

NEW UNEP REPORT PROVIDES AN OVERVIEW OF ENVIRONMENTAL CONDITIONS, RESOURCES, AND CONFLICT

Nairobi, June 1999 - A new report, "Environmental Conditions, Resources, and Conflicts: An Introductory Overview and Data Collection", has been published by the United Nations

Environment Programme (UNEP). The report highlights the proposition that a growing trend in international and intranational conflict appears to be linked to deteriorating environmental conditions and resources. The report provides a concise overview of the elements of environment-related conflict as a basis for a better understanding of an increasingly complex field. An understanding of the principles presented in the report should facilitate efforts of conflict resolution and prevention.

A review of the scientific literature indicates three major trends:

1. Conflicts over water resources appear to be a major source of direct international conflict. The most common environmental elements around which conflicts can erupt are water flow, diversion, salinization, floods and pollution.

2. Indirect international or indirect intranational conflict are commonly caused by resource depletion issues - deforestation, soil erosion, desertification, flooding and pollution.

3. From the empirical evidence across all categories, it appears that the vast majority of environmentally related conflicts occur in developing regions.

These trends point to different avenues for conflict resolution and prevention. The first two trends for example, suggest that priority attention to sound management of environmental and natural resource usage factors could prevent conflict. The transboundary nature of many of these issues places emphasis for the mitigation of environmental degradation on international institutions. Stewardship of these environmental factors requires the commitment and effort of governmental and non-governmental bodies and communities at national and local levels.

The third trend suggests that the level of technical ingenuity and capacity to overcome deteriorating environmental conditions could be an important factor in addressing environmental conditions in the developing world and reduce pressures leading to conflict. The level of "technical ingenuity" in a society refers to its capacity to systematically marshal scientific and social solutions to societal quandaries. Efforts at conflict resolution and prevention, therefore, should not only be directed at improving environmental conditions but should also aim to heighten the level of technical ingenuity and capacity to mitigate environmental degradation.

The report makes it clear that the maintenance of good environmental conditions and resources may hold one of the keys to future peace. As Dr. Klaus Toepfer, Executive Director of UNEP concludes in the Foreword to the report, "This report in no way judges individual countries or political groups, nor does it attempt

to give direction and advice on how to solve these conflicts. However, almost seven years after the Rio Conference, and in the light of the Special Session of the General Assembly of June 1997, it is clear that the opportunity for the humankind to combat international and intranational conflict must be seen in the light of the connection between environmental conditions and resources".

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Environmental Conditions, Resources, and Conflicts

An Introductory Overview and Data Collection

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Foreword

Historically, environmental resources have often been an indicator of the wealth of those being in a position to utilize them. Thus, for centuries, access to non-renewable resources was directly linked to development, and conflicts occurred while powers were defending or trying to gain access to these resources. During the second half of the 20th century, socio-economic developments shifted the political and scientific discussions on conflicts and environmental resources. Discourse in this area turned to the question of whether, and how, depletion and unsustainable uses of natural resources (renewable as well as non-renewable), and the demographic development of human populations, triggers international and intranational conflict.

This publication attempts to give a brief overview of the most recent discussions surrounding environmental conditions and resources, and the linkages to conflict. By compiling examples and grouping these according to specific characteristics, this report attempts to provide a basis for the establishment of a global data collection on environmental conflicts. By indicating patterns of social and environmental interaction, a continuously updated data collection on environmental conflicts could enhance efforts of conflict resolution and prevention by the international community.

This report in no way judges individual countries or political groups, nor does it attempt to give direction and advice on how to solve these conflicts. However, almost seven years after the Rio Conference, and in light of the Special Session of the General Assembly of June 1997, it is clear that the opportunity for humankind to combat international

and intranational conflict must be seen in light of the connections between environmental conditions and resources, and conflict. It is the intention of this report to assist in deepening our understanding of these linkages.

Klaus Toepfer
Executive Director
United Nations Environment Programme

Introduction

The political and strategic impact of surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, and possibly, rising sea levels — developments that will prompt mass migration and, in turn, incite group conflicts — will be the core foreign-policy challenge [in the twenty-first century].

— Robert Kaplan, *The Coming Anarchy*

Robert Kaplan's 1994 *Atlantic Monthly* article, "The Coming Anarchy," popularized the idea that mounting population and environmental pressures can contribute directly or indirectly to conflict.¹ Although Kaplan's graphic depiction of a world beset by swelling population numbers, severely degraded environmental resources, and escalating violence, may have shocked the public, his ideas (if somewhat exaggerated) are not new to the international security community. Nearly two decades ago, the prospect of environmentally-induced conflict was identified, and subsequently the idea of "environment and conflict" has been hotly debated in academia and international policy circles.

The Overview section which follows attempts to summarize the field of enquiry referred to as "environment and conflict."² It begins by placing the field of "environment and conflict" in perspective relative to the larger field of "environmental security". The analytical positions on "environment and conflict" are then characterized and categorized according to the following foci:

- Renewable vs. non-renewable resources
- "Direct" vs. "indirect" conflict
- International vs. intranational conflict

This categorization, which is explained in full below, is an attempt to provide a framework for the data collection and selected case studies which follow the Overview. The intent of organizing the

theoretical and empirical material in this fashion is to provide policy-makers and researchers with a means of systematically analyzing environmental conflicts, which in turn should allow them to better apply techniques of conflict resolution and prevention to such conflicts.

Overview

The environment-conflict nexus is a subset of “environmental security” — a field of inquiry that seeks to determine whether or not traditional notions of security (which emphasize countering military threats with military power) should be adapted to include threats posed by population growth and diminishing quantity and quality of environmental goods and services.

This query was launched in 1977 by Lester Brown of the Worldwatch Institute, in an article entitled “Redefining Security.”³ Brown based his argument for a redefinition of security on what he and his colleagues perceived to be the pre-eminent threat to future human welfare — the increasingly widening gap between the supply and demand of environmental resources. Brown’s hypothesis, in turn, derives from an historical debate that pits “pessimists” (neo-Malthusians who believe that unchecked population growth will inexorably outstrip the supply of resources) against “optimists” (neo-classical economists who believe that market forces working in conjunction with human ingenuity will produce technological solutions to mitigate the threats posed by population growth).⁴

A plethora of academic, governmental, and non-governmental writings on environmental security have emerged since the issue was sparked by Brown in 1977. Work on this topic has grown progressively complex and now incorporates a multitude of institutions, actors, and conceptual frameworks.⁵ These concepts can be broadly grouped into three basic focus areas:

- The redefinition of traditional notions of security.
- The relationship between traditional security institutions and environmental concerns.
- The relationship between environment and conflict.

As noted in the introduction, the emphasis of this report is on the third conceptual focus area, the relationship between environment and conflict. Nevertheless, it might be helpful to briefly portray all three areas in order to attain an enhanced perspective on the debate surrounding the link between environment and conflict.

FOCUS AREA ONE: THE REDEFINITION OF SECURITY

Proponents of the redefinition of security claim that by focussing solely on the military dimensions of security, one risks bypassing non-military threats to security such as economic decline and deteriorating human health conditions — both induced, in part, by demographic and environmental pressures such as population growth, pollution, and resource scarcity. Proponents stress that in an increasingly socially and economically interdependent post-Cold War world, it is misguided to consider military threats as the consummate security concern. Economic as well as environmental policies, not to mention overlapping ethnic and cultural conflicts, need to be addressed via the redefinition of security.⁶

Opponents of redefining security argue that by including non-military threats, the definition of security becomes so broad that it loses all practical utility. They therefore support the continuation of a strict demarcation between what they consider “low” (economic and environmental) and “high” (military) politics.⁷

**FOCUS AREA TWO:
THE RELATIONSHIP BETWEEN
TRADITIONAL SECURITY INSTITUTIONS
AND ENVIRONMENTAL CONCERNS** ⁸

The dominant debate in this field of inquiry centers around the potential utility of military and defense intelligence institutions in mitigating environmental concerns. Proponents argue that such institutions are well trained and adapted for such missions.⁹ Opponents maintain that environmental problems require co-operative responses whereas defense institutions are primarily of a conflictual nature, and therefore ill-suited for addressing environmental quandaries.¹⁰ Other critics add that because defense institutions contribute significantly to environmental degradation, it is counter-intuitive and counter-productive to assign these institutions to the duty of mitigating environmental problems.¹¹

**FOCUS AREA THREE:
THE RELATIONSHIP BETWEEN
ENVIRONMENT AND CONFLICT**

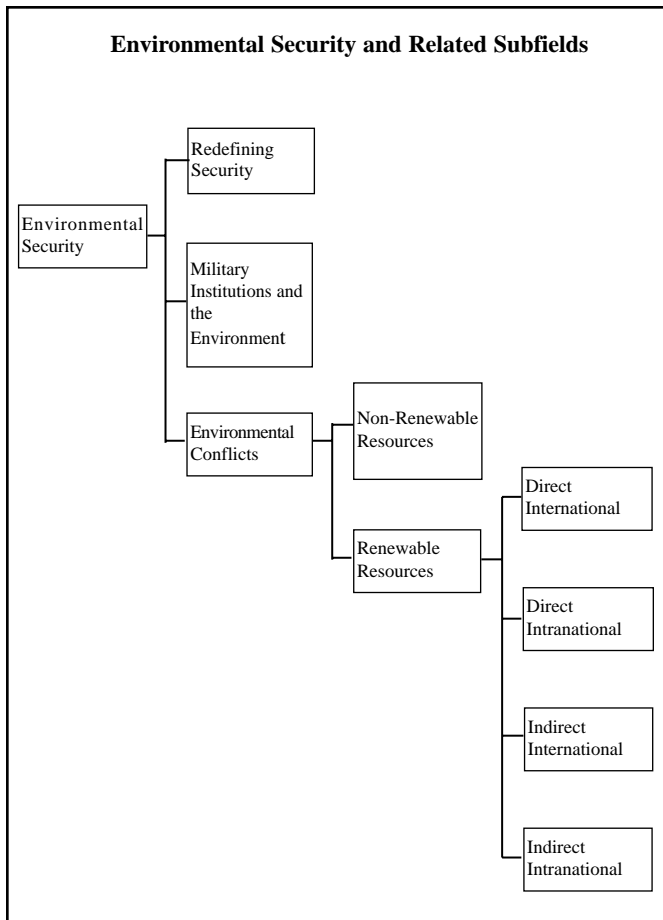
The notion that disputes and violence can erupt over access to resources appears commonplace: international wars have been fought over access to land and water since biblical times. Indeed, the link between environmental resources and the outbreak of international conflict has been recognized for decades. What separates modern-day analysis on environmental conflicts, however, is a recognition of: (1) the role that population growth plays in fomenting conflicts; and (2) the distinction between non-renewable and renewable resources.

Post-1970 works on “environment and conflict” emphasize the role that population growth plays in engendering resource scarcity.¹² This “demand-induced scarcity” might either force nations to look beyond their borders for resources and hence propel state expansion, or create apprehension amongst the population(s) within a nation whom are most affected by this scarcity and create conditions ripe for internal violence.

The distinction between non-renewable and renewable resources is likely one of the more important factors distinguishing past works on resource wars from modern-day analysis on “environment and conflict.” In the past, most analysis on the link between resource scarcity and international war focussed on non-renewable resources such as oil and minerals. Today, most experts do not contest the influence that non-renewable resource scarcity has had on the outbreak on international conflict.¹³ Instead, the focus has shifted to renewable resources such as cropland, fish, forests, air and water.¹⁴ The various foci of those analyzing the links between renewable resource scarcity and conflict, however, requires differentiation.

Renewable Resource Scarcity and Conflict

There are two important distinctions to be made while analyzing the renewable resource scarcity - conflict relationship: (1) direct vs. indirect conflict; (2) international vs. intranational conflict (see Figure, this page). These distinctions are necessary in order to be able to group and analyze the various aspects of environment and conflict.



“Direct conflict” refers to conflict over renewable resources that arises because of direct competition between two or more parties for the control and/or access to these resources. “Indirect conflict” refers to conflict that arises when renewable resource scarcity interacts with one or more social/economic factors to elevate friction within or between states. When “indirect conflict” occurs, environmental factors are only one factor exacerbating and/or interacting with other social phenomena such as poverty and ethnic tensions. International conflict refers to conflict between two or more nations. Intranational conflict refers to conflict within national boundaries.

Given these two distinctions, studies on the link between renewable resource scarcity and conflict can broadly be categorized under four distinct headings:

- Direct international conflict
- Direct intranational conflict
- Indirect international conflict
- Indirect intranational conflict

Although the boundaries may sometimes be blurred, this typology can serve as a guide to the available scientific literature, and as a framework for organizing empirical evidence.

Direct International Conflict

Proponents of this type of conflict claim that an increasing demand for natural resources fuelled by population expansion, in combination with a dwindling supply of natural resources brought on by ecological degradation, will inevitably augment international competition over existing supplies of natural resources. This increased competition could give way to escalating tensions, and may eventually foment international episodes.

While renewable resources such as croplands, fish, and forests have been identified as resources that might produce international competition, it is water — in particular river water — that has garnered the most attention from researchers. Proponents contend that water, like oil or other monetarily lucrative and non-renewable resources, can potentially constitute a significant source of economic and military strength for a nation. When water demand outstrips available supply, a nation is able to justify military action (whether offensive

or defensive) in the name of economic preservation and national security.¹⁵

Direct Intranational Conflict

There is little theoretical literature pointing to the possibility of direct conflict over access to resources within national boundaries. This is not surprising given that countries usually contain legal/institutionalized mechanisms for resolving direct conflicts that occur within national boundaries, whereas the international system is characterized by relatively impotent legal/institutionalized mechanisms for resolving nation-nation conflicts.

One recent example of “direct intranational conflict”, however, is the violence that has erupted in India over irrigation rights to the Cauvery River.¹⁶ This dispute demonstrates that the dearth of theoretical literature in this area does not rule out the general possibility that more direct intranational conflicts will not occur.

Indirect International Conflict

A number of analysts have recently predicted that, rather than emanating from direct competition over access to resources, international conflict will likely arise when renewable resource scarcity interacts with other economic and social factors to inflame tensions between nations. These analyses predict a trend, whereby wholesale clear-cutting of virgin forests, over-fishing, soil erosion, contamination of water and agricultural resources, climate change, and countless other forms of ecological and environmental degradation, lead to mass migrations, deteriorating human health conditions, and chronic poverty. These dire social effects, in turn, interact with smoldering hostilities between nations; the outcome is escalating grievances between nations which ultimately find their outlet in armed conflict.¹⁷

The majority of analyses on “indirect international conflict” have tended to focus on the consequences of large scale environmental changes such as global warming and ozone depletion. For these analysts, large-scale environmental changes will generate a series of disturbing environmental conditions, which in turn will aggravate existing social conditions and create circumstances ripe for international conflict. Global warming, for example, has the potential for reducing agricultural output and raising sea-levels, two conditions that could exac-

erbate poverty and human suffering, foment mass migrations, and eventually lead to international conflict.¹⁸

Indirect Intranational Conflict

The focus of much research on environmental conflicts pertains to intranational conflicts that arise when environmental scarcity interacts with other social circumstances to create conditions ripe for violence. Similar to “indirect international conflict”, “indirect intranational conflict” occurs when environmental factors such as soil erosion, agricultural contamination, and water pollution, exacerbate and interact with other societal problems such as poverty, ethnic cleavages, mass migrations, and an uneven distribution of political and economic resources. Researchers have also demonstrated the link between the spread of micro-organisms and infectious disease (emanating from deteriorating environmental conditions), and the physical and socio-economic health of populations.¹⁹ The result of these volatile combinations is often intranational violence which could take the form of revolutionary insurrections, ethnic violence, urban crime, or state-sponsored civilian repression.²⁰

data collection is followed by a series of brief synopses on selected case studies of indirect international and intranational conflicts. Finally, in the General Conclusions, a summary and brief analysis of the material contained in this report will be offered.

CONCLUSIONS TO OVERVIEW

The field of “environment and conflict” is a sub-field of “environmental security.” Recent works on environmental conflicts have shifted focus from non-renewable resources to renewable resources. Work on renewable resource conflicts can broadly be categorized under: (1) “direct” or “indirect” conflict; (2) international or intranational conflict.

Based on this categorization, a typology was developed in this Overview with the purpose of achieving two goals: (1) to help researchers and policy-makers better situate themselves in the vast literature in the field of “environment and conflict”, and more generally, “environmental security”; and (2) to establish the framework for a data collection on environmental conflicts which, in turn, will help researchers and policy-makers identify patterns in the linkages between environmental resources and conflict, thereby facilitating conflict resolution and prevention.

The following section will offer a data collection of direct international conflict as well as indirect international and intranational conflict. The

Data Collection and Selected Case Studies

The data collection below, although not exhaustive, lists environmental conflicts according to the typology laid out in the Overview.

The case studies which follow the data collection are summaries of larger works written by various researchers and experts in the field of "environment and conflict." Not all of the environmental conflicts listed in the data collection are covered in the case studies. The selected case studies shall serve as examples and illustrate the theoretical framework discussed in the Overview. Facts and arguments are those of the specific authors and are in no way meant to convey the opinions of either the authors of this report or the United Nations Environment Programme.

Occasionally, secondary sources are used to complement the information provided. All secondary sources have been duly endnoted. The studies will be grouped according to the aforemade typology.

The diagrams and summaries are not meant to convey the complexities of the case study as dealt with by the various authors. For a detailed account of each case study refer to the original work in question.

Further, the focus of these case studies is on the manner in which environmental pressures play a causal role in conflict. In most cases there is more than one causal variable generating episodes. The focus in these case studies, however, is on one causal connection in particular: the environment as a catalyst in the spawning of conflict.

How each case study is set up:

Summary. A brief overview of the case study is provided.

Environmental Factors. The key environmental factors that have contributed to the generation of conflict are explained in brief. Population growth is considered here to be a demographic fac-

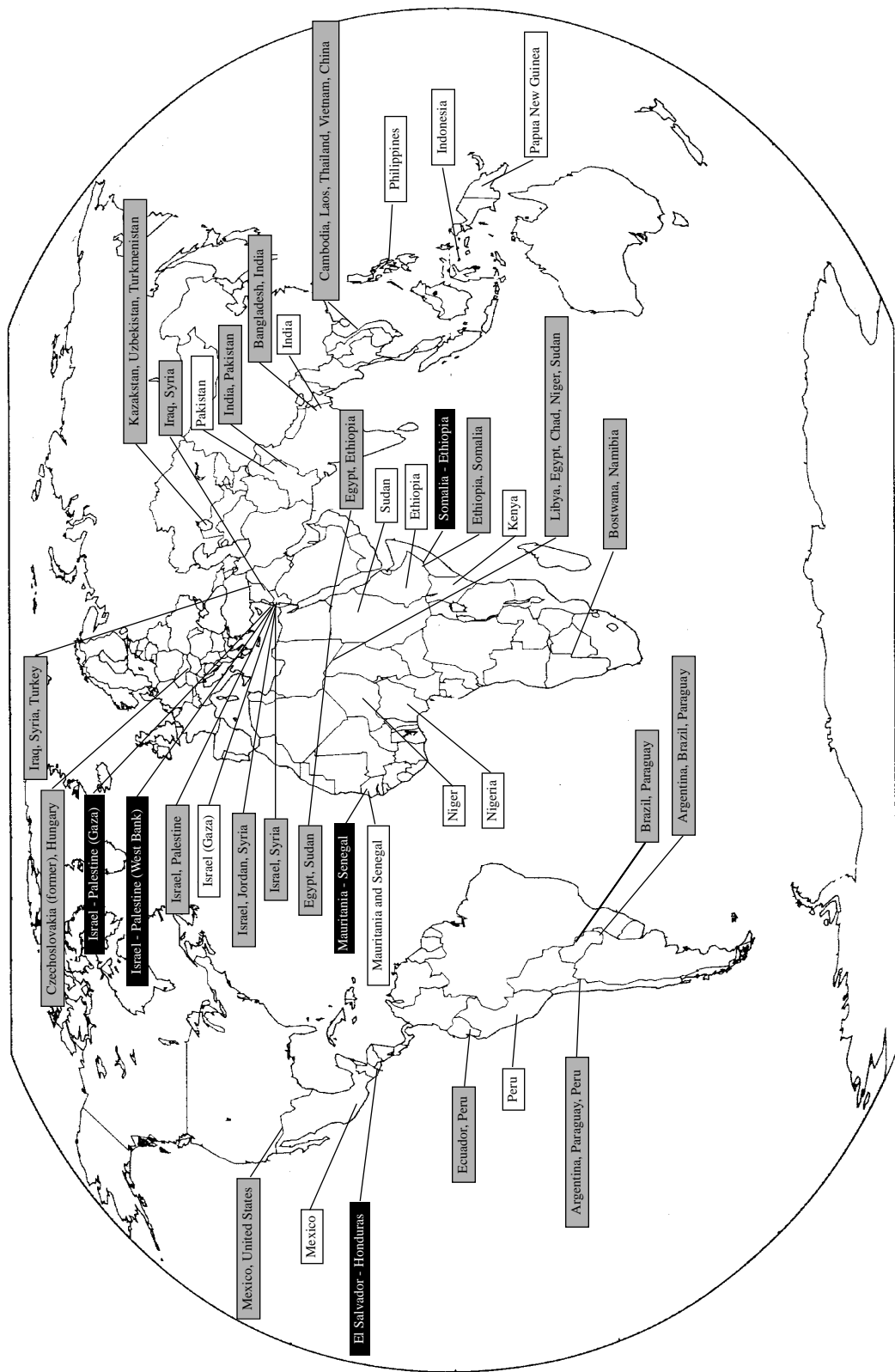
tor rather than an environmental factor. Nevertheless, it is instructive to note that population growth plays a primary role in generating most of the environmental factors considered below. Soil erosion, deforestation, and water pollution, for example, are all engendered, in large part, by population growth. Therefore, population growth should be considered a major factor in each of the case studies below.

Social Effect of Environmental Factors. This section gives a brief synopsis of the manner in which the environmental factors interact with other social and economic factors.

Conflict. Finally, the outcome of the interaction between environmental factors and other social and economic factors is briefly explained.

The map on the following page illustrates the areas affected by environmental conflicts and potential conflicts.

Environmental Conflicts — Past, Present and Potential



Key:

- Indirect Intranational Conflicts
- Indirect International Conflicts
- Direct International (Potential) Conflicts Over Water

Direct International Conflicts and Potential Conflicts* Over Water Resources[†]

Countries	Time Frame	Body of Water/ Territory	Key Environmental Factors	Conflict?	Primary Source(s)
India, Pakistan	1947-1960s	Indus, Sutlei	Irrigation	No	Bingham et al., 1994; Wolf, 1997
Bangladesh, India	1947-1996	Brahmaputra, Ganges	Water flow, siltation, flooding	No	Butts, 1997; Samson & Charrier, 1997
Israel, Jordan, Syria	1951; 1953	Jordan River, Yarmuk, Litani	Water flow, drainage, diversion	Yes (both dates)	Wolf, 1997; Samson & Charrier, 1997
Egypt, Sudan	1958	Nile	Water diversion, flooding, siltation	Yes	Wolf, 1997
Brazil, Paraguay	1962-1967	Parana	Water supply	No (military manoeuvres)	Murphy & Sabadell, 1986
Ethiopia, Somalia	1963-1964	Ogaden Desert water resources	Water supply	Yes	Wolf, 1997
Israel, Syria	1965-1966	Jordan River	Water diversion	Yes	Wolf, 1995 & 1997
Argentina, Brazil, Paraguay	1970s	Parana	Water flow	No	Wallenstein & Swain, 1997
Iraq, Syria	1974; 1975	Euphrates	Water flow	No (military force threatened in 1974; military manoeu- vres in 1975)	Gleick, 1993 & 1994; Wolf, 1997
Israel, Syria, Turkey	1990	Euphrates	Water flow	No	Gleick, 1993 & 1995
Czechoslovakia, Hungary	1992	Danube	Water flow, diversion	No (military manoeuvres)	Gleick, 1993
Ecuador, Peru	1995	Cenepa	Water supply	Yes	Samson & Charrier, 1997; Wolf, 1997
Cambodia, Laos, Thailand, Vietnam, China	1960s-present	Mekong	Water flow, flooding	No	Samson & Charrier, 1997

* "Potential conflicts" refer to current or past disputes that threaten(ed) to erupt into conflict because of tensions.

[†] Sources: Gleick, 1998; Renner, 1996.

Direct International Conflicts and Potential Conflicts Over Water Resources (cont'd)

Countries	Time Frame	Body of Water/ Territory	Key Environmental Factors	Conflict?	Primary Source(s)
Kazakstan, Uzbekistan, Turkmenistan	1960s-present	Aral Sea	Shrinking sea, water scarcity, salinization	No	Calder, 1998
Mexico, United States	1960s-present	Rio Grande	Water flow, salinization, pollution	No	Samson & Charrier, 1997
Israel, Palestine*	1970s-present	West Bank water resources	Water allocation, aquifer water rights	Yes	Renner, 1996
Egypt, Ethiopia	1978-present	Nile	Water flow	No	Gleick, 1991 & 1994
Argentina, Paraguay, Peru	1980s-present	Pilcomayo	Industrial pollution	No	Samson & Charrier, 1997
Bostwana, Namibia, Angola	1980s-present	Chobe	Water diversion	No	Samson & Charrier, 1997
Libya, Egypt, Chad, Niger, Sudan	1991-present	Okavango	Water diversion	No	Samson & Charrier, 1997

* Neither UNEP nor the authors of this report seek to pass judgement on the legal status of Palestinians by labeling the Israel-Palestine conflict under the heading of "International Conflicts." That the conflict is listed under this heading is a reflection of the manner in which it is treated in the literature from which this study derives its information. See, for example, Kelly and Homer-Dixon, *Environmental Scarcity and Conflict: The Case of Gaza*, 1995; Miriam R. Lowi, "West Bank Water Resources and the Resolution of Conflict in the Middle East," in Gleick, *Water and and Conflict*, 1992; Renner, *Fighting for Survival*, 1996.

Indirect Intranational Conflicts

Country(ies)	Time Frame of Conflict	Key Environmental Factors	Key Social/Economic Factors	Nature of Conflict	Primary Source(s)
Philippines	1970s & 1980s	Ecological degradation of land	Poverty, mobilization of socially marginalized peoples	Anti-government campaign	Myers, 1989 & 1993
Ethiopia	1980s	Soil degradation	Declining agricultural output, increased competition for scarce resources	Group conflict	Molvoer, 1991
Mexico	1994	Deforestation, soil erosion	Ecological marginalization, increased opportunities for uprising	Group rebellion	Howard & Homer-Dixon, 1995
Indonesia	1965-present	Resource extraction, deforestation	Uneven distribution of benefits from resource extraction	Group conflict	Barber, 1997
India (Northeast)	1979-present	Deforestation, flooding	Reduction of agricultural land, migrations, shifts in political power	Ethnic conflict	Hazarika, 1993; Homer-Dixon & Percival, 1996
Peru	1980-present	Soil erosion	Economic decline, increased relative deprivation of peasants	Anti-government campaign	Homer-Dixon & Percival, 1996
Pakistan	1981-present	Soil erosion, water pollution, deforestation	Economic decline, migrations, increased competition for resources	Ethnic and group conflict	Geweski & Homer-Dixon, 1996
Sudan	1983-present	Deforestation, desertification	Ecological and social marginalization, mobilization of marginalized peoples	Ethnic and group conflict	Ahmed, 1989
Mauritania and Senegal	Mid-1980's-present	Soil degradation, dam construction	Migrations, competition for resources	Ethnic conflict	Homer-Dixon & Percival, 1996
Papua New Guinea	1988-present	Pollution, mine tailings, toxic contamination	Resentment by Bougainvillians over pollution from mine, perceived lack of economic benefits from mine	Anti-government campaign	Renner, 1996
India (Bihar)	1980s-present	Cropland scarcity, deforestation, desertification	Rural-urban migration	Urban group conflict	Homer-Dixon, 1997

Indirect Intranational Conflicts (cont'd)

Country(ies)	Time Frame of Conflict	Key Environmental Factors	Key Social/Economic Factors	Nature of Conflict	Primary Source(s)
Niger	1990-present	Desertification, soil degradation	Economic decline, relative deprivation	Ethnic group - state conflict	Lume, 1996
Kenya	1991-present	Overfishing, water pollution, inappropriate cultivation practices, deforestation	Poverty, migrations, increased competition for resources	Ethnic conflict	Lang, 1995
Nigeria	1993-present	Pollution from oil exploration	Resentment over pollution and perceived lack of economic benefits from oil exploration	Group-state conflict	Renner, 1996
Israel (Gaza)	1994-present	Over-use of aquifer, agricultural pollution	Health problems, loss of legitimacy by Palestinian Authority	Group-government conflict	Kelly & Homer-Dixon, 1995; Falkenmark, 1989

Indirect International Conflicts

Countries	Time Frame of Conflict	Key Environmental Factors	Key Social/Economic Factors	Nature of Conflict	Primary Source(s)
El-Salvador - Honduras	1969	Deforestation, Soil Degradation	Agricultural land scarcity, migrations	100-Day War	Durham, 1979
Somalia - Ethiopia	1977-1978	Over-grazing of bush, deforestation	Economic decline, migrations	Military confrontations	Molvoer, 1991
Israel - Palestine (West Bank)*	1987-1992	Over-pumping of aquifers, salinity, water pollution	Agricultural decline, migrations, urban poverty	Group uprising	Homer-Dixon & Percival, 1996
Mauritania-Senegal	1989-1992	Soil Degradation, dam construction	Migration, competition for resources	Military confrontations	Homer-Dixon & Percival, 1996
Israel - Palestine (Gaza)*	1995-present	Over-use of aquifer, agricultural pollution	Economic decline, rise of fundamentalism	Protracted confrontations	Kelly & Homer-Dixon, 1995

* Neither UNEP nor the authors of this report seek to pass judgement on the legal status of Palestinians by labeling the Israel-Palestine conflict under the heading of "International Conflicts." That the conflict is listed under this heading is a reflection of the manner in which it is treated in the literature from which this study derives its information. See, for example, Kelly and Homer-Dixon, *Environmental Scarcity and Conflict: The Case of Gaza*, 1995; Miriam R. Lowi, "West Bank Water Resources and the Resolution of Conflict in the Middle East," in Gleick, *Water and Conflict*, 1992; Renner, *Fighting for Survival*, 1996.

INDIRECT INTRANATIONAL CONFLICTS

Philippines

Summary

The New People's Army (NPA) waged a insurgency in the rural Philippines during the 1970's and 1980's. Support for the NPA is bounteous amongst poor Filipinos', who have seen their economic situation grow progressively bleak. Economic woes can be traced, in part, to demographic and environmental pressures such as population growth, deforestation, and soil erosion, which have reduced the agricultural productivity of the land.

Environmental Factors

The average amount of arable land per rural inhabitant has declined to less than one acre, with some experts predicting a fall to 0.6 acres per capita by the year 2000. Three percent of landowners control one-quarter of the country, while 60 percent of rural families either cannot survive on their tiny plots or have no land at all. Alongside an uneven distribution of land resources, two important causes of land scarcity in the Philippines have been deforestation and soil erosion.

Deforestation and Soil Erosion. Once teeming with forests, woodlands are now confined to the

uplands in the Philippines. Deforestation has exacerbated soil erosion in the lowlands, causing agricultural productivity to fall in this area. Consequently, peasants have been force to migrate to the ecologically fragile upland regions en masse. The uplands population now totals more than 20 million people, or almost one-third of all Filipinos, with a rate of increase half again as large as that of the national population. This migration is now threatening the forests in the upland areas, forcing farmers onto ever more steep slopes, and perpetuating a cycle of deforestation, soil erosion, declining water supply (due in-part to upland deforestation), declining agricultural productivity, and relocation.

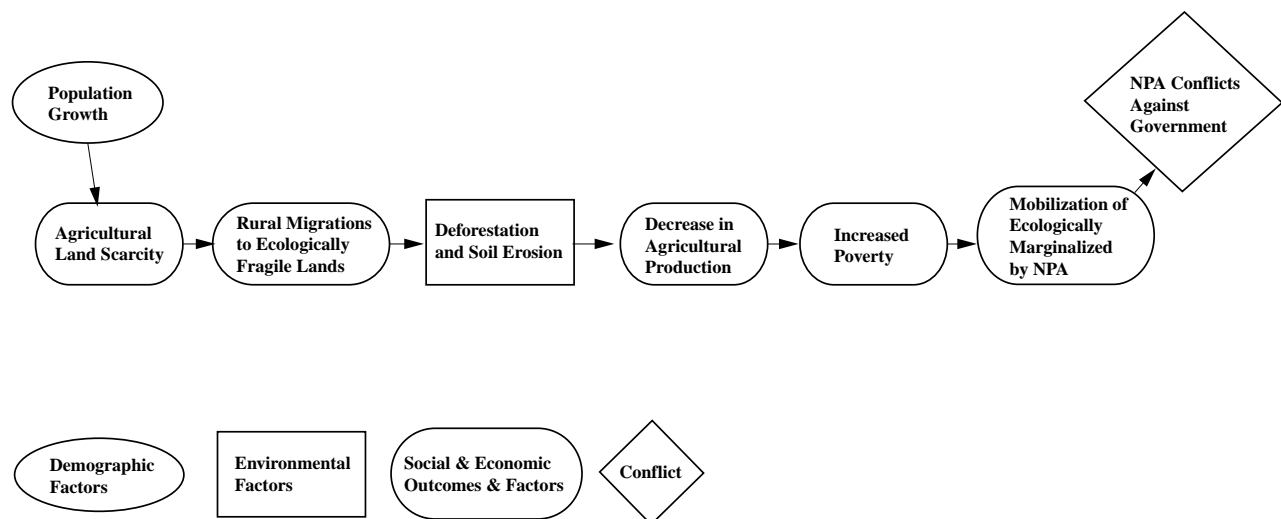
Social Effects of Environmental Conditions

About 70 percent of Filipinos depend on agriculture and fishing for their livelihood. Because many Filipinos' incomes are closely related to the productivity of the land , decreasing productivity has augmented poverty for many. There is a pervasive perception amongst poor Filipinos that the government has been particularly unresponsive to their plight.

Conflict: Philippines

Chronic poverty has raised grievances amongst poor Filipinos, who have subsequently been easily mobilized by the NPA's anti-government campaign.

Flow Chart of Environmental Conflict for Philippines Case Study



Ethiopia

Summary

During the famine that plagued Ethiopia in the 1980's, Afar pastoralists migrated into settled agricultural areas, which led to clashes between the agriculturalist and pastoralist groups. While the famine was brought on primarily by drought, conditions were aggravated by other demographic and environmental pressures including population growth and soil degradation.

Environmental Factors

One key environmental factor has combined with low seasonal rainfall, poor moisture balance, and recurrent invasion of desert locusts, to produce famine in Ethiopia: soil degradation.²¹ It is estimated that 50 percent of the highlands are significantly eroded, while 25 percent are seriously eroded and 4 percent are beyond recovery.²²

Social Effects of Environmental Conditions

Famine, brought on by a combination of drought conditions and environmental stresses, forced the Afar pastoralists to seek out fertile land in areas that were traditionally farmed by agricultural groups.

Conflict: Ethiopia

The migration of pastoralists to land traditionally farmed by agricultural groups, increased competition for already scarce resources, and led to protracted conflicts between the two groups.

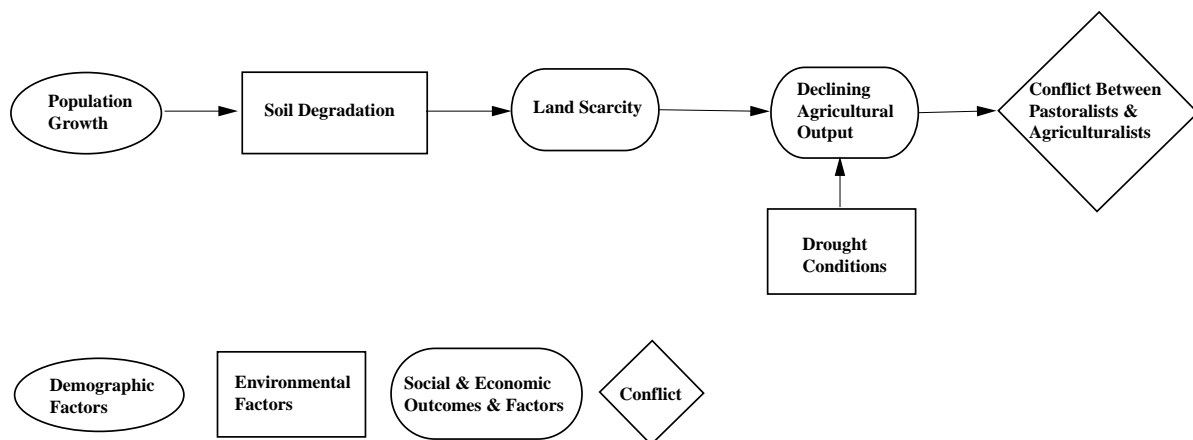
Mexico

Summary

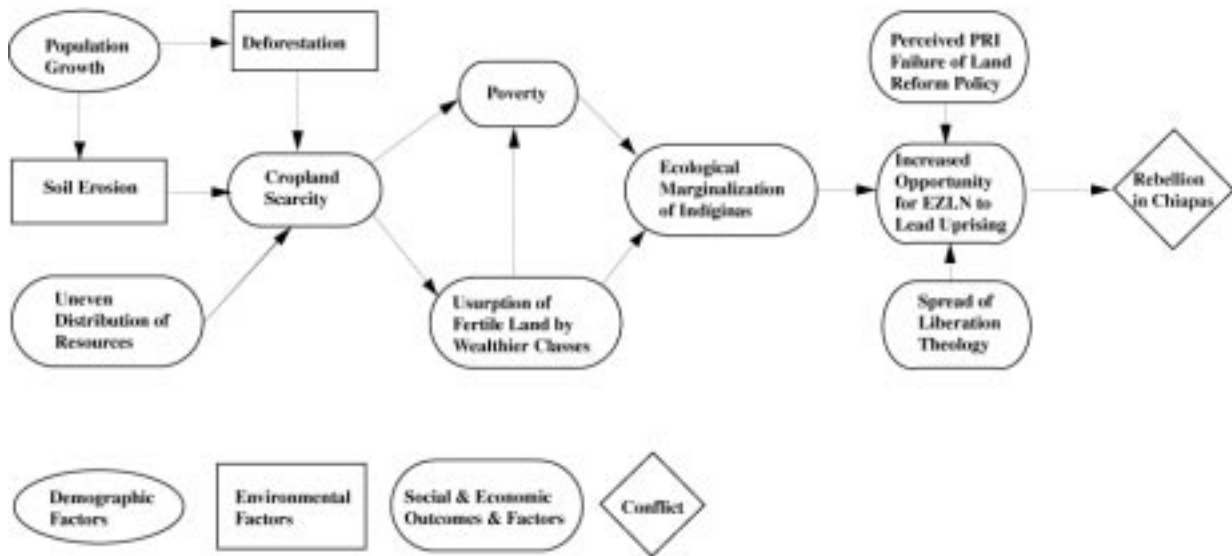
Throughout the history of Chiapas, the wealthier social groups have gained access to the most agriculturally productive lands, while the the indígenas (indigenous peoples) and campesinos (spanish-speaking subsistence farmers) have only been able to access the less fertile lands. While the 1917 Mexican Constitution aimed to redistribute land to ecologically marginalized peoples, there was a widespread feeling among the indígenas and campesinos that the Partido Revolucionario Institucional (PRI) was intentionally sidestepping this principle as part of its overall 1992 economic reform policies.

This perceived inaction, combined with a weakened Mexican government and an increasingly dissatisfied peasantry — impoverished from declining environmental conditions and expanding cropland scarcity — generated an opportunity for a rebellion led by the Ejercito Zapatista de Liberacion Nacional (EZLN or commonly Zapatistas).

Flow Chart of Environmental Conflict for Ethiopia Case Study



Flow Chart of Environmental Conflict for Chiapas, Mexico Case Study



Environmental Factors

Two key environmental factors have interacted with an uneven distribution of land and credit — as well as inadequate access to social infrastructure such as potable water and electricity — to produce a scarcity of agricultural land for the Chiapan peasantry: deforestation and soil erosion.

Deforestation. In Chiapas, deforestation has been severe, especially in the Lacandon Rain Forest which is situated in the eastern lowlands. Many ecologically marginalized peoples have been forced to earn a living in the eastern lowlands, and the eastern lowlands is also where the Zapatistas draw their greatest support. Deforestation has been especially acute in this region, in part because of the peasantry’s reliance on fuel wood for their energy supplies. Between 1974 and 1986, the Lacandon Rain Forest was reduced by 7.7 percent annually, and 42 percent was overtaken by secondary forests.

Soil Erosion. Caused by a combination of natural factors such as heavy rainfall and winds, deforestation, and unsustainable agricultural practices, soil erosion has also been severe in several parts of Chiapas: over 6 percent of the Lacandon Rain Forest was lost to soil erosion between 1974 and 1986; between 20 and 50 percent of the highlands is affected by soil erosion; and up to 5 percent of the major coffee producing region along the coast has been severely degraded by waterlogging.

Social Effects of Environmental Conditions

As a result of increasing cropland scarcity and the widespread perception amongst Mexico’s peasantry of the inaction on the part of the PRI with regards to land rights, the wealthier socio-economic groups in Chiapas were able to solidify their control over the most agriculturally productive land. Peasants were thereby forced to move to the periphery of the Lacandon Rain Forest, where newly cleared land was either quickly degraded by over-use and unsustainable agricultural practices, or usurped by the land-owning groups. This process of ecological marginalization intensified, inflicting chronic land shortage and poverty on the indígenas and campesinos.

Conflict: Chiapas

The Zapatista-led rebellion of 1994 bred from a combination of: increasing grievances by an ecologically marginalized peasantry; decreasing state capacity to fulfill the social requirements of these groups of people; and an expanding occurrence of grass-roots action inspired by liberation theology. The Zapatistas were able to utilize this set of circumstances. They effectively used long-standing social cleavages, and successfully laid blame for the plight of the peasantry on the government regime.

India (Northeast)

Summary

While Bangladesh has always been prone to natural disasters, environmental pressures such as deforestation and human encroachments have exacerbated flood conditions and reduced the availability of natural resources for Bengalis. Consequently, millions of Bengalis have migrated into the states of Assam and Tripura in Northeast India. The migrations have shifted the balance of political power in these states, threatened indigenous culture, and increased competition over resources. As a result, ethnic clashes have broken out in both states, claiming the lives of thousands of individuals.

Environmental Factors

Two key environmental factors have played a role in the exacerbation of natural flooding and reduction of available fertile agricultural land in Bangladesh: deforestation and increasing human encroachments close to river banks.

Deforestation and Human Encroachments. Bangladesh is extremely vulnerable to natural disasters and experiences a regular cycle of floods, cyclones, and drought. Many experts agree, however, that by reducing forest coverage through upstream deforestation of the Himalayas, soil is

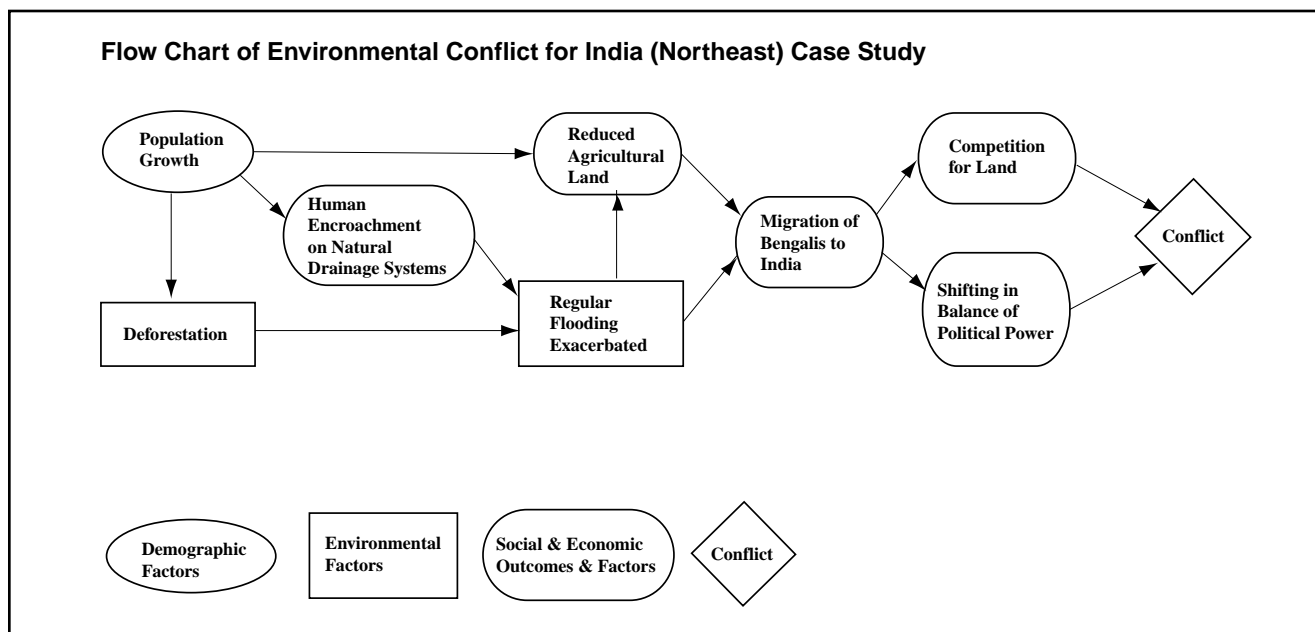
exposed to rain and winds, and flooding is exacerbated.

Flooding reduces the availability of fertile cropland. During the annual floods, one-third of the country is covered in flood waters, making all types of agriculture virtually impossible. The 1988 floods — one of the worst Bangladesh has ever experienced — reduced rice production by 1.6 million tons.

Human encroachments and settlements have also exacerbated flooding in Bangladesh: natural drainage systems have been blocked, embanked or damned (embankments designed to keep floods out often end up trapping flood waters within vast areas for months at a time); natural depressions and wetlands continue to be usurped for agricultural purposes; and road construction has made low-lying areas more vulnerable to flooding by using up large quantities of soil.

Social Effects of Environmental Conditions

Partly as a result of the environmental pressures, subsequent impoverishment of the people, and relative attraction of neighboring India, over 10 million Bengalis — close to 20 million when their descendants are included — have migrated to Northeast India in the last four decades, with a substantial portion of that migration occurring after 1974.



Conflict: Assam and Tripura

Bengali migration to Northeast India has triggered a series of episodes in the states of Assam and Tripura. In Assam, Bengali migrants were perceived as an economic competitor (e.g. increased competition for agricultural land), religious outsiders (Bengali migrants are primarily Muslim while the indigenous Assamese are mostly Hindu), and a political threat (Muslim migrants developed significant political and institutional sway).

Between 1979 and 1985, the differences between the native population and newcomers emerged after a hotly contested plebiscite on the issue of “illegal aliens,” and ethnic rioting occurred, resulting in the death of more than 4,000 people.

As a consequence of Bengali migration (predominantly Muslim migrants) into the state of Tripura, the indigenous population (mostly Buddhists and Christians) have become a minority. Frustrated by their demise in political power, a dispute began in 1980, leading to the death of hundreds of Bengalis. Although the tension has ceased, attacks on government officials still occur.

Peru

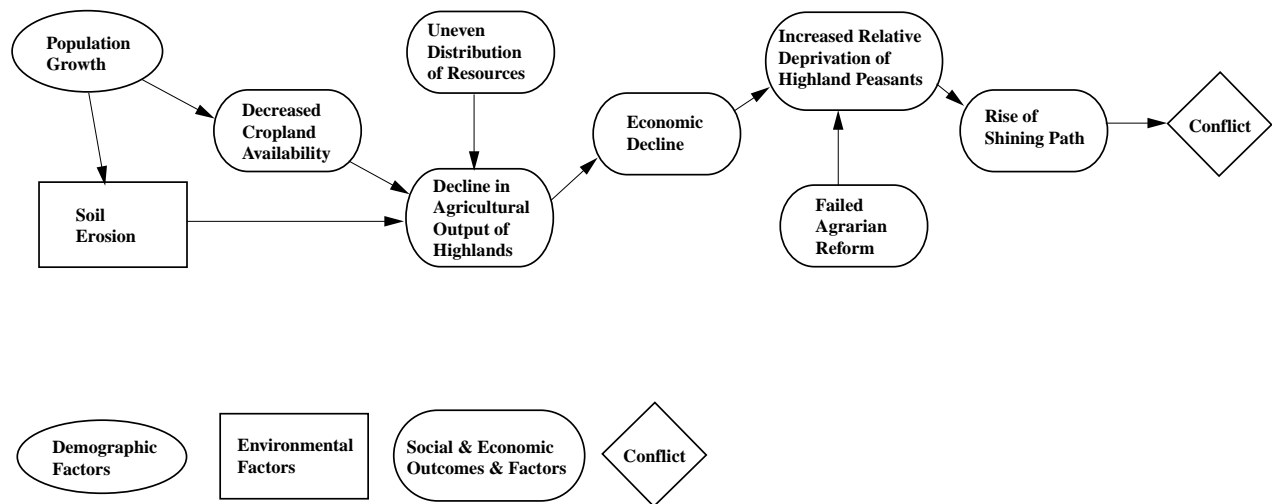
Summary

In May of 1980, Peru’s Sendero Luminoso, or “Shining Path”, began a campaign that spanned a decade and claimed tens of thousands of lives. Sendero Luminoso arose because a subsistence crisis — that was causing severe economic decline and hardship in Peru’s southern highlands, especially in the Ayacucho area — roused grievances and a sense of relative deprivation in the region’s peasantry.²³ Although the economic plight of the highland peasants can, in part, be traced to neglect from successive governments, the particularly drastic decline in agricultural production was the result of environmental pressures.

Environmental Factors

The southern highlands are an ecologically fragile area, unsuitable for agriculture. By 1980, population growth reduced cropland availability to below 0.2 hectare per capita. Soil degradation, caused by erosion and nutrient depletion, further degraded this resource base. The land became unable to produce a sufficient amount of food for the region’s subsistence-based farmers.

Flow Chart of Environmental Conflict for Peru Case Study



Social Effect of Environmental Conditions

Decreasing agricultural output created an economic crisis for the southern highland peasantry. Family incomes dropped severely in the 1970's and 1980's. In 1980, per capita income in the Peruvian highlands was 82 percent of the 1972 level. As a result, food intake for the peasantry dropped well below internationally accepted standards: In 1980, people in the southern highlands had less than 70 percent of the UN Food and Agricultural Organization daily requirement.

Conflict: Peru

Coupled with the perceived failure of a major agrarian reform attempt, instituted by the military government between 1968 and 1980, grievances within the population mounted.²⁴ Young, university-educated radicals, who had little opportunity for employment upon graduation, forged an alliance with the region's peasantry. A social protest movement began, which quickly turned into a terrorist movement led by Sendero Luminoso. A strong correlation developed between the degree of suffering felt by areas within the highlands and the degree of support shown for the Sendero Luminoso.

Pakistan

Summary

In the last decade, Pakistan has experienced a growing number of incidents. The clashes are usually social or ethnic-based, and occur most frequently in large urban centers such as Karachi.

The root of the violence can be traced, in part, to growing demographic and environmental pressures such as population growth, soil erosion, deforestation, and water pollution. These pressures have generated a shortage of land and water in Pakistan. In the rural areas of the country, small farmers have been forced off the land by large land-owners, which has heightened tensions between the have and the have-nots and led to periodic violence between these two groups. The decreased agricultural output stemming from the scarcity of land and water has also induced a massive rural migration to large urban centers in

Pakistan. The inability of an already weak government to meet the increased demands of these overcrowded urban centers has deepened ethnic cleavages and generated numerous incidents.

Environmental Factors

Three key environmental factors have combined with an already uneven distribution of resources, to produce water and land scarcity in Pakistan: water pollution, deforestation, and soil degradation.

Water Pollution. The increasing demands on water resources from a swelling population, has combined with a naturally arid climate to produce a chronic shortage of water in Pakistan. Further aggravating this water scarcity is the heavy silting of water reservoirs, which prevents Pakistan from storing excess water (from periods of high precipitation) for periods of drought; and an inadequate sewage system which had polluted Pakistan's rivers with domestic and industrial waste.

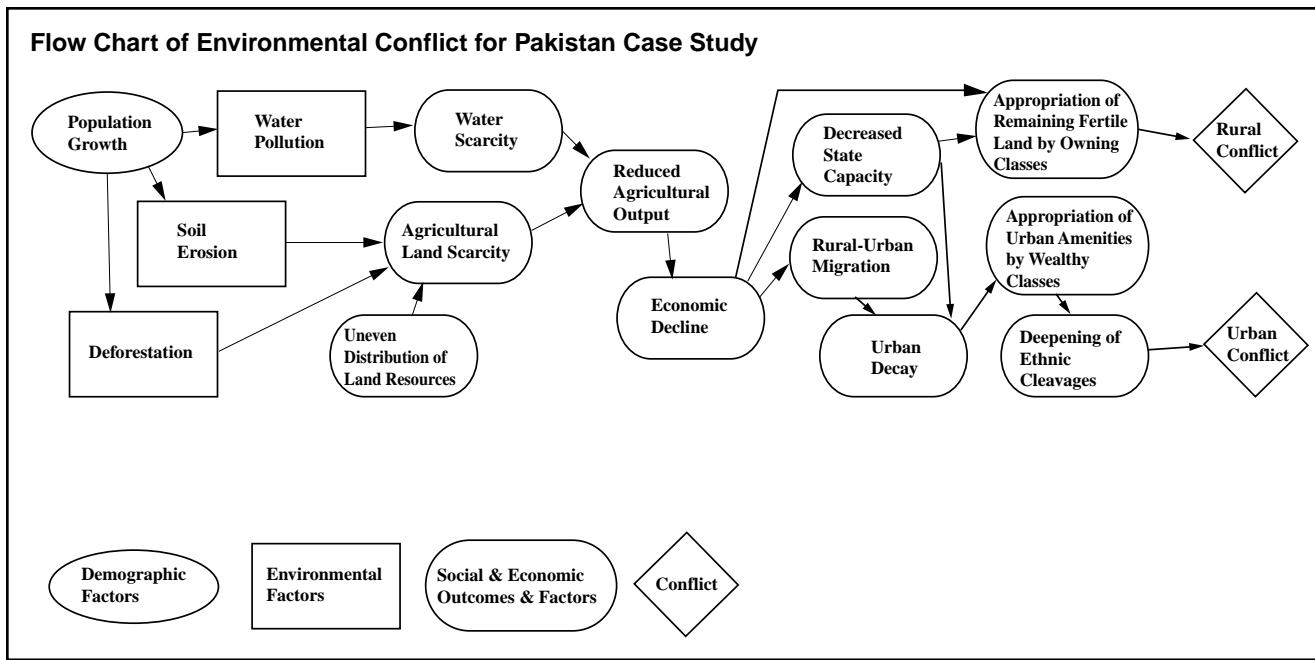
Deforestation and Soil Degradation. Due to an increasing demand for new agricultural land and a continued reliance on fuel wood, forest cover has decreased from 14.2 percent to 5.2 percent of Pakistan's total land area. Deforestation, coupled with salinity, sodicity, waterlogging, flooding, and loss of organic matter, have rendered 62 percent of Pakistani land unfit for crop, livestock, and forestry production.

Social Effects of Environmental Conditions

Land and water scarcity in Pakistan has threatened to produce a significant decline in total agricultural production, and has already led to a decline in the efficiency of small farms. While total agricultural output has been rising at an average of 4 percent per annum, unsustainable agricultural activity has rendered output highly vulnerable to sharp downturns.

Constraints on agricultural activity has produced significant economic hardships for many rural Pakistani farmers. About one-quarter of farmers are forced to supplement their agricultural earnings by other means, and underemployment is severe.

Declining agricultural activity has produced an overall economic downturn, especially for marginal societal groups. While overall GDP has



been strong, structural weaknesses in the economy have weighed disproportionately on the poorer segments of Pakistan's population. Agricultural and economic decline, in turn, have reduced the capacity of the state to respond to the growing numbers of economically marginalized individuals in Pakistan.

Conflict: Rural and Urban Pakistan

In rural Pakistan, land scarcity has prompted the economically strong social groups to access the most productive land and forests, thereby forcing small farmers to ecologically marginal lands. In the wake of their ecological marginalization, organized gangs have formed with increasing regularity. Their illegal activity has sparked a series of reprisals from the land-owning elite. Although widespread conflict has been avoided, incidents occur regularly.

Ecological marginalization has also forced many rural Pakistanis to migrate to large urban centers. Swelling urban populations have exacerbated urban slums which suffer from a chronic shortage of basic urban resources such as tap water. Coupled with the authorities' difficulties to meet these growing demands, the economically strong social groups have successfully appropriated urban amenities which they rent or resell at excessively high costs to poor immigrants. Economic inequalities have heightened tensions

between long-standing ethnic rivals, and created conditions with a high potential for violence. Urban violence has been occurring in the cities of Hyderabad, Islamabad, and Rawalpindi. The most severe incidents have occurred in the nation's capital, Karachi. In Karachi, competition over increasingly scarce urban resources such as electrical power, have induced a series of incidents between the Punjabis, Pathans, and Sindhi peoples.

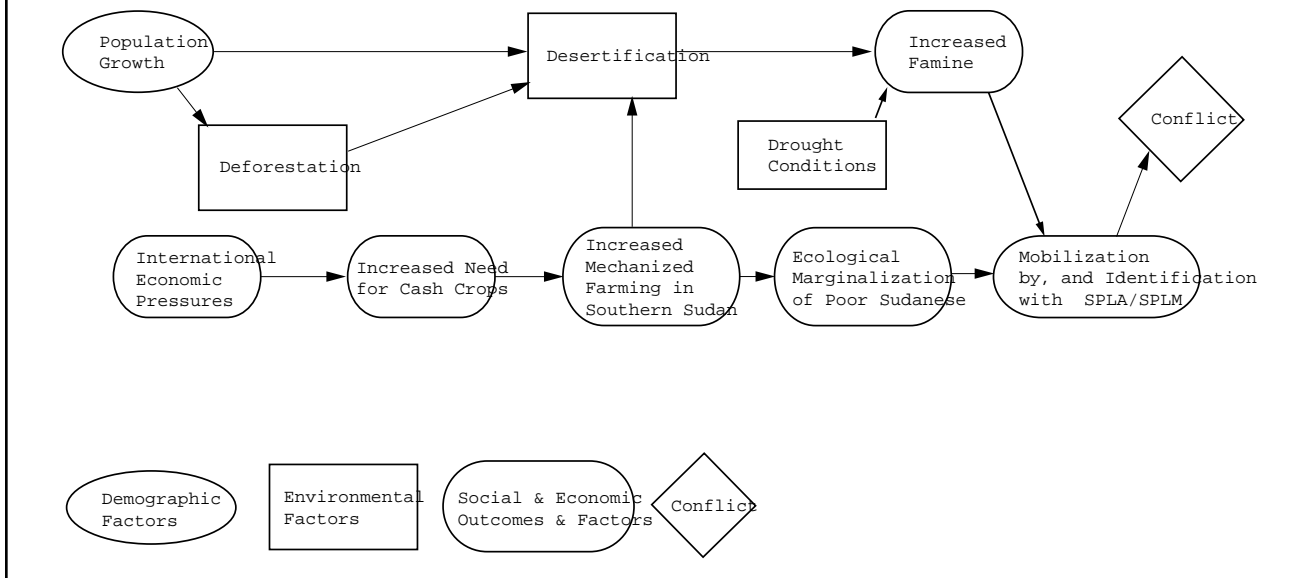
Sudan

Summary

Devastated by civil war between north and south that engulfed the nation from 1966-1972, Sudan once again witnessed an outbreak of north-south violence in 1983 that continues to the present date.

Impelled by a restructuring of the international economy, and constrained by a legacy of colonial rule that conferred only the capability for resource extraction to the exclusion of industrialization, the Jallaba (Arab Sudanese with relative wealth and political power) introduced large-scale mechanized farming to Northern Sudan after independence was achieved in 1956. By the 1980's, arable land scarcity, induced in part by the environmental ramifications of mechanized farming and in-part by a shortage of rainfall, forced the Jallaba to move

Flow Chart of Environmental Conflict for Sudan Case Study



southward in search of virgin land and untapped resources. Development projects in Southern Sudan incited grass-roots mobilization by southern Sudanese and ecologically marginalized northern Sudanese. With the formation of the Sudan People's Liberation Army (SPLA, later the Sudan People's Liberation Movement - SPLM), the marginalized people had a means to pursue action. Violence broke out not long after, when the SPLA organized attacks against the installations of the Jonglei Canal and several oil-exploration companies.

Environmental Factors

Three environmental factors were responsible for producing a scarcity in the amount of available agricultural land in Northern Sudan: soil degradation, deforestation, and a reduction in rainfall.

Soil Degradation. Large-scale mechanized farming has contributed to increasing soil degradation and desertification in Sudan. Half of the total usable land has experienced severe topsoil loss in Northern Sudan.

Deforestation. With an increasing demand for fuel wood (caused in part by a growing population) and the advent of large-scale mechanized farming (which demand a constant pursuit of virgin soil), forests in Northern Sudan have been decimated. At current rates of consumption versus regeneration and afforestation, all forest area in

Northern Sudan is expected to be denuded by the year 2003.

Reduced Rainfall. Sudan experienced a precipitation decrease of nearly 50 percent over the last 15 years. Consequently, periodic droughts suffered by certain regions in Sudan have intensified and been prolonged significantly. While "natural" causes have been blamed for the intensification and prolongation of droughts, many experts believe that both overgrazing and deforestation as well as global warming, have exacerbated drought conditions.

Social Effects of Environmental Conditions

The exhaustion of northern resources forced the Jellaba to expand their search for virgin lands into Southern Sudan. By the end of the 1970's, the Jellaba had begun a number of schemes based on the oil, water, and land resources in the south (e.g. Chevron oil explorations and export-pipeline scheme, construction of Jonglei canal, and expansion of mechanized farming into southern Kordonfan and the northern sections of the upper Nile).

Conflict: Sudan

The southern Sudanese responded to the development schemes of the Jellaba by forming the SPLM/SPLA. The first attacks by the SPLM/SPLA

were directed against the installations of oil exploration companies and the Jonglei Canal. A growing number of ecologically marginalized and impoverished Northern Sudanese joined the SPLM/SPLA.

Mauritania and Senegal

The intranational portion of this conflict is covered under the Mauritania-Senegal case study in the “Indirect International Conflicts” section which follows.

Kenya

Summary

The ability of Kenyan society to avoid large-scale civil war (despite numerous analysts’ predictions to the contrary) notwithstanding, the country has experienced significant violence. Ethnic clashes, between various tribes, such as amongst pastoralists as well as between pastoralists and farming tribes, has become more evident and acute over time. In particular, the clashes between the Kalenjin (as well as other pastoralists) and Kikuyus, have become acute since 1991. Clashes

have claimed the lives of thousands of individuals, and continue to the present date.

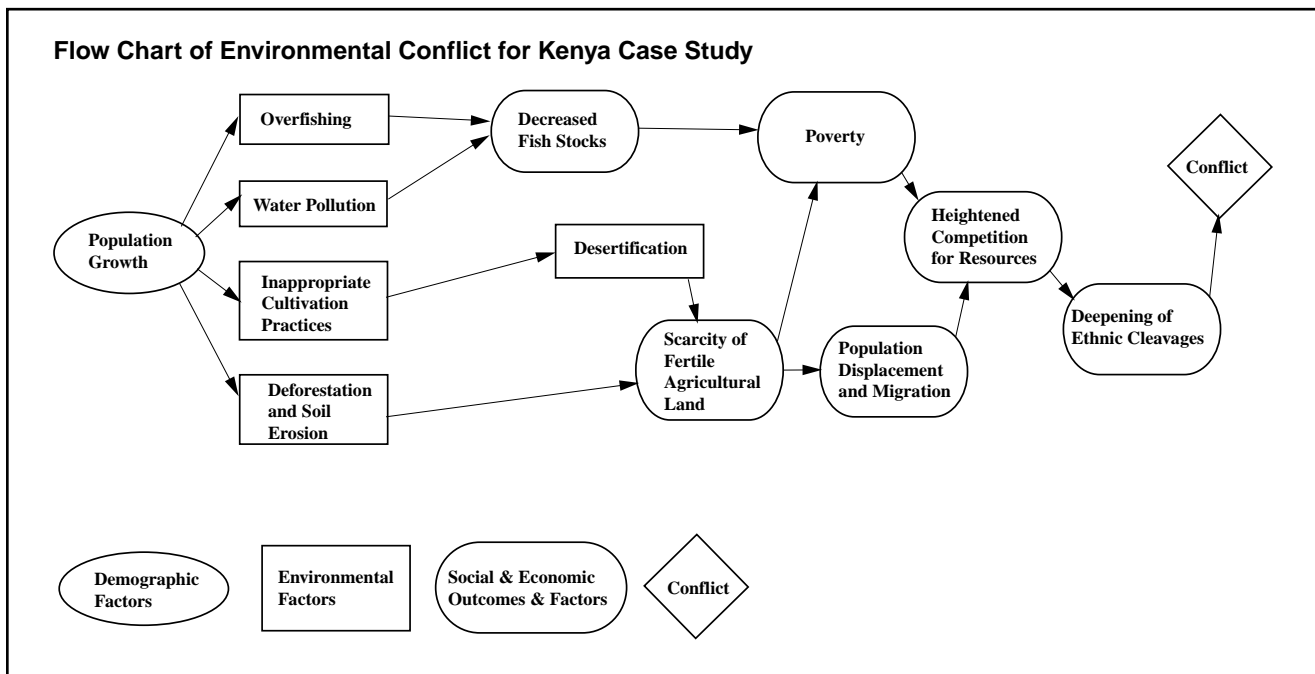
Environmental and demographic stresses have often precipitated these episodes. A growing population combined with unsustainable ecological practices have resulted in a significant depletion of available resources, which in turn has led to impoverishment, migrations and clashes over access to remaining resources.

Environmental Factors

Three key environmental factors have played a role in the decrease of available fertile agricultural land and depletion of fish stocks: overfishing and water pollution, deforestation, and desertification.

Overfishing and Water Pollution. Lake Victoria, by surface area the third-largest fresh water lake in the world and an extremely important source of fish for Kenya, has experienced significant reduction in fish stock levels. This reduction can be attributed in part to overfishing and toxic chemicals flowing in from the seven Kenyan rivers that feed lake Victoria.

The sustainable yield for Lake Victoria is approximately 100,000 metric tons per year. This figure has been exceeded numerous times in the last decade. In 1991, Kenyans alone caught 186,000 metric tons. Kenyan share of Lake Victoria is about 10 percent. Therefore the total degree of overfishing in Lake Victoria is a magnitude higher.



Rivers carrying pollutants (e.g. smoke particles deriving from the burning of forests and fields in the hinterland) flow into Lake Victoria. These pollutants have resulted in a massive influx of nitrogen, phosphorus, and sulphur, which has boosted the reproduction of oxygen-usurping seaweed in the lake and led to a “death zone” for fish which is already over 40 meters thick.

Deforestation. Between 1970 and 1990, Kenya lost 11,450 hectares of forests. One of the primary effects of this deforestation has been a reduction in soil quality. By exposing the soil to wind and rain, deforestation has led to a reduction in cropland availability and cropland production.

Silting caused by soil erosion has also resulted in the near disappearance of Lake Jipe and Lake Bogoria, and has systematically reduced the water table of Lake Turkana — Kenya’s second largest lake.

Desertification. Inappropriate cultivation practices, over-cultivation, and the use of toxic chemicals and pollution, have all contributed to Kenya’s alarming desertification. Nearly 483,860 km² (83 percent of the total area of Kenya) are affected by desertification to varying degrees. Close to 110,000 km² can be considered severely affected, while 53,000 km² show moderate signs of desertification.

Social Effects of Environmental Conditions

Depleted fish stocks and increasingly scarce fertile land have resulted in two social effects: economic decline and migrations.

Economic Decline. While Kenya has faced droughts for many decades, the effects of these droughts in combination with the pressures of a scarcity in viable agricultural land and renewable fish stocks contributed to economic hardship for Kenyans. Food imports and food aid are still needed in Kenya.

Migrations. The Kikuyu peoples, who received special privileges during colonial rule have been migrating out of fertile highlands in search of new land since the 1960’s. Migrations have intensified in the last two decades. Many Kikuyu peoples have migrated to the Rift Valley, where the Kalenjin peoples and other pastoralists reside.

Conflict: Kenya

Clashes between various groups began in 1991, intensified in 1992, and continue to the present date. The most prominent clashes have occurred between the Kalenjin “warriors” as well as members of pastoralist tribes such as the Masaai, and the Kikuyu peoples. Tribe members of the Luo, Luhya, Kisii, Kamba, Meru, and Teso, have also been targets of the Kalenjin “warriors” and the Masaai.

Migrations have contributed to these clashes. Economic decline has also fuelled these conflicts by making competition over already scarce resources more intense. The violence has taken a serious toll on the Kenyan nation. Before the end of 1993, some 1,500 persons had been killed, about 1 percent of the population has been displaced, and the area affected covered about 25 percent of Kenya. More recently, in 1994, the clashes spread to areas that formerly were calm, such as parts of the Coast and Western Pokot. In that area, up to 10,000 people are feared dead.

Israel (Gaza)

The intranational portion of this conflict is covered under the Israel-Palestine (Gaza) case study in the “Indirect International Conflicts” section which follows.

**INDIRECT INTERNATIONAL
CONFLICTS**

El Salvador - Honduras

Summary

On July 14, 1969 El Salvador launched an invasion of Honduras commencing a battle that has been coined the “*Soccer War*.” The war lasted only 100 days, but claimed the lives of several thousand individuals, turned 100,000 into homeless and jobless refugees, and inflicted severe economic losses on both nations.

Environmental and demographic stresses played a key role in the outbreak of war between El Salvador and Honduras. A combination of rapid population growth, inequitable access to resources, and degradation of available resources, forced marginal groups in El Salvador to migrate to Honduras in search of new resources. Large landowners in Honduras redirected blame for the economic plight of poor Hondurans, by pointing to the new immigrants as the primary culprits in a diminishing and increasingly degraded resources base. Hondurans reacted by expelling the El Salvadoran immigrants. El Salvador responded to this expulsion by closing its borders to Honduran refugees, and eventually declaring war on Honduras.

Environmental Factors

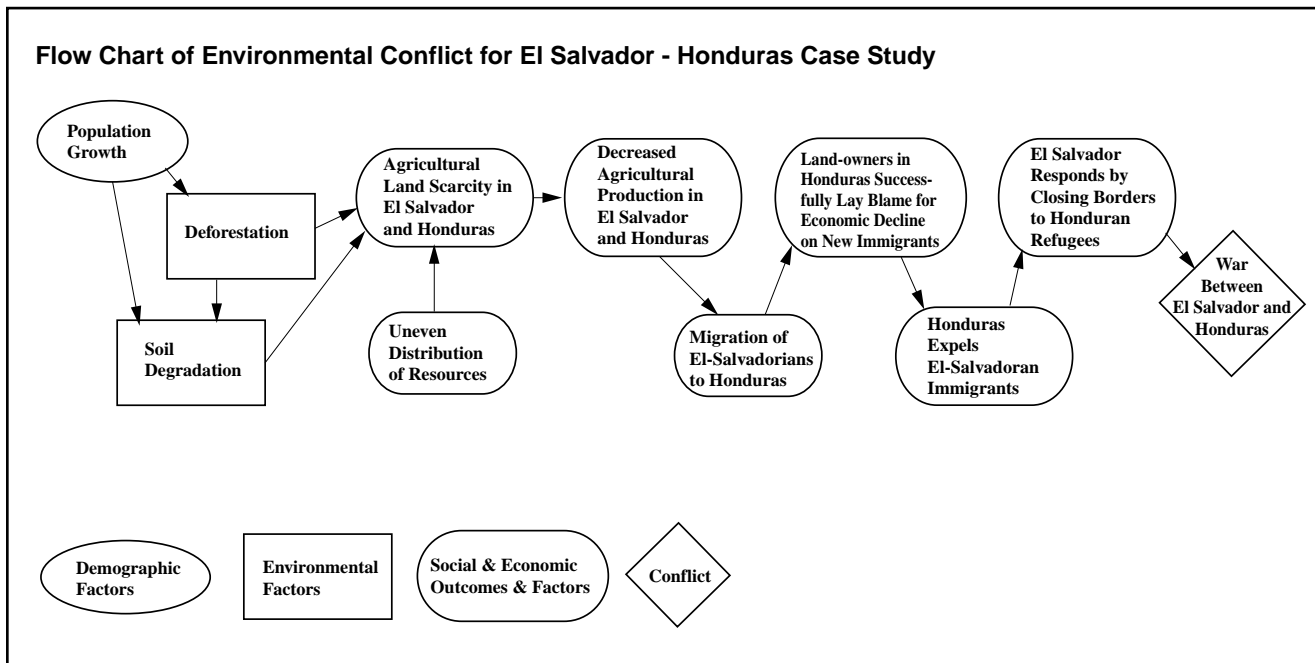
Two key environmental factors interacted with an uneven distribution of land to create a scarcity of arable land, and a subsequent decrease in agricultural productivity in both El Salvador and Honduras: deforestation and soil degradation.

The role that inequitable resource distribution played in both the migration of El Salvadorans to Honduras, and in the increased scarcity of resources in Honduras that precipitated the expulsion of El Salvadoran immigrants is emphasized by the underlying research.

Deforestation and Soil Degradation. In 1969, El Salvador had depleted nearly the entire stock of its virgin forests. Combined with the over-irrigation of the small tracts of land that they had been forced onto by large landowners, soil quickly eroded and food production fell rapidly. Similar conditions prevailed in Honduras.

Social Effects of Environmental Conditions

Faced with growing resource shortages and declining agricultural activity, small farmers in El Salvador began to migrate to Honduras — which was perceived as a country with greater resource abundance. Close to 300,000 Salvadorans migrated to Honduras.



Conflict: El Salvador and Honduras

Small farmers in Honduras, like their Salvadoran counterparts, were forced onto small tracts of land by large landowners in the 1960's. A cycle of poverty for small Honduran farmers began, which increased environmental degradation and diminished agricultural productivity.

The arrival of Salvadoran immigrants exacerbated resource competition between the large and small farmers in Honduras. Large landowners blamed the Salvadoran immigrants for the economic woes of the small Honduran farmers. The Salvadoran immigrants were subsequently expelled from Honduras, which prompted El Salvador to retaliate with refugee restrictions of their own. The political battle quickly escalated, and climaxed on July 14, 1969, when El Salvador invaded Honduras.

contributed to conflict by escalating competition over increasingly scarce resources.

Environmental Factors

One key environmental factor has combined with increasing drought and famine conditions, to provoke increased migrations of the Ishaq into the Ogaden areas: desertification due to congestion and overgrazing.²⁵ Environmental stresses were intensified as the animal population increased vastly with the growing demand for meat exports to the Middle East in the 1950's, 60's, and 70's.

Social Effects of Environmental Conditions

Due to population growth and concomitant desertification, the Ishaq of northern Somalia have been forced to augment the rate of their periodic migrations to the Haud.

Somalia - Ethiopia

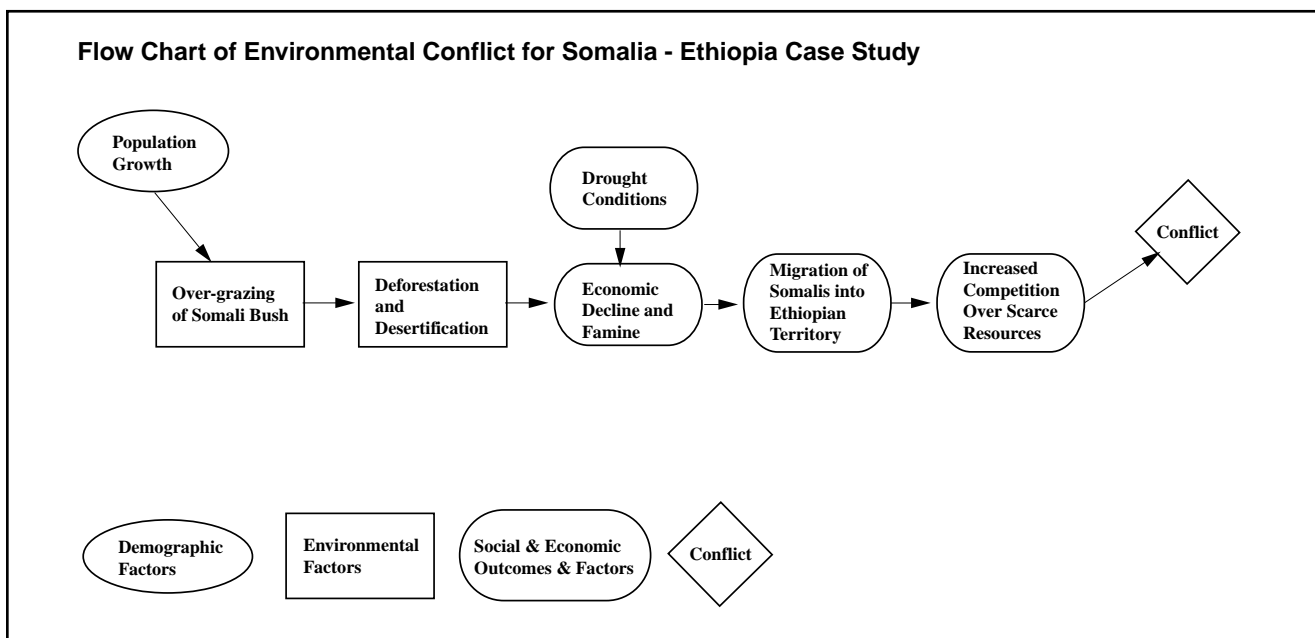
Summary

Conflicts between the Ishaq and Ogaden (two Somali pastoralists groups; the latter of whom occupy the Haud in eastern Ethiopia), have been occurring for decades. In the last two to three decades, however, these conflicts have been exacerbated by environmental stresses, which have

Conflict: Ethiopia and Somalia

In 1947, an official report about northern Somalia expressed fear that "irreversible ruin" may hit the soil and vegetation of the area due to congestion and overgrazing; and the "Official Report" for 1952-53 stated that 80 persons had died in disputes over grazing and watering rights.²⁶

In more recent decades, the increased migration of the Ishaq into the Haud has generated con-



flict between this latter pastoralist group and the Ogaden. These clashes contributed to the war between Somalia and Ethiopia in 1977-78, and “the dispute between the two main clan families has had repercussions in internal Somali politics right up to the present.”²⁷

Israel - Palestine (West Bank)

Summary

In 1967 Israel went to war against the Arab nations, partly because the Arabs had tried to divert Jordan River headwaters that feed Israel.²⁸ Since the 1967 war, water has remained a priority in Israel’s security strategy. Water is intimately tied to Israel’s political culture, and the West Bank aquifer provides 25-40 percent of Israel’s water.²⁹ The state of Israel has, however, been unable to adequately address the issue of water scarcity in the West Bank. Consequently, water shortages continue to hamper Israeli-Arab relations. The Intafadah, which began in the West Bank and lasted from 1987 to 1992, was in part a function of mounting poverty and ascending grievances induced by water scarcity. More recently, the transition to Palestinian autonomous rule in the West Bank remains vulnerable to the economic and social pressures created by water shortages.

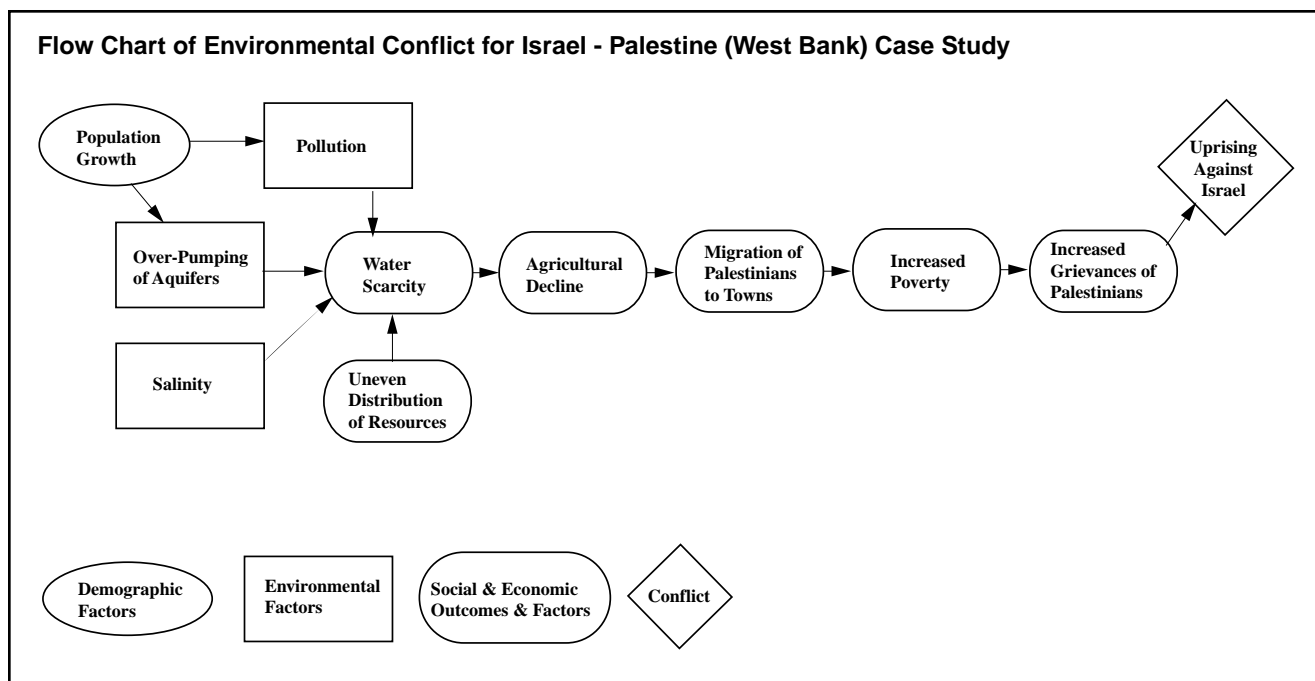
Environmental Factors

One key environmental factor combined with an uneven distribution of water in the West Bank produced water scarcity: pollution of water resources.

The uneven distribution of water in the West Bank is a primary factor in the water shortage faced by West Bank Palestinians. Palestinian experts generally acknowledge that Israel provides requisite water to the West Bank for domestic and industrial use. They nevertheless claim that Israel refuses to provide sufficient water for agricultural expansion, which is viewed as the life-force of economic viability for West Bank Palestinians.³⁰

Water Pollution. Israel’s population, which currently stands at 5.8 million, is expected to increase to over 6.7 million in the year 2020. Although this population growth rate is not alarmingly high, the current demand for water resources already exceeds the available supply. Israel’s annual renewable freshwater supply is roughly 1,950 m³, while current demand is 2,150 m³. By the year 2020, the country’s water demand will exceed 2,600 m³.

As a result of the increasing demand, the Israel government limited the prerogative of Palestinians to drill wells, while simultaneously allowing this practice of Jewish West Bank settlers. Where well-drilling for Jewish settlements is carried out in close proximity to Palestinian springs or wells, the



result has frequently been a marked decline in the output of these springs and a lowering of the water levels in the wells. Moreover, the shallower and less geologically-sound wells dug by the Palestinians are more susceptible to salinization and salt-water intrusion, as well as to pollution from industrial and agricultural run-off. Thus, the supply of water is also reduced by contamination.

Social Effect of Environmental Conditions

The scarcity of water, felt most acutely by the Palestinian population, has severely reduced agricultural output in the West Bank. The proportion of Palestinian's cropland that is irrigated has dropped from 27 percent in the mid-1960's to between 3.5 percent and 6 percent currently. Because of the declining profitability of agriculture, the loss of cultivated land to settlements, and an increasingly saline water supply, a large segment of the Palestinian population has abandoned agriculture. Many Palestinians have turned to unskilled day labor inside the Green Line, while others are unemployed.

Conflict: West Bank

The economic hardships incurred by the Palestinians has augmented grievances against the state of Israel, and contributed to the Intafadah uprising. Currently, water scarcity continues to generate economic decline for West Bank Palestinians, which in turn threatens to undermine the peace process as well as the transition to limited autonomy.

Mauritania - Senegal

Summary

A combination of persistent drought, soil degradation induced by unsustainable agricultural practices, and a rising population, fostered resource shortages in the Senegal-Mauritania region during the 1970's. The inability to satisfy the food demand for both black Africans residing in the Senegal River Valley and Arabic Moors living in Northern Mauritania, motivated the region's governments to build a series of dams along the Senegal river. The dams were completed in 1988.

Encouraged by the prospects of more productive agriculture and higher property values, the Northern Moors migrated south during the mid-1980's. Mauritanian black Africans claim that with the assistance of the Mauritanian government, the Northern Moors systematically expropriated land previously owned by them. This perceived expropriation deepened historically entrenched ethnic cleavages between black Africans and Moors in the Senegal-Mauritania region, and prompted attacks and counter-attacks between the two ethnicities in both countries. Regional stability was also threatened when tensions climaxed in a standoff between the two nations.

Environmental Factors

Recurrent droughts combined with one key human-induced environmental pressure to create agricultural land scarcity and food shortages: soil degradation. A 1982 UN study concluded that both Mauritania and Senegal could not support their projected populations without a large increase in agricultural productivity.

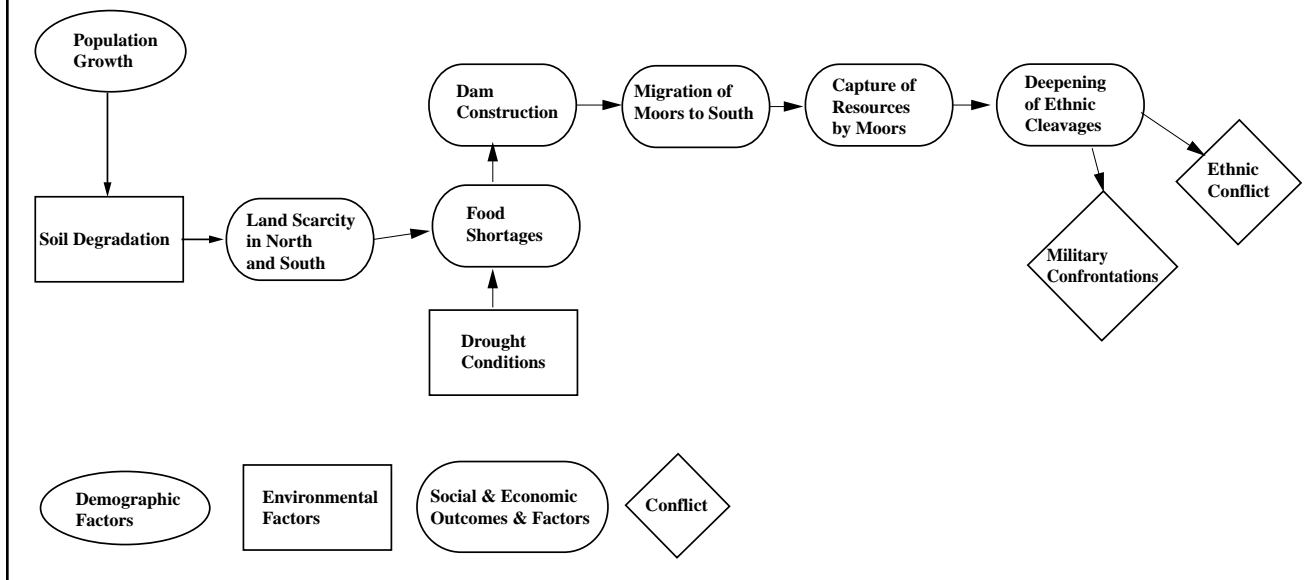
Soil Degradation has been induced by wind erosion, loss of nutrients, salinization due to over-irrigation, and soil compaction caused by the intensification of agriculture.

Social Effects of Environmental Conditions

As a direct result of the land scarcity and inability to meet the food demand, the governments of both Senegal and Mauritania sought and received international finance to build a series of dams along the Senegal river. The dams were designed to regulate the river's flow to produce hydro power and expand irrigated agriculture.

By the mid-1980's, competition for the land and its enhanced productivity escalated. Moors began to migrate from drought-stricken Northern Mauritania. Simultaneously, Mauritanian black Africans allege that the Moor-dominated Mauritanian government facilitated the expropriation of their property by abolishing the traditional landholding system. They further claim that black African farmers were denied any legitimate recourse to protect their lands from seizure and were forcibly expelled from the country.

Flow Chart of Environmental Conflict for Mauritania and Senegal Case Study



Conflict: Mauritania and Senegal

The perceived harsh treatment incurred by Mauritanian black Africans at the hands of the Mauritanian government conjured historically-rooted memories of enslavement and economic domination of black Africans by Moors. Due to the close ties of black African Senegalese to their Mauritanian counterparts, they rallied behind the cause of their fellow Mauritians, once again bringing to the surface an historic ethnic divide between southern ethnic groups and Moors.

A series of attacks and counter-attacks ensued in April of 1989. Across the nation bands of youths violated the homes and businesses of Moors, destroying and/or looting almost every one of the 17,000 Moor-owned shops in Senegal. At least 35 Moors were killed in Senegal, and between 15,000 and 20,000 had to be safeguarded under military protection. Rioters in Mauritania, in turn, killed 200 black Africans over a period of several days.

The ethnic clashes strained relations between the two nations. After severing diplomatic ties with each other, military confrontations ensued. The two countries exchanged rounds of artillery across the border on numerous occasions.

Although ethnic clashes have subsided and official diplomatic ties were restored in 1992, tensions stemming from the episodes continue to hamper both intranational and international relations to the present date.

Israel - Palestine (Gaza)

Summary

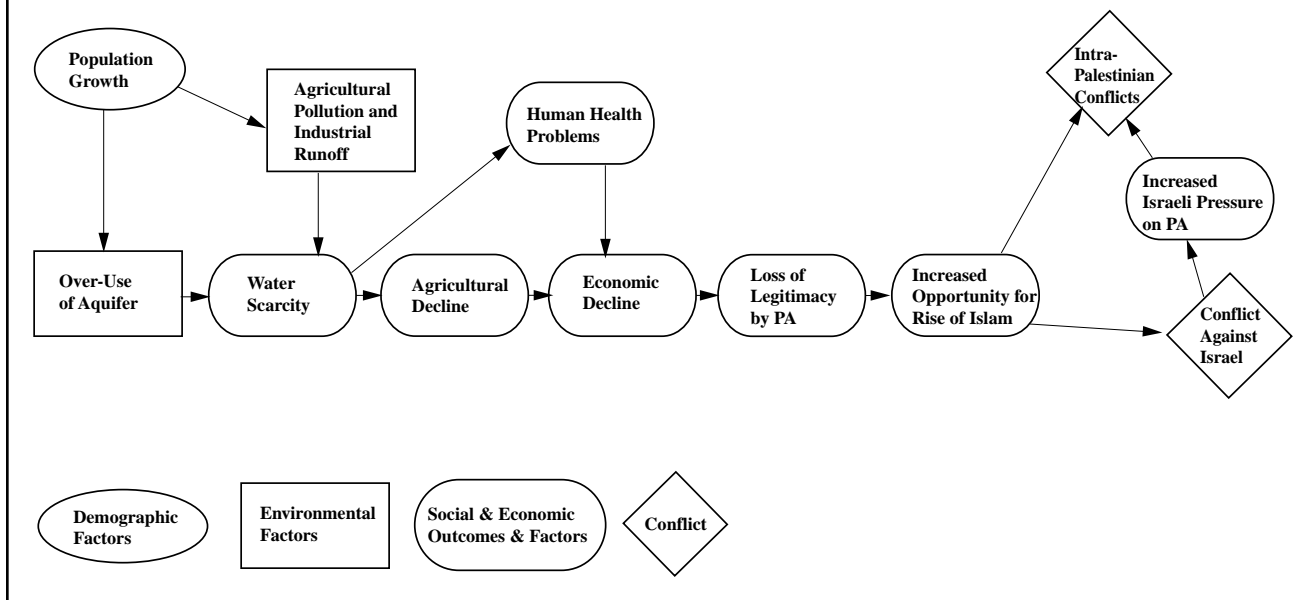
The achievement of limited autonomy for Palestinians in the Gaza Strip has not been followed by the peace and stability that many had hoped would follow. The Palestinian Authority (PA), led by Palestine Liberation Organization (PLO) leader Yasser Arafat, has faced political opposition from Islamic groups — who have also unleashed a series of attacks on Israel.

Environmental factors have played a causal role in both the intra-Palestinian violence and the Palestinian-Israeli violence. Due in part to a chronic shortage of usable water, the Gazan economy has declined significantly. Economic decline has challenged the legitimacy of the PLO, and given an opportunity for the support of Islamic groups such as Hamas. The chronic shortage of usable water is due to a number of factors including: an uneven division of water resources in favor of Israel; “natural” ecological conditions such as low precipitation; overuse of the one freshwater aquifer in Gazan territory; and pollution of much of the available water supply from both industrial and agricultural runoff.

Environmental Factors

One key environmental factor has combined with an already arid climate and an uneven distri-

Flow Chart of Environmental Conflict for Israel (Gaza) Case Study



bution of water resources to produce severe water scarcity in Gaza: agricultural contamination.

Agricultural Contamination. As a result of population growth in Gaza, water supplies are no longer sustainable: water use by Gazan Palestinians ranges from 100 to 140 m³ a year, whereas the sustainable supply is around 65 m³ a year. Taxation of the aquifer (combined with the proximity of the aquifer to the surface as well as its proximity to another saline aquifer), has led to falling water tables, which in turn has allowed for saltwater intrusion from the Mediterranean. Some experts predict that total salinization of the aquifer will occur in the near future.

The proximity of the aquifer to the surface also renders it vulnerable to agricultural and industrial runoff which pollutes the aquifer. Often unregulated use of pesticides, herbicides, and fertilizers, as well as leachate from industrial waste and biological contaminants from sewage, have rendered much of Gaza’s water supply unfit for human consumption and agricultural use.

Social Effects of Environmental Conditions

A corollary to the scarcity of water resources and contamination of available supply, has been both agricultural decline and human health problems for Gazans. These effects have combined with

an already highly indigent economy and have led to further economic decline in Gaza.

Agricultural GDP has declined nearly 20 percent in the last decade. Within the agricultural sector, farmers have been forced to turn to salt-tolerant crops and permeable soil. As a result, Gazan farmers have replaced citrus production with vegetable production — a far less profitable venture. Health effects emanating from the human consumption of contaminated water are pronounced. Water contamination in Gaza has been linked to infant mortality, infectious disease, and hypertension.

Agricultural decline and human health problems have exacerbated economic decline in Gaza. Unemployment in Gaza is estimated at 60 percent, and many workers have been forced to depend on wage labor from Israeli jobs which are vulnerable to border closures.

Conflict: Gaza

A rapidly declining economy has combined with a widespread sentiment among Gazan Palestinians that Yasser Arafat sacrificed too much in the deal for limited autonomy. These factors have generated a perceived reduction in the legitimacy of the PLO and the PA, which has extended the opportunity for Islamic organizations to fill the void. The Islamic group Hamas, in particular, has responded to the economic plight of the

Palestinians, thus augmenting their popularity. Hamas have used the increased support to further legitimize their attacks on Israel as well as to legitimize their opposition to the PLO/PA. Tensions between the PA and Islamics came to a head in November 1994, when sixteen people died and two hundred were wounded in an eruption of hostilities between the official police force and supporters of Hamas and Islamic Jihad. In August 1995, a thousand protesters confronted Palestinian police who were trying to arrest a suspected Hamas leader. Hamas has also launched a number of suicide raids on Israel, which in turn has provoked retaliations.

General Conclusions

This report has highlighted a disturbing trend in the international system: increasingly, international and intranational conflict appears to be linked to deteriorating environmental conditions and resources. This linkage reflects deteriorating environmental conditions worldwide, but recognition of the linkage is due in large part to a post-Cold War shift in discourse at the international level; a shift away from traditional “high politics” issues of war between major powers, to “low politics” issues such as poverty, population growth and environmental degradation.

The report demonstrates that the nexus between the environment and conflict is not always straightforward. Most often, environmental factors are enmeshed in a complex web of social, economic and political factors that function together to engender conflict. Nevertheless, if it is by understanding the nature and causes of conflict that we will enable the fabrication of solutions, then both the theoretical and empirical evidence contained in this report suggest that environmental conditions and resources should be a focal point for conflict resolution and conflict prevention at both the international and national levels.

The typology presented in the Overview was devised in order to facilitate this resolution and prevention of environmentally-related conflicts. This typology provides policy-makers and researchers with a concise guide to the fields of “environment and conflict” and “environmental security”, and allows them to better situate the literature within these increasingly complex fields. Familiarization with the literature and issues should allow policy-makers and researchers to engage in a more informed and fruitful discourse of these issue-areas, which, in turn, should facilitate efforts of conflict resolution and prevention.

Moreover, by arranging the empirical evidence according to the break-down indicated by the

typology, policy-makers and researchers will be better positioned to identify patterns in the linkages between environmental conditions and the outbreak of conflict. And by continuing to add case studies to the data collection, these patterns should increasingly come into sharper relief, thereby facilitating the resolution and prevention of environmental conflicts. While it is not the intention of this report to engage in an analysis of these patterns, some trends are immediately discernible:

- Conflicts over water resources are the most likely source of “direct international” environmental conflict. In particular, water flow, diversion, saliniation, flooding, and pollution are the most common environmental elements around which conflict over water resources erupt.
- The most common environmental factors that lead to both “indirect international” and “indirect intranational” conflicts are deforestation, soil erosion, desertification, flooding, and pollution. These environmental factors, in turn, combine with population growth and an uneven distribution of resources to engender and interact with a series of social effects, the most common of which are poverty, relative deprivation, migration, shifts in political power, and state failure or loss of state legitimacy.
- From the empirical evidence across all categories, it appears that the vast majority of environmentally-related conflicts occur within and between developing nations.

Each of these trends points to avenues for conflict resolution and prevention. The first two trends, for example, suggest that certain environmental factors require prioritized attention if conflict is to be countered. The transboundary nature of many of these environmental factors places the emphasis for the mitigation of environmental degradation on international institutions such as

the United Nations. Stewardship of these environmental factors, however, requires efforts by governmental and non-governmental bodies at both national and local levels.

The third trend, indicated above, suggests that while environmental conditions in the “developing world” are not necessarily inferior to those of the “developed world”, the level of “technical ingenuity” required to overcome deteriorating environmental conditions is often inadequate.³¹ The level of “technical ingenuity” in a society refers to its capacity to systematically marshal scientific and social solutions to societal quandaries. Efforts at conflict resolution and prevention, therefore, should be directed not only at improving environmental conditions, but also should be aimed at heightening the level of “technical ingenuity” required to mitigate environmental degradation. A high level of “technical ingenuity”, however, is no call for complacency. Recent depletion of fish stocks in the “developed world”, and the subsequent ascension of international tensions arising from this scarcity (e.g. witness the tensions between Canada and Spain over Atlantic Ocean fisheries resources in the 1990s), indicate that even societies with high levels of “technical ingenuity” are subject to environmentally-related conflicts. The most direct mitigation of such conflicts, therefore, can only come from efforts at “sustainable development” and proper stewardship of key environmental resources.

There is evidence to suggest that the relationship between the environment and conflict, and more generally between the environment and security, is beginning to garner attention at both the international and national levels. At the international level, for example, the North Atlantic Treaty Organization (NATO) recently conducted a major symposium on these related issue-areas. At the national level, the United States Department of Defense created a new position in 1993, entitled the Deputy Under Secretary for Environmental Security.

It is the intention of this report to not only develop systematic efforts at analyzing environmental conflicts, but more fundamentally to spur interest in this area. As it becomes increasingly clear that environmental issues have moved from the realm of “low” to “high politics”, it is simultaneously becoming evident that enhancement of environmental conditions and resources may hold the key to future peace.

Annotations

¹ Kaplan, 1994.

² “Conflict” is meant to refer to disputes that cause significant property damage and/or human injury and/or the loss of human life.

³ Brown, 1977.

⁴ For examples of the pessimist/neo-Malthusian position, see Erlich, 1968; Meadows et. al., 1972; Erlich and Erlich, 1990. For examples of the optimist/neo-classical economist position, see Cole et. al., 1973; Simon, 1981; Bailey, 1995.

⁵ Dabelko and Simmons, 1996 (cited with permission from the authors).

⁶ Proponents of redefining security include Brown, 1977; Ullman, 1983; Westing, 1986; WCED, 1987; Mathews, 1989; Renner, 1989; Brown, 1989; Myers, 1989, 1993; Gore, 1990, 1992; Porter, 1990, 1992; and Pirages, 1991, 1995.

⁷ Opponents of redefining security include Deudney, 1990, 1991; Walt, 1991; Conca, 1994; Dalby, 1992; Lipschutz, 1995; and Levy 1995a, 1995b. For more complete reviews of this debate see, Geoffrey Dabelko and David Dabelko, “Environmental Security: Demystifying the Concept, Clarifying the Stakes”, both in Simmons, 1995.

⁸ The idea for this category comes from Dabelko and Simmons, “Environment and Security” (cited with permission from the authors).

⁹ Proponents include Butts, 1993, 1994; Fleishman, 1995; and Dreyfuss, 1995.

¹⁰ Opponents include Deudney, 1990, 1991, 1992; Finger, 1991; Conca, 1994; Kakonen, 1994; Lipschutz, 1995; and Woever, 1995.

¹¹ These opponents include Finger, 1991, 1994; Pirages, 1991; Erlilch and Birks, 1990; Renner, 1991; and Westing, 1984, 1986, 1990.

¹² For example, see Choucri and North, 1974; Ullman, 1983; and Westing, 1986. For a detailed list

of the authors that recognize the link between environmental resources and the outbreak of international conflict, see Appendix 1 in Westing, 1986.

¹³ An important exception is Lipschutz, 1989, who argues that non-renewable resources have always been a secondary factor in the outbreak of international conflict.

¹⁴ It is somewhat debatable whether water should be considered a renewable or non-renewable resource, although the consensus appears to favor the former categorization. The distinction can cause some confusion; for example Westing, 1986, considers water to be “non-living” and therefore a non-renewable resource. For purposes of this report, however, water will be considered a renewable resource.

¹⁵ Proponents include Cooley, 1984; Westing, 1986; Gleick, 1992, 1993; Falkenmark, 1986; Starr, 1991; Myers, 1993; Postel, 1992; Ohlsson, 1992; and Swain, 1993. Opponents include Bershorner, 1992; and Homer-Dixon, 1995.

¹⁶ Gleick, 1998.

¹⁷ Proponents include Myers, 1993; Gleick, 1993; and Lowi, 1993a, 1993b.

¹⁸ Proponents include Mathews, 1989; Wirth, 1989; Gleick, 1989; Lipschutz and Holdren, 1990; Lonergan, 1991; Lund, 1991; Postel, 1992; Smil, 1992; Myers, 1993; Winnefeld and Morris, 1994; and Kaplan, 1994. Opponents include Homer-Dixon, 1991.

¹⁹ Pirages, 1996.

²⁰ Proponents include Ullman, 1983; Gurr, 1985; Timberlake and Tinker, 1985; Mathews, 1989; Libizewski, 1992; Boge, 1992; Kumar, 1993; Graeger and Smith, 1994; Winnefeld and Morris, 1994; Kaplan, 1994; Homer-Dixon, 1991, 1994, 1995, 1996; Renner, 1996; and Spillman, 1996. Opponents include Gee, 1994; Levy, 1995, 1996; and Goldstone, 1996, who advocates the “weak position.”

²¹ Bekure W. Semait, "Ecological Stress and Political Conflict in Africa: The Case of Ethiopia," p. 43 in Ornas and Salih, 1989. Note: Ornas and Salih (and Molvoer) are extremely careful to note that their findings do not indicate a strong cause and effect relationship between environmental stress and conflict. Only a situation of contemporaneity can be shown to exist; which has led the authors to offer conjectures of a cause and effect relationship.

²² Michael Stahl, "Environmental Degradation and Political Constraints in Ethiopia," p. 181 in Ornas and Salih, 1989.

²³ McClintock, 1984.

²⁴ Ibid.

²⁵ John Markakis, "The Ishaq-Ogaden Dispute," p. 158 in Ornas and Salih, 1989.

²⁶ Ibid., p. 160.

²⁷ Ibid., p. 160.

²⁸ Cooley, 1984.

²⁹ Joyce R. Starr, "Water Wars," *Foreign Policy*, No. 82, Spring 1991, p. 24; Malin Falkenmark, "Middle-East Hydropolitics: Water Scarcity and Conflicts in the Middle East," *Ambio*, 18 (6), 1989, p. 350.

³⁰ Starr, "Water Wars," pp. 24-25.

³¹ Homer-Dixon, 1996.

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