Ken Saro-Wiwa and the Ogoni in the Delta State of Nigeria).

Opposition groups tend to instrumentalize ecological crises in their criticism of the state. Organized actors in opposition sometimes use segments of groups facing environmental discrimination for ulterior political motives. Remnants of communist guerrillas, now faced with recruiting problems, side with the demands of protesting farmers against deforestation and export business. And due to the penetration of agents for outside interests, indigenous peoples with close and mythical nature relationships see a political advantage in making environmental disruption central in their criticism of the modernizing state. Thus, while feeling uncomfortable with the infiltration of the modern world, they emphasize the cultural and spiritual dimensions of deep human-ecological relationships. The destruction of sacred "mother earth" by foreigners is rejected as extremely immoral and as a threat to humanity.

2.4 Opportunities to Build Organizations and Find Allies

Instrumentalizing or manipulating environmental transformation is not presumptively explosive. A mili-

tary conflict only emerges if specific fault lines accentuate it, if polarizing actions drive it forward and if groups are organized and mobilized. In order to do so leadership and arms are required.

It is noteworthy that the threshold of organized use of force in environmental conflicts is relatively high in comparison to the large amount of environmental discrimination occurring throughout the world. Given the level of environmental discrimination with at least 500 million of the poorest people living in ecologically sensitive zones (about 400 million in rural and about 100 million in urban zones), how can one explain the fact that force has been used in so few case to address these grievances? There is certainly no linearity between environmental discrimination and the use of violence. Many inhibiting factors are involved. The same cause had, as a matter of fact, different effects: individuals prove to be unwilling or unable to join a group with strategic goals; various communities and identity groups have virtually no capacity to go to war. Different reasons account for these outcomes: marginalization, lack of means and organizational skill, lack of leadership, state repression, poor health condition, wide-ranging apathy, fatalism, defeatism, and religious mystification at one's own situation.

Only groups that actually organize and arm themselves seize the means for collective resistance against other parties in the arena. The ability and opportunity to ally and build coalitions with other actors constitute important prerequisites for organized violence. The mainly rural actors capable of waging conflict need powerful coalition partners from different social levels to support their goal (for instance, part of the *intelligentsia*, members of the middle class, or a charismatic leader of an ethnic minority at risk). Many scholars of peasant revolts have come to the same conclusions as Barrington Moore, namely that "(p)oor peasants and landless laborers … are unlikely to pursue the course of rebellion, unless they are able to rely on some external power to challenge the power which constrains them" (Wolf 1969: 290).

It is the weaponry that makes a difference. Through proliferation of cheap weapons, especially widely available small arms, individual conflicts—*e.g.*, between farmers and nomads—assume a more dramatic turn of events than was probably intended by parties to the dispute. Quite often, parties that historically have fought each other with traditional weapons, underestimate the lethality of modern arms. The capacity to carry out an armed conflict is especially reinforced where marauding armed gangs, militant youth groups, and demobilized soldiers or mercenaries are entrusted with the supply of weapons and/or take part in military actions.

Yet coalition possibilities are not always available to groups attempting to redress environmental discrimination. With few exceptions, communist guerril-las with greater fighting experience have dropped out as potential alliance partners (*e.g.*, Malaysia, the Philippines). The UN has recently demobilized the last armies to fight against the colonial powers (*e.g.*, Mozambique). As a result, it has become more difficult than in the 1970s and 1980s for rural populations under discrimination to find combat-ready allies.

Furthermore, national and international environmental organizations (I(N)GOs) are committed as a rule to nonviolent forms of resistance. Their solidarity and expertise are aimed at environmental concerns and they are prepared to oppose government positions (*e.g.*, IUCN concerning the Okavango basin in Botswana). But these groups do not resort to using armed force. In the international context of the United Nations, increasing value is placed on peaceful resolution of disputes within nations. Groups prepared to use force therefore cannot count on support as they could for colonial and post-colonial liberation movements.

2.5 Context of an Ongoing Armed Conflict

The remarks on the limits of using force apply if environmental conflicts are not drawn into the maelstrom of historical armed conflicts or even provoke them anew. Environmental problems such as the scarcity of river water can have massive consequences within the framework of a comprehensive historical conflict, (*e.g.*, water issues in the Middle East).

A more frequent phenomenon can be seen in the twofold interaction between environmental destruction and war. Many domestic and international Third World wars carried out within the context of the Cold War have had devastating impact upon renewable resources. Deforestation, destruction of vegetation, and expulsion or killing of farmers and livestock caused massive degradation in regions such as the Horn of Africa where highland areas were already threatened by heavy erosion. In the aftermath of protracted civil wars, rural development is more risky than before the war. The environmental destruction—previously a result of protracted conflict—may itself become a contributing or triggering factor of a future confrontation.

3. THE ROLE OF THE ENVIRONMENT AS A CAUSE OF CONFLICT

Which role does environment play if and when it causes a violent conflict? Is it a deep-rooted reason for violent conflict? Does it shape group identity? Or is it an intervening variable contributing to the escalation of violence?

As most of the area studies show, transformation of society-nature relationship does play and interesting role in causing violence. In the cases under consideration, environmental degradation is supposed to be an exogenous or necessary factor to the conflict; this

means the conflict would not have occurred in the same way—or even at all—without environmental degradation being an important variable.[6] The evaluation also indicates that the role of environmental discrimination—depending on the individual case—can be quite different. Its role ranges from discrimination being a background reason to the point where it is a proximate trigger to a violent conflict. In the causal analysis, therefore, it is critical to clearly distinguish among the various impacts environmental degradation has on the conflict behavior of actors.

3.1. Reason

First, transformation of society-nature relationships plays a role as a *reason* for conflict. It is perceived as almost predestined and, from the viewpoint of the groups affected, hardly within their power to ward off. This is the great background role of the environment being the permanent "noise" in the system. Transformation of landscapes in a historical dimension and its effects "act" as either hidden or clearly visible "system powers" by touching on the opportunities and preferences of affected actors in many ways.

Due to complex interactions, it is often hard to distinguish between the role of transformation of the landscape and the role of economic decline. However, there is an important difference between *economic* scarcity and *environmental* scarcity which has always been neglected in classic economics. Economic scarcity addresses the distribution problem of man-made goods between those interested in access to these goods. Environmental scarcity, on the other hand, highlights the input side of a third (external) factor, namely of natural resources provided by the landscape as a life support system (land, water, mineral, coal, oil, gas). Economic conflicts are political conflicts that deal with the production and (re-) allocation of human and physical capital, whereas environmental conflicts are political conflicts that are concerned with the availability of natural capital. The later is a necessary prerequisite to any economic activity. The subjects of environmental conflicts are degraded sources and over-strained sinks. For example, eroded and marginal land trigger conflicts over access to productive land. Polluted water resources trigger conflict over access to rich fishery resources. Hence, the reason or the *casus belli* are the increasing availability of "common bads" and the discriminated access to scarce "common goods."

3.2. Trigger

Second, transformation of the landscape plays a role as a *trigger* if actors perceive discrimination as inevitable. A trigger causes an actor who previously preferred non-violence to prefer violent action. Sudden events such as crop failures trigger migration and flight that lead to violence. Violent action cannot be excluded as a possible outcome if livelihood security is at stake and organized actors face environmental discrimination (*e.g.,* ethnopolitcal conflicts).

The transformation of the landscape triggers violence if it is obviously caused by projects of third parties (*e.g.,* mining company/central government on Bougainville and Dutch Shell/central government in Ogoni land in Nigeria). Generally speaking, transformation triggers violence if discrimination against actors is immediately linked with specific events leading to the destabilization, if not dissolution, of the social order. The latter may be caused by the use of marginal land or by specific project-related activities which create "national sacrifice areas." Therefore, conflict analysis has to focus on how political institutions operate, on how socioeconomic structures fall apart, and how traditional ways of living are at stake.

3.3. Target

Third, environmental concerns become a *target* of discriminated actors if transformation of the landscape is what the conflict is about—at least in the eyes of one of the actors. In many conflicts, sustainable resource use may be an ultimate goal of actors highly dependent on their natural capital. However, protecting one's resources against the intervention of third parties often stands in the foreground.

A target usually encompasses different sub-goals not always internally consistent. Resisting foreign intrusion into one's own environment also presents a dilemma to discriminated actors. On one hand, resistance pivots around the natural and cultural environment to safeguard against invasion of modernity; on the other hand, it turns back the threat of marginalization by participating in modernization and development. Thus, environmental concerns—first having been a target in and of itself—become a reason for pursuing new goals. As we have seen in some cases, the struggle for self-determination, autonomy, and secession becomes the main target putting the environmental concerns on a sidetrack. Central governments tend to react to the call for self-determination by upholding national sovereignty and territorial integrity, and, if necessary, by use of military force. Since discriminated actors perceive the use of military force further proof of centralization and delegitimization, the goal of self-determination is justified once more.

3.4. Channel

Fourth, environmental concerns only indirectly serve as a *channel*. A channel is a line of political, social, economic, or national cleavage. Channels thus are designed to shape the group identity by manipulating existing sociopolitical fault lines.

Even though a high level of environmental degradation in a certain area shapes threat perceptions, channeling moves the environment to the background as ongoing conflicts proceed. Once a conflict escalates to war, it will hardly be waged primarily over the original reason or the trigger of the conflict itself. In the hot conflict phase, hostile parties tend to grasp for fundamental legitimization patterns and ultimate goals. Slogans such as "to be or not to be" or "they" destroy "our" resources, are mobilizing channels more than "land scarcity" as such.

Nonetheless, at the same time group leaders fighting for autonomy or secession may promise a solution to environmental problems. If self-determination will be achieved—so the assumption goes—"we" will not act as irresponsibly as "they" did. War therefore is not waged directly to solve ecological problems even though they may be a reason or a trigger. Similarly, war does not occur in order to defend the traditional way of life against the "attacks" of modernization. War is often about self-determination and national sovereignty. Once this goal is achieved, then self-determination is supposed to contribute almost automatically to the realization of previously formulated ecological goals. This, however, almost always turns out to be a miscalculation.

In politicized identity conflicts and center-periphery disputes, environmental damage is used as a means to realize larger goals. Marginalized groups may conclude that they can only find coalition partners and international recognition if the environmental damage caused by them can be used for solidarity to realize a further goal (*e.g.,* independence from a corrupt or nepotistic central government). Indeed this mobilizing strategy forms the basis of clearly perceptible and perhaps even dramatic environmental destruction. However, the environmental problem is overemphasized or taken selectively as factor from the large context and reinforces the attempts to shape identity (*e.g.,* Ogoni in Nigeria or the Bougainvillean Revolutionary Army against the central government).

3.5 Catalyst

Fifth, in only a few cases, the transformation of landscape becomes a *catalyst* of conflict. However, sudden events, such as floods or cyclones may unexpectedly contribute to the further deterioration of renewables exacerbating food supply resources and therefore intensify on-going resource conflicts. The damming of water leading to acute down-stream scarcity or the severe pollution of fresh water resources also suddenly enhance tension between conflicting parties. Intentional actions carried out to deny access to resources leads to the environment being a catalyst. Moreover, if environment is designed to be a catalyst it may also be a valid instrument for channeling (*e.g.,*

Delta Region in Nigeria).

4. The Intensity of Environmental Conflicts

Actors alone shoulder responsibility for triggering and supplying the motivation for violent conflict. A distinction must be made between the structural cause of a conflict and conflict dynamics or intensity. While environmental discrimination plays different roles in the causation of a conflict, its intensity does not depend on the degree of the physical and chemical degradation of the landscape. As pointed out earlier, no linear correlation exists between the quality or quantity of natural resources and the intensity of violence; many accelerating and inhibiting factors are present.

In disputes between the *center and periphery*, all-out wars are rather unlikely. This generalization applies especially for mining and dams. In such settings, escalation to war occurs only in exceptional cases (*e.g.,* Bougainville and Chico). Violence is prevalent at relatively low levels with only a few fatalities. Center-periphery conflicts engender almost everyday endemic and diffuse violence by groups facing discrimination. But these groups hardly display organization toward developing "war parties" with clearly defined strategic goals. Conflicts often escalate in a spiral of violence if acts of sabotage prompt government troops to take punitive actions directed arbitrarily against communities and settlements. If escalation to violent conflict actually occurs in connection with large projects and accompanying ecological degradation, most of them remain below the war threshold. The conflict is often contained within the especially sensitive arena, such as a national sacrifice area, by the militarily superior center.

The greatest conflict potential lies in *ethno-politicized* conflict settings and in *inter-regional* or *demographically driven migration conflicts* in countries with poor state performance. The actors are as numerous as they are diverse: minorities versus majorities, tribes versus tribes, clans versus clans, native people versus immigrants, settlers versus nomads, nomads versus governments, subsistence farmers versus multinational concerns and central governments, unemployed versus the financially better-off, and rural classes versus the central government and nomenclatures. The diversity of the actors shows that two well-equipped armies with heavy weapons seldom face off against each other. Often, more or less motivated government troops see themselves confronted by lightly armed groups. Despite these trends, the danger of arming the marginalized groups should not be underestimated. Struggles for resources have historically been relatively confined and partially ritualized between various indigenous groups. But modern weaponry often brings about a more lethal level of dispute between opposing troops.

In individual ethnopolitical wars of medium and high intensity, resource degradation, competing land-use rights and tenure systems, population growth, ethno-social stratification, regionalism, and maldevelopment accumulate into an insoluble problem syndrome causing and/or triggering violent responses. A high intensity of violence with all its excesses ensues, touched off by war crimes, rape, massacres, and crimes against humanity including genocide (*e.g.,* Rwanda, Sudan).

In the foreseeable future, environmental conflict will not be a "world war" with a global front. A war between the United States and China to preserve the ozone layer, for example, would be absurd. Even classical inter-state wars—for instance between riparians of the same river basin—may remain an exceptional phenomenon due to intensified efforts concerning international agreements. However, in some cases, certain threat potential warrants careful monitoring (Middle East, Central Asia, Nile basin, and Mekong basin).

The growing problems of supplying agriculture, industry, and households with fresh water will become domestic problems. They will either be linked to conflicts due to the marginalization of rural poor or the creation of national sacrifice areas. Either way they are two sides of the same coin, namely environmental discrimination. Conflicts in marginalized ecoregions as well as in national sacrifice areas are by definition related to some clusters within states. Thus they fail to induce an overall conflict pattern affecting countries as a whole. More often central governments try hard to contain violence as much as possible within the area at stake. These attempts, if successful, lead to protracted low-intensity conflicts in focal areas. As a result, heterogeneity increases between highly productive rural farming arenas and efficient urban centers on one hand, and ecologically sensitive rural areas with low human development on the other. The front line between the two sectors becomes the more or less clear-cut fault line of ongoing conflicts. The same key factors lead to both further transformation of society-nature relationships as well as to violent conflicts: environmental discrimination, overuse of renewable resources by actors highly dependent on natural capital, unclear and competitive tenure systems and property rights, and political mobilization against poor state performance in marginal arenas.

4.5 Outlook

The analysis of causal links between environmental transformation and violence should help identify routes to early recognition of transformation conflicts and to successful conflict management once prevention has failed. It is obvious that conflict management dealing with the conflict dynamics alone cannot lead to success. It gets stuck in a fight against symptoms if it does not adequately address resource management and thus structural pressure on the biophysical environment.

The concept of sustainability cannot blind us to the fact that there are economic and ecological reasons for the failure of modernization and industrialization strategies in developing and transitional societies. Sustainability suggests a unified horizon of development for all. Yet such development is an illusion when environmental discrimination is the dominant mechanism to regulate resource access. Sustainable development—regardless of how it is defined—makes no sense if central issues about development per se are left open. Such developments inevitably lead away from what would be sustainable living. How must institutions be designed to limit environmental conflicts in strongly heterogeneous and multiethnic societies? How can the necessary latitude for sustainable resource use be provided considering the conditions of the poor? Does sustainability freeze in place the existing gaps between development and maldevelopment? Where does the Brundtlandian contract between the generations lead if already unproductive small plots have to be further sub-divided to sizes not manageable within the next one or two generations? Where do next generations go if they find neither sustainable conditions in rural areas nor off-farm opportunities in other sectors? And finally, how can sustainable development be established under conditions of violent conflict and war in about half of all developing countries?

Questions offer direction for further thinking. In many areas, similar conflicts occur simultaneously with comparable causes, actors, and goals. The basic question therefore becomes, do these individual environmental conflicts foreshadow a larger socio-political disintegration process especially relevant for developing and transitional societies? If this is going to happen, there are two possible interpretations for the disintegration phenomenon and the further course it will take. Environmental conflicts are the tip of the iceberg—retreat skirmishes of an increasingly marginalized majority of rural dwellers inevitably maneuvered into a no-win situation. This would be the worst case. Or, in the best case, these conflicts are the harbingers of conflict formations that—in the long term—lead to the strengthening of rural populations. A prerequisite for this alternative would be the reduction of rural population through migration and concentration in provincial centers. The remaining parts might then be able to establish sustainable rural structures serving the local and regional centers.

In any case, there is ample evidence that future environmental conflicts and their intensification and geographical expansion can only be avoided, or at least mitigated, if an when peaceful problem-solving and resource management are successfully implemented.

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ENDNOTES

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[1] Most of the empirical studies referenced in this article are found in Baechler *et al.* (1996) as well as in Baechler/Spillmann (1996 II, III). Some others exist as draft papers only.

[2] "Environmental conflict" connotes environmentally caused violent conflict and wars. Concerning the definition of war, refer to the concept provided by Istvan Kende and further developed by Klaus-Jürgen Gantzel. War is an armed, violent mass conflict following a planned strategy, encompassing the following three constitutive qualitative criteria: 1) it must be a conflict with a minimum of continuity (months rather than days); 2) there have to be central organizations on both sides (this could also be a para-military or guerilla force); and 3) at least one of the war parties has to be a government with regular or at least government associated troops (Kende 1982:5; Gantzel 1987:33). Violent conflicts are organized armed struggles of some duration (more than a one-day upheaval) between two or more collective actors with political goals. Violent conflicts are below the threshold of war but have a strong tendency towards this escalating to war.

[3] The individual authors of the case studies are not listed separately in the bibliography attached to this study. All authors with either (1996II) or (1996III) indicated in sections 1.1 to 1.7 are included in Baechler/Spillmann (1996II, III).

[4] Poor state performance is a lack of state outputs regarding civil and political rights, welfare expenditure, livelihood security, resource management, income, and job creation. The state may not produce good outputs for two different reasons. Firstly, the decisions and actions of the state are correct in terms of publicly stated legitimate goals, but their impact is not strong enough to reach the goals. Secondly, the rulers, although proclaiming that the state enhances the public interest, may pursue ends that are actually in their own interest. Both reasons apply especially for regions outside the capital area. Adopted and modified from Lane/Ersson (1994: 82-83).

[5] ENCOP conducted a case study dealing with the globalized conflict in French Polynesia concerning the nuclear tests carried out by the French government. The study addressed the environmental disruption through testing as well as the protests of indigenous population, liberation movement, and INGOs against the policy of the French and the intervention of the navy (Danielson 1993(manus.)).

[6] From a social science perspective, cases are interesting only where environmental scarcity is a necessary factor. With the configurative case studies approach the distinction between contributing and necessary factors depends highly on subjective judgements. Therefore, biases were diminished through periodical discussions among the researchers that contributed different case studies to ENCOP. On the other hand, the development of a testable model will be necessary if one aims to falsify empirically the distinction between contributing and necessary variables.

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