Woodrow Wilson International Center for Scholars

USAID FROM THE AMERICAN PEOPLE

ENVIRONMENTAL CHANGE AND SECURITY PROGRAM

REPORT

ISSUE 11 2005

Population and Conflict: Exploring the Links

Nepal: Environmental Stress, Demographic Change, and the Maoists

Population-Environment Funding: A Place for the Demographic Case

U.S. Military: Environmental Security in the Gulf

Preview: Parks for Peace or Peace for Parks?

Reviews: New Publications

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ENVIRONMENTAL CHANGE AND SECURITY PROGRAM

Since 1994, the Environmental Change and Security Program (ECSP) has promoted dialogue on the connections among environmental, health, and population dynamics and their links to conflict, human insecurity, and foreign policy. ECSP brings international policymakers, practitioners, and scholars to Washington, D.C., to address the public and fellow experts.

The program distributes two annual journals, the *Environmental Change and Security Program Report* and the *China Environment Series*, to more than 7,000 people around the world. *ECSP News*, a monthly e-mail newsletter, links 3,000 subscribers to news, meeting summaries, and event announcements on the program's comprehensive website, www.wilsoncenter.org/ecsp. ECSP also publishes *Focus*, a series of papers on population, environment, and security (previously named *PECS News*), as well as original research and occasional reports.

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FOREWORD

GEOFFREY D. DABELKO

Editor

Environmental pathways to peace can emerge at the unlikeliest of times—even during conflict, when managing shared environmental resources can be an important lifeline connecting combatants cut off from other avenues for dialogue. In May, I attended a conference in Tehran designed to connect Iran to the world's environmental community. "Environment, Peace, and the Dialogue Among Civilizations and Cultures," sponsored by the UN Environment Programme (UNEP) and Iran's Department of Environment, built on then-President Mohammed Khatami's initiative to engage in dialogue across borders and civilizations.

Seven hundred guests from around the world listened to President Khatami's energetic opening speech, which called for new dialogues that would help build international trust and understanding. He tied environmental decline to growing poverty and injustice, while stressing that environmental cooperation can increase peace and stability.

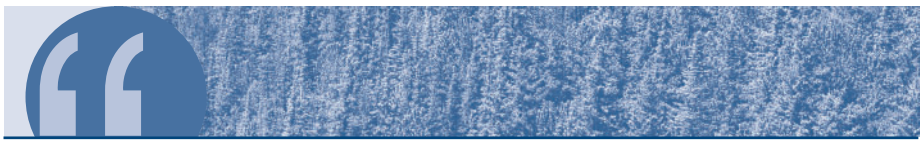
Approximately 70 politicians and experts from more than 30 countries, joined by at least as many Iranian attendees, debated topics such as environmental damage in wartime, scarcity's contributions to conflict, and cooperation as a peacebuilding tool. Using the environment as a pathway to peace was dissected in panel discussions—and practiced in the hallways among the international crowd of scholars and policymakers.

At its most fundamental level, environmental peacemaking uses cooperative efforts to manage environmental resources as a way to transform insecurities and create more peaceful relationships between parties in dispute. Environmental management may help overcome political tensions by promoting interaction, confidence building, and technical cooperation.

Even as we seek to turn the environment and security thesis on its head, ECSP continues its decade-long focus on conflict. The 11th issue of the *Environmental Change and Security Program Report* leads with a set of commentaries that explores links between population factors and conflict uncovered by recent research. We asked five scholars in the rapidly developing field of demographic security to distill their findings into brief articles on the role played by four key population dynamics: density, age structure, sex ratio, and ethnicity.

Nepal—the subject of this year's case study on environment, population, and conflict—might be a candidate for future environmental peacemaking efforts. Frequent contributor Richard Matthew and his collaborator Bishnu Raj Upreti analyze the underlying and often ignored forces contributing to Nepal's deadly Maoist insurgency. As in previous issues of *ECSP Report*—which examined key states including Brazil, Nigeria, and Ethiopia—the authors demonstrate that even though environmental and population factors are not the primary causes of instability, they are essential pieces of the puzzle.

Despite the important connections between population and environment, integrated programs addressing this linkage are facing a critical juncture: foundations are moving their funds to other priorities. Robert Engelman of Population Action International argues that there is still a place for the demographic case. In a sweeping overview, he surveys the field from NGOs to academics to policymakers, and concludes, "We can improve lives by promoting with one strategy reproductive health, the



While environmental peacemaking efforts will never single-handedly resolve conflicts in the Middle East, they may be, according to Iran's former vice president for the environment, "the end of the beginning."

demographic transition, and environmental sustainability"—if donors step up to support it.

Environmental peacemaking can take myriad forms, two of which we present in this issue of *ECSP Report*. A preview of a forthcoming ECSP publication, "Parks for Peace or Peace for Parks," offers five perspectives on these intriguing transboundary programs that seek to build peace and meet conservation goals—at the same time. Using examples from South Asia, southern Africa, and South America, the excerpts are drawn from papers that delve deep into the debate and offer recommendations for those considering these appealing yet complex mechanisms.

The military may seem an unlikely venue for environmental peacemaking, but as Rear Admiral John Sigler USN (Ret.) explains, environmental security engagement—particularly disaster response—is a part of U.S. Central Command's efforts to promote regional stability and contribute to the ongoing process of conflict resolution. While the goals may swing from conservation to security, looking at these efforts side-by-side helps develop our understanding of environmental peacemaking—which we are continuing to do, as Ken Conca and I (with others) follow up on our 2002 book on the topic.

To learn more about ECSP's current and upcoming projects, visit our ever-expanding website, www.wilsoncenter.org/ecsp, where new features include video of many of our past meetings and a topical navigation tool, which sorts news, research, videos, and links according to your interests. Our redesigned monthly e-newsletter, *ECSP News*, delivers meeting summaries, program news, and event announcements straight to your inbox, as we continue to use new media to streamline our publications and improve our dissemination.

While environmental peacemaking efforts like the Iranian conference or the U.S. military's programs will never single-handedly resolve conflicts in the Middle East, they may be, according to Iran's former vice president for the environment, Massoumeh Ebtekar, "the end of the beginning." In many places, the environment and natural resources are contributing to conflict and insecurity, whether from scarcity or abundance. But practitioners and policymakers should try to utilize environmental pathways to peace rather than ignore this tool. For example, the recently signed Senator Paul Simon Water for the Poor Act recommends expanding U.S. programs that support and encourage cooperative water management mechanisms around the world, as they are "critical components of long-term United States national security." Without such systematic efforts to capitalize on these peacemaking opportunities (and better analysis of existing programs), states and societies may deny themselves a valuable tactic—and a lasting peace.

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COMMENTARY

Population and Conflict: Exploring the Links

Geoffrey D. Dabelko is director of the Environmental Change and Security Program at the Woodrow Wilson International Center for Scholars.

GEOFFREY D. DABELKO

Scholars and policymakers alike focus most of their attention on proximate sources of violent conflict, giving short shrift to underlying, obscured, or complex causes. The Environmental Change and Security Program has historically offered a place for debating less prominent explanations and for examining conflict's causal roots. We continue that tradition with these commentaries on links between population dynamics and conflict.

Those seeking to understand war or population need to know: what role do population dynamics play in spurring, supporting, or explaining conflicts? The connection is not simple, however; a wide range of demographic relationships work in concert with a host of other factors, including the economy, the environment, and governance. But if we understand these relationships better, we may be able to defuse some population issues before they inflict more collateral damage in the world's conflicts.

ECSP Report asked five scholars to contribute commentaries summarizing their current research on the links between conflict and four key factors: density, age structure, sex ratio, and differential population growth. These commentaries, which seek to help non-experts navigate this complex territory, offer recommendations for policymakers and programmers working to prevent conflict and stabilize population growth.

Henrik Urdal, who co-edited the July 2005 *Journal of Peace Research* issue devoted to the demography of conflict, presents his research's surprising conclusion: at the national level, population growth, land scarcity, and urbanization do not have a great influence on patterns of war and peace, with a few exceptions.[1] He encourages further research to explore the exceptions he found and suggests that subnational data might reveal the effects of local population pressure on conflict.

The CIA's National Intelligence Council (NIC) recently cited "youth bulge"—a large percentage of youth in a population—as one ingredient in a "perfect storm for internal conflict in certain regions." While the connection between youth and conflict is commonly accepted, **Sarah Staveteig** finds a more subtle measure of age structure can effectively predict insurgent-based civil wars. By studying the future relative cohort size—the difference in the number of young adults versus the number of older working adults—policymakers could develop policies to reduce the chances of such conflicts.

The NIC's report also expressed concern about the destabilizing effects of the pervasive "son preference" in Asian countries—notably China and India—that has produced a shortfall of an estimated 90 million women. **Valerie Hudson** and **Andrea den Boer** summarize their groundbreaking research into this troubling phenomenon and its impact on the likelihood of conflict. They warn policymakers that

gender imbalances will affect the democratic potential of these countries: "In many ways, a society's prospects for democracy and peace are diminished in step with the devaluation of daughters."

Ethnicity carries much of the popular blame for recent conflicts, a point echoed by the NIC. But little sustained research has explored how demographic shifts contribute to violence. **Monica Duffy Toft** explores why differential population growth has not garnered the scholarly attention it deserves, and warns that without government and academic efforts to improve the reliability and availability of data on these shifts, aid and intervention strategies may continue to be counterproductive or destructive.

Notes

1. In 2005, two special issues of academic journals—the *Journal of Peace Research (JPR)* and the *European Journal of Population*—focused on the demography of conflict and violence (see Christian Leuprecht's review of the *JPR* issue in this *Report*). Emerging from a workshop organized by the Working Group on the Demography of Conflict and Violence under the International Union for the Scientific Study of Population (IUSSP), these journal issues reflect the width and breadth of the demographic causes and consequences of violence—genocide, economic inequality, war mortality, and migration, among others. In addition to editing the *JPR* issue, Henrik Urdal contributed an article to *JPR*, "People vs. Malthus: Population Pressure, Environmental Degradation, and Armed Conflict Revisited," on which he based his commentary in this *Report.*

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Defusing the Population Bomb: Is Security a Rationale for Reducing Global Population Growth?

HENRIK URDAL

Introduction

Demographic and environmental factors have claimed a dominant position in post-Cold War security discourse. According to neo-Malthusians,[1] rapid population growth will lead to per capita scarcity of natural resources such as cropland, freshwater, forests, and fisheries, increasing the risk of violent conflict over scarce resources. In contrast, resource-optimists[2] claim that scarcity of agricultural land, caused by high population density, may drive technological innovation, which could lead to economic development and thus build peace over the long term. Although world population growth is projected to eventually level out, some areas and countries will experience relatively high growth rates for decades to come (Lutz et al., 2004). If these areas are seriously threatened by instability and violent conflict, reducing population growth could be an important concern for the international community.

Building on my recently published empirical analysis of the relationships between population pressure on natural renewable resources and the outbreak of domestic armed conflict,[3] this policy brief examines whether high population pressure is a general, persistent threat to domestic peace over time, and thus deserves the attention of security policymakers. While many empirical studies examine single cases with limited potential for generalization and prediction, this global, cross-country statistical model, which covers a 50-year period, assesses the relationships among several different indicators of population pressure and domestic armed conflict (involving at least 25 battle-related deaths in a year). Prior to this study, little empirical research has systematically examined the role of population pressure in causing domestic armed conflict.[4]

My analysis found that population growth, land scarcity, and urbanization do not greatly influence patterns of war and peace (see Table 1 for a summary). The national-level relationship between population-induced scarcity and conflict identified by several case studies does not seem to represent a strong general trend among countries over time. However, there were a few exceptions: countries experiencing high population growth and density in the 1970s were indeed more likely to suffer an outbreak of domestic armed conflict. In addition, further research may moderate these findings: for example, using local level data—rather than national—might reveal a stronger relationship between population pressure and conflict.

Moderate Neo-Malthusians

Few scholars would argue that resource scarcities never occur or that they are irrelevant to conflict. Natural resources essential to human life and welfare are unevenly distributed between and within states, and local scarcities of certain natural resources may arise and persist, at least temporarily. According to Thomas Homer-Dixon and his Project on Environment, Population, and Security at the University of Toronto—the most influential neo-Malthusian school—population growth is an important

Henrik Urdal is a doctoral candidate and research fellow at the Centre for the Study of Civil War at the International Peace Research Institute, Oslo (PRIO) in Norway.

According to my results, high population growth—by itself—is not associated with armed conflict. In addition, scarcity of productive land is associated with less conflict, contrary to neo-Malthusian expectations.

source of demand-induced scarcity: if a resource base is constant, the availability of resources per person will diminish as an increasing number of persons share it, or as demand per capita rises (Homer-Dixon, 1999, page 48).[5]

Neo-Malthusians are primarily concerned with resources that are essential to food production. Homer-Dixon and Blitt (1998) argue that large populations in many developing countries are highly dependent on four key resources: freshwater, cropland, forests, and fisheries. The availability of these resources determines people's day-to-day well-being, and scarcity of such resources can, under certain conditions, cause violent conflict. Some propose that the resource scarcity and conflict scenario is more pertinent to developing countries due to their lower capacity to address environmental issues and to cope with scarcity (Homer-Dixon, 1999, pages 4–5; Kahl, 2002, page 258). Unlike some strict Malthusians, Homer-Dixon claims that population pressures do not increase the risk of conflict in isolation, but they could in combination with environmental degradation and uneven wealth distribution.

More recent contributions further moderate the neo-Malthusian position. Colin Kahl (2002) criticizes much neo-Malthusian writing for failing to identify the most important intervening variables. While state weakness is often cited as a necessary condition for environment-related conflict, Kahl argues that conflict may also arise under conditions of "state exploitation," when powerful elites exploit rising scarcities and corresponding grievances in order to consolidate power (page 265). Richard Matthew (2002, page 243) criticizes the simple neo-Malthusian thesis for understating the adaptive capacity of many societies and for not adequately addressing the historical and structural dimensions of violence, such as globalization and colonial influence.

An Empirical Analysis of Neo-Malthusian Claims

If the basic neo-Malthusian scheme is correct, the risk of armed conflict for countries experiencing high levels of population pressure should be greater, all other factors being equal. This article investigates the likelihood that the following forms of population pressure affect the risk of armed conflict:

- Population growth;
- Population density relative to productive land area;
- Continued population growth when productive land is already scarce; and
- Urbanization.

My study encompasses statistical surveys of all sovereign states in the international system and all politically dependent areas (colonies, occupied territories, and dependencies) for the 1950–2000 period, including data on domestic armed conflict[6] drawn from the PRIO–Uppsala dataset (Gleditsch et al., 2002), and data on population growth and size, urbanization, and scarcity of productive land from the United Nations and other sources.[7] Since economic and political conditions may influence both demography and conflict, potentially confounding the relationships of interest, I used multivariate modeling. The study controls for poverty, governance, size of the country, economic growth, and length of time since the end of a previous conflict.[8] The population data I used are assumed to be among the most reliable and comparable available. However, data on

Table 1: Population and Risk of Conflict Summary

	Basic Model	Expanded Model	1970s	Post-Cold War
Population growth	Not significant	Not significant	Not significant	Not significant
Population density	Lower risk (weak)	Not significant	Not significant	Not significant
Growth*density	Not significant	Not significant	Higher risk (medium)	Not significant
Urban growth		Not significant		Lower risk (medium)

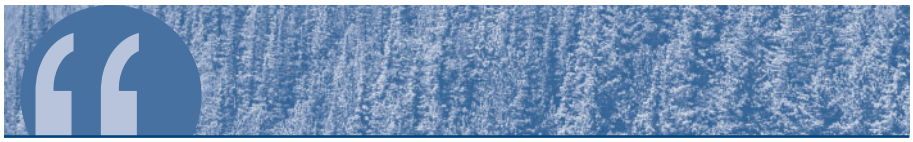
Note: This chart summarizes the direction and statistical significance (in parentheses) of the association between the main explanatory variables and the risk of conflict. For the actual values, please see Table 2.

international migration flows are generally inadequate, and for many less developed countries and regions where population data are inferior or less available, the UN Population Division employs demographic techniques to arrive at reasonable estimates (UN, 2000).[9] Since the data are aggregated at the national level, the results do not reflect differences between regions of individual countries.

According to my results (see Table 2), high population growth—by itself—is not associated with armed conflict. In addition, scarcity of productive land is associated with less conflict, contrary to neo-Malthusian expectations. This is not a strong and robust statistical relationship, suggesting that population density is not an important predictor of peace *or* of war.[10] Land scarcity combined with continued high population growth is positively associated with conflict, but for the most part this relationship is neither strong nor robust, indicating that conflict is not more likely to break out in countries presumably experiencing "Malthusian traps." Under certain specifications, however, the relationship turns significant.[11]

Furthermore, poor countries experiencing high levels of population pressure are not more susceptible to armed conflict, which counters the proposition that developing countries are more vulnerable to violence generated by population pressure and resource scarcity. Urbanization does not appear to be a risk factor, and the interaction between urbanization and economic growth was not statistically significant, failing to lend empirical support to the theory that high urban growth rates may lead to violence when combined with economic crises.

Interestingly, the neo-Malthusian conflict scenario *was* supported when I considered the post-World War II decades separately. In the 1970s, countries experiencing high population growth and density were indeed more likely to see the outbreak of a domestic armed conflict. (This relationship is quite robust, but it disappears when the sample is restricted to sovereign states.) The rise of environmental security literature in this decade could reflect the greater significance of neo-Malthusian factors in this period. From 1965–80, less developed regions experienced their highest levels of population growth since World War II, particularly in parts of Asia where population density was already high. During this time, the superpowers were heavily involved in armed conflicts around the globe (Harbom & Wallensteen, 2005). The attention garnered by demographic and environmental changes may have influenced the superpowers' choice of military engagements.



The national-level relationship between population-induced scarcity and conflict identified by several case studies does not seem to represent a strong general trend among countries over time.

In the post-Cold War era, by contrast, there is no support for neo-Malthusian claims; instead, high rates of urbanization correlate with *less* conflict.

Policy Recommendations and Future Research

According to basic neo-Malthusian theory, societies experiencing scarcity related to population growth should have a greater risk of domestic armed conflict. My empirical test does not render much support for this scenario, nor for the optimistic perspective. Factors like population growth, land scarcity, and urbanization simply do not appear to greatly influence patterns of war and peace.

Claims that the world has entered a "new age of insecurity" since the end of the Cold War appear to be unfounded (see de Soysa, 2002a, page 3). Rather, the post-Cold War era is notable for the strong statistical significance of conventional explanations of conflict, such as level of development and regime type. Although often portrayed as an emerging challenge to security, countries with high levels of urban growth were significantly less prone to armed conflict during this period. While Population Action International's report, *The Security Demographic* (Cincotta et al., 2003), finds a bivariate relationship between high levels of urbanization and conflict, I find that this relationship disappears when controlling for important and relevant variables such as the level of development.[12]

According to my results, using security as a rationale for reducing global population growth is unwarranted. It may even be counterproductive, potentially overshadowing more important rationales for reducing population growth. These may include human—rather than conventional—security issues like sustainable development; economic performance; and female education, empowerment, and reproductive health.

But the potential for further research is substantial, especially for exploring the relationships between population and other factors. For example, in related analyses, de Soysa (2002a, 2002b) finds that population density is positively associated with armed conflict when controlling for the level of international trade. Potentially, when a country trades fewer goods, land scarcity is more pertinent and may instigate armed conflict. Thus, a bad macroeconomic environment may exacerbate the relationship between armed conflict and scarcity of productive land.

The aggregated, national-level data I used to test the population pressure hypotheses may fail to reflect the effects of *local* population pressure, which presents important challenges for future research.[13] My study indicates that the national-level relationship between population-induced scarcity and conflict identified by several case studies does not seem to represent a strong general trend among countries over time. Geographically organized data and statistical tools could assess whether scale may account for the absence of empirical support for the neo-Malthusian paradigm. Studying subnational data from arguably vulnerable countries might reveal the possibly conflict-conducive effects of local population pressures.

Finally, researchers should more thoroughly assess the often-neglected relationship between migration—both international and domestic—and conflict. This study, which incorporated a very crude measure of large refugee populations, did not support the claim that such pop-

Table 2: Population and Risk of Armed Conflict

	Model 1 Basic *ß* *st. error*	**Model 2 Expanded** *ß* *st. error*	**Model 3 1970s** *ß* *st. error*	**Model 4 Post-Cold War** *ß* *st. error*
MAIN EXPLANATORY VARIABLES				
Population growth	-0.009 (0.062)	-0.013 (0.071)	-0.024 (0.099)	-0.126 (0.086)
Population density	-0.088* (0.053)	-0.068 (0.060)	-0.080 (0.115)	0.064 (0.106)
Growth*density	0.042 (0.039)	0.014 (0.045)	0.129** (0.057)	0.040 (0.075)
Urban growth		-0.025 (0.041)		-0.112** (0.046)
CONTROL VARIABLES				
Country size (total population)	0.269*** (0.047)	0.289*** (0.055)	0.344*** (0.103)	0.228** (0.106)
Development (infant mortality rate)	0.006*** (0.001)	0.010*** (0.002)	0.011*** (0.003)	0.021*** (0.005)
Democracy	0.006 (0.014)	0.015 (0.015)	0.028 (0.029)	0.0001 (0.027)
Democracy, squared	-0.014*** (0.003)	-0.014*** (0.003)	-0.005 (0.007)	0.022*** (0.006)
Economic growth		-0.054** (0.024)		
Time since last conflict	1.819*** (0.275)	1.691*** (0.304)	1.101 (0.714)	1.716*** (0.467)
Constant	-6.078*** (0.488)	-6.302*** (0.599)	-7.433*** (1.143)	-5.691*** (1.087)
N Log likelihood Pseudo R^2	7,752 -793.33 0.107	5,851 -631.85 0.113	1,519 -165.94 0.103	1,680 -194.43 0.197
Asterisks signify the level of statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.				

Note: Not all results are displayed in this table; for all results, see Urdal (2005).

ulations represent a security threat. However, more empirical work in this area may shed important light on this central aspect of neo-Malthusian theory.

In the 1970s, countries experiencing high population growth and density were indeed more likely to see the outbreak of a domestic armed conflict.

Notes

1. Thomas Malthus (1803/1992) asserted that food production would grow arithmetically, while human population would grow exponentially—which, at some point, would cause serious food shortages and human misery. At the end of the 1960s and the beginning of the 1970s, a wave of neo-Malthusian literature predicted that the rapidly growing world population would soon exceed the resource base and lead to serious environmental destruction, widespread hunger, and violent conflicts. Neo-Malthusian concern over security became even more pronounced in the 1990s.

2. Also known as "cornucopians," resource-optimists believe that the world is continuously improving by both human and environmental standards. They offer three main challenges to the neo-Malthusian paradigm: first, they claim that most natural resources are not really scarce in a global context. Second, even if some resources are getting scarcer, humankind is able to adapt to these challenges. Third, they argue that *abundance* of valuable natural resources leads to violent conflict, not scarcity.

3. This policy brief is based on my article "People vs. Malthus: Population Pressure, Environmental Degradation, and Armed Conflict Revisited," published in the *Journal of Peace Research* in July 2005.

4. Studying shorter time series, Hauge and Ellingsen (2001) and de Soysa (2002b) find that high population density slightly increases the risk of domestic armed conflict and civil war. Collier and Hoeffler (1998) find no significant effects of population growth or density on civil war (defined as producing more than 1,000 battle-related deaths in a year). In bivariate models, Cincotta et al. (2003) find a relationship between high urbanization rates and the risk of civil armed conflict onset.

5. Gleditsch and Urdal (2002) provide a review of Homer-Dixon's work on population, environment, and conflict.

6. A domestic armed conflict is defined as a conflict confined to one country, fought between at least two organized parties of which at least one has to be a government, resulting in at least 25 battle-related deaths within a calendar year. Here, civil wars are defined as domestic armed conflicts with at least 1,000 battle-related deaths per calendar year.

7. Sources include the United Nations' *World Population Prospects* (1999), the UN's annual *Demographic Yearbook*, the *Statistical Abstract of the World* (Reddy, 1994), the *CIA World Factbook* (CIA, 2001), and the World Bank's *World Development Indicators* (2003). The data in the UN's *World Population Prospects* cover all states and political dependencies with more than 150,000 inhabitants.

8. For full references and data descriptions, see Urdal (2005).

9. The UN's population division uses a number of different sources to assess consistency. For some extreme cases, where information is outdated or non-existent, the UN derives estimates by inferring levels and trends from those experienced by countries in the same region with similar socio-economic profiles (UN, 2000).

10. These results are virtually unchanged when using a conventional density measure.

11. The relationship is statistically significant when the model requires a longer period of peace (five years or more) between hostilities to determine whether a conflict is "new." However, it becomes insignificant when the sample is restricted to sovereign states.

12. Since the level of development—which is assumed to capture aspects of poverty and state weakness—is also a strong predictor of conflict, we have to control for development to assess the effect of urbanization. Cincotta et al. (2003) are thus rightfully cautious not to draw strong conclusions from the statistical relationships they find. In my own model, I find a similar statistically significant bivariate relationship between urbanization and conflict outbreak, but this relationship disappears when controlling for level of development.

13. Similar criticism could also be directed at previous case study literature in the field, including Homer-Dixon and Blitt (1998).

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The Young and the Restless: Population Age Structure and Civil War

SARAH STAVETEIG

Three months after the attacks of September 11, 2001, the *New York Times* asked, "Is the Devil in the Demographics?" (Sciolino, 2001). The article examined the vulnerability of large cohorts of unemployed youth to extremist ideology and political recruitment, and speculated about the hazards created by future youth cohorts in the Middle East. In the post-9/11 era, however, there has been very little academic research on the relationship between youthful age structure and warfare (three notable exceptions: Urdal, 2002; Hammel & Smith, 2002; Cincotta et al., 2003). Literature on civil war and insurgency has instead highlighted the role of other causal factors such as the presence of valuable resources, the degree of ethnic fractionalization, and type of political regime, while downplaying the importance of population age structure (see, e.g., Collier & Hoeffler, 2001; Fearon & Laitin, 2003; Elbadawi & Sambanis, 2002).

While these factors likely play an important role in the onset of civil war,[1] the importance of youthful age structure—particularly in insurgency-based civil wars[2]—should not be ignored. The relationship between large youth cohorts and civil war appears to have held throughout history. For example, Herbert Moller (1968) suggests that wars in pre-modern and present-day Europe, including the rise of the Nazi party in Germany, corresponded with surges in the proportion of young men in the population. Yale historian Paul Kennedy (1993) argues that revolutions occur more often in countries with large populations of "energetic, frustrated, young men."[3] Even after controlling for the fact that more youthful countries are less developed and have more vulnerable political regimes, my research finds that a large difference in the number of young adults compared to the number of older adults—"relative cohort size"—can help predict civil war, particularly insurgent-based civil wars.

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"Excess Youth": A Perfect Storm?

Some recent conflicts appear to lend credence to the "excess youth" hypothesis. For example, Philip Gourevitch (1998) describes how Rwandan *génocidaires* were recruited from among the jobless young men who were "wasting in idleness and attendant resentments…Most of the men were motivated by the opportunity to drink, loot, murder, and enjoy higher living standards than they were previously accustomed to" (page 93). In Sierra Leone, where young people comprised 95 percent of the fighting forces in a recent civil war, an NGO official explained that the youth are "a long-neglected cohort; they lack jobs and training, and it is easy to convince them to join the fight" (Mastny, 2004, page 19). While recent conflicts in Palestine and the Democratic Republic of the Congo are mostly influenced by other factors, both areas have among the highest

ratios of young adults (15-29) to older working-age adults (30-54) anywhere in the world.

Even though population growth has slowed worldwide and will likely end within the next century (Lutz et al., 2004), high fertility rates in Africa and the Middle East will continue to bring increasingly larger cohorts of young adults for the next few decades. As Chart 1 illustrates, the ratio of young people to adults in the developing world will continue to remain well above the 1980 world peak for decades to come. The National Intelligence Council (2004) refers to these increasing youth cohorts as part of a "perfect storm"—including failed states, poor economies, and religious extremism—that will likely fuel conflict in certain parts of the world for decades to come.

"Youth Bulge" Is a Misnomer

I believe that the mixed evidence on youthful age structure and the risk of conflict is largely due to the poor measurement of age structure in most research. The term "youth bulge" is a misnomer: although few authors use the same definition of youth bulge, nearly all researchers[4] measure it as the number of young people (generally between ages 15 and 24) as a percentage of the adult population. A bulge, literally defined as an "irregular swelling" (Abate, 1998), should be visible in the young adult section of the age pyramid. Yet some so-called youth bulges, such as that in contemporary Iraq (Panel A of Chart 2), do not produce the bulge shape characteristic of baby booms followed by "baby busts" (Panel B of Chart 2).

Relative Cohort Size: A Better Measure of Age Structure

If not the bulge shape in and of itself, then why do youthful populations influence the risk of insurgency? I argue that the presence of young adults is not as important as the degree of alienation, frustration, and marginalization they experience. These factors are subjective and difficult to measure; one way might be to examine how much schools and the labor market must expand to accommodate the incoming cohort of teenagers. We can obtain a rough estimate by measuring the current group of young adults (ages 15 to 29) as a proportion of the number of older working adults (ages 30 to 54) to find a "relative cohort size," after a similar measure proposed by Richard Easterlin (1968, 1978, 1987).[5]

Relative cohort size can provide the missing link between the population of young men and the risk of civil war, especially if we consider only insurgency-based civil wars (Staveteig, 2004a, 2004b, 2005). Easterlin's relative cohort size hypothesis delineates the relationship between youthful populations and the economic and psychological frustrations that enable political instability and, ultimately, civil war. As a large relative cohort comes of age, the tension produced by lack of success in the job and marriage markets may, in the presence of other factors, render armed conflict a more appealing option. While relative cohort size is unlikely to be an immediate cause of civil war, large birth cohorts often strain the schooling system and labor market of a country, particularly a developing one, which can result in massive frustration, unemployment, reduced wages, and dissatisfaction—and arguably create a potential army of young men who could be easily recruited in a rebellion.[6] If economic opportunities exist and expand in tandem with the youthful population, as they did in most parts of East Asia, enormous economic growth can result from relatively large cohorts (Bloom & Williamson, 1997; Bloom, Canning, & Malaney, 1999). Yet in most developing countries, where economic opportunities are not even sufficient for current youth cohorts, a rise in the population entering the labor force is likely to increase joblessness.

In the United States, a large relative cohort size—such as that created by teenage baby boomers—is thought to have been one cause of the social upheaval of the late 1960s and early 1970s (Macunovich, 2002; Easterlin, 1987). In countries with less economic opportunity and fewer channels for enacting social change, large cohorts of young adults may choose more

Even after controlling for the fact that more youthful countries are less developed and have more vulnerable political regimes, my research finds that a large difference in the number of young adults compared to the number of older adults—"relative cohort size"—can help predict civil war, particularly insurgent-based civil wars.

violent means of protest and social change. Historical case studies have documented that a youthful age structure in Cyprus, Palestine, Algeria, and Laos increased the size of the population that could be mobilized, which in turn influenced the intensity of the conflicts (Choucri, 1974, page 191).

One of the most important explanations of the importance of relative cohort size is what Easterlin (1978, 1987) calls "relative male income," which is the standard of living a man's income can buy relative to his father's standard of living. Relative male income is inversely related to relative cohort size, other things being equal. In the United States, the baby boomers were a much larger birth cohort than their parents' cohort, so people born later in the boom experienced a much tighter entry-level job market than those born early or before the boom. In this way, one's birth and fortune were interlinked: members of smaller cohorts generally had an easier time finding jobs and education, while equally qualified members of larger cohorts struggled to achieve the same standard of living.

Not every society may respond the same way to low relative male income, but large birth cohorts in any country—particularly males—must be accommodated by the school system and eventually by the labor market. In populations with many women of child-bearing age, population momentum will cause overall population size to increase even decades after fertility declines. The government will be required to increase expenditures on services (such as roads, schools, and hospitals) to accommodate each new cohort. When the large birth cohort reaches adulthood, they will require more jobs than vacated by previous cohorts. In deeply religious contexts where pre-marital sex is forbidden and men are expected to financially establish themselves prior to marriage, such a shortage of economic opportunities can be particularly frustrating, as the shortage can prevent even educated adults from entering into marriage and achieving cultural notions of adulthood. Research on suicide bombers, for example, has shown that many are well-educated and highly capable, yet lack the economic opportunities necessary to establish themselves (Sprinzak, 2000; Pape, 2005)

Measuring the Importance of Relative Cohort Size

To test the importance of relative cohort size in the probability of civil war, I built a dataset that combined information on civil wars (Strand et al., 2004), insurgency-based civil wars (Heidelberg Institute for International Conflict Research, 1999), national per capita income (Heston et al., 2004), demographic factors (United Nations, 2003), political regime (Marshall et al., 2004), and other relevant trade and economic variables (World Bank, 2002). The data span 10 five-year periods from 1950–2000 in 174 countries.

In accordance with previous research, my baseline model found that countries with unconsolidated political regimes,[7] high infant mortality rates, lower per capita incomes, and larger population sizes consistently had a higher risk of civil war onset (Staveteig, 2005). Infant mortality rate (which is often used as a proxy to measure development) and per capita income were nearly equally strong predictors of civil war onset, and both measures were highly correlated to one

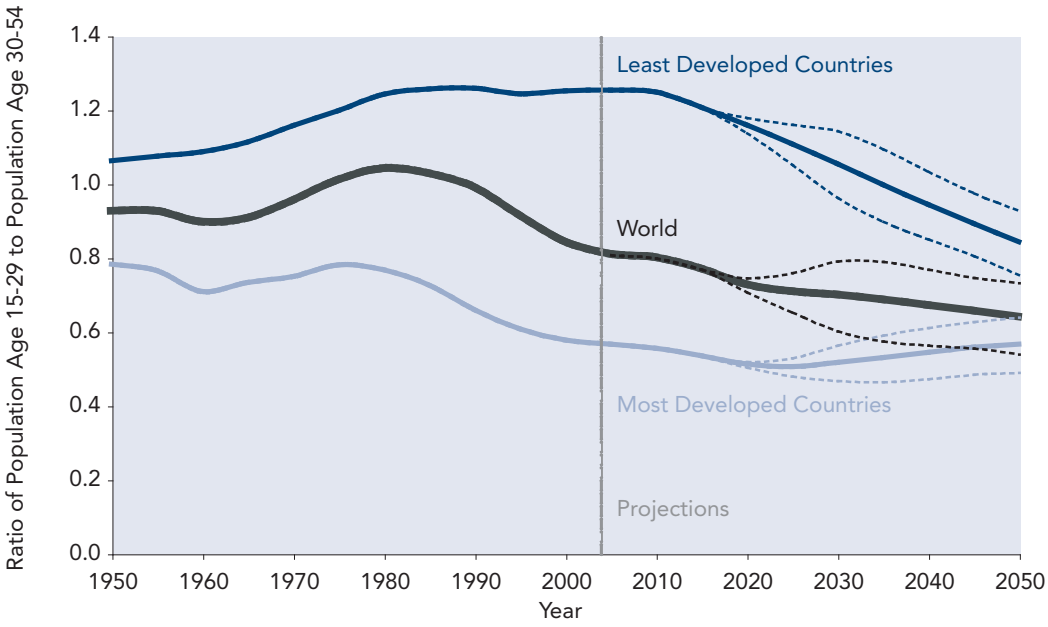
another. I ultimately chose to use only the infant mortality rate in my models because the data over time and country were more complete. None of the other factors that researchers suggested are important—urbanization, per capita income growth, secondary school enrollment, and population density—measurably improved the baseline model.

Calculating youth as a percentage of the entire population ("non-relative cohort size") did not determine the onset of civil wars (insurgency-based or otherwise). On the other hand, comparing a *specific* population of youth to a *specific* population of adults (relative cohort size) and comparing a *specific* population of youth to *all* adults ("quasi-relative cohort size") both strongly predicted the risk of civil war. While the average country in the dataset experienced a 12 percent chance of any kind of civil war erupting in any given five-year period, differences in relative cohort size could swing that risk as low as 6 percent and as high as 28 percent, holding all other factors equal.[8] For insurgency-based civil wars the results were even stronger. While the average country faced a 9 percent chance of an insurgency-based civil war starting in any given five-year period, relative cohort size could make this risk as low as 2 percent or as high as 38 percent. Higher levels of infant mortality and an unconsolidated political regime could greatly increase this risk.

Could these results be influenced by the countries' different levels of development? Using the United Nations' classification scheme for more-developed and least-developed countries,[9] I found that even within these broad development categories, differences in age structure were significant and measurable predictors of conflict.

Interestingly, it appears that *future* relative cohort size could also be used to predict conflict. Relative cohort size can be measured up to 10 years in advance using current data on population age structure. For example, the ratio of future young adults (e.g., the current 5- to 19-year-olds) to future older adults (the current 20- to 44-year-olds)—combined with current information about infant mortality, population size, and governance—can predict whether conflict will occur 10 to 15 years from now almost as well as waiting 10 years to measure the actual relative cohort size. This finding could help develop conflict-prevention policies; by identifying large relative cohorts up to 10 years before they reach young adulthood, policymakers and funders might devise better strategies for easing the transition, and thus reduce the chances of conflict.

Chart 1: Relative Cohort Size Wordwide 1950–2050

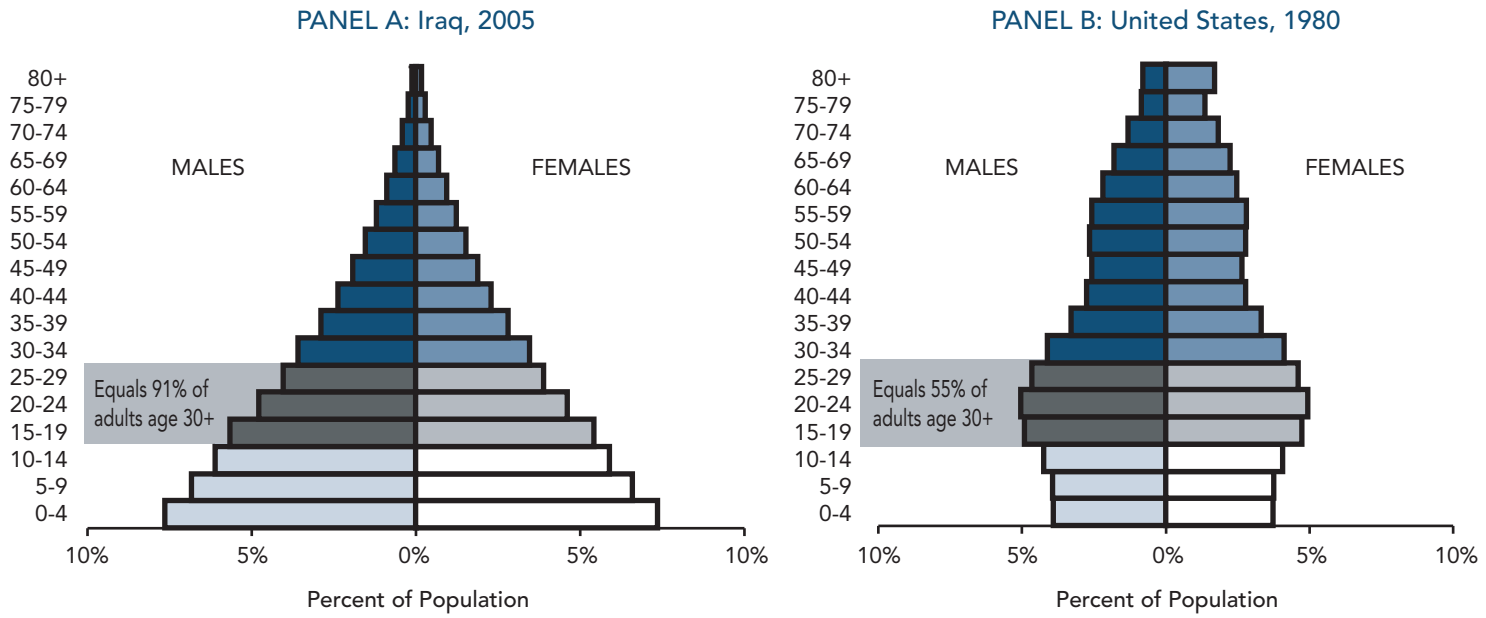


Note: "Relative Cohort Size" is defined as the ratio of population aged 15-29 to population aged 30-54.
Source: Author's calculations from United Nations' *World Prospects Data: The 2002 Revision* [CD-ROM].

Conclusion

Just as developed countries now face future pension shortfalls and other challenges associated with aging populations, less developed countries face the opposite problem: excess youth. In

Chart 2: Age Structure in Iraq 2005 and the United States 1980



Note: The term "youth bulge" is a misnomer: all contemporary definitions of the term would rank contemporary Iraq (Panel A) as having a larger youth bulge than the United States did in 1980 (Panel B), despite the fact that Panel B shows a more characteristic "bulge" shape.
Source: United Nations' *World Prospects Data: The 2002 Revision* [CD-Rom]. The 2005 estimate for Iraq is based on the medium-range projections from 2002.

2005, 1.9 billion people—nearly one-third of the world's population—are under the age of 15. Ninety percent of these youth live in less-developed countries.[10] Even if fertility decreases, large birth cohorts in developing countries are unlikely to wane for a few decades. As these large birth cohorts enter adulthood, the risk of insurgent civil wars increases. When relative cohort size peaked in the United States (as baby boomers entered young adulthood) in 1975, there was nearly a one-to-one ratio between the number of 15- to 29-year-olds and the number of 30- to 54-year-olds. In the average least-developed country, that ratio is expected to stay above one until 2035. The strain on school systems and labor markets in these countries will be profound. In absolute numbers, the increase in youth cohorts will be enormous.

Of course, it is not likely that a high relative cohort size will be *the* inciting cause of conflict in least-developed countries. A very youthful population is an important factor, among others, that flares up only under certain conditions or "sparks." But at the same time, sparks can only trigger violent conflicts when contextual factors enable them. If alternative means of social change are available, violence will be less appealing. A large relative cohort is not in and of itself a sufficient cause for civil war, but a smaller relative cohort size makes it more difficult for conflicts to erupt.[11] Even after controlling for the fact that more youthful countries are less developed and have more vulnerable political regimes, my research finds that relative cohort size is an important predictive factor for civil war, particularly insurgent-based civil wars.

The link I found between relative cohort size and civil war would have been even stronger if I had looked at the sub-national level, as insurgent groups often come from sub-populations with high relative cohort size (for example Chechens in Russia, Northern Irish in the United Kingdom, and Palestinians in Israel).[12] Recent suicide bombings in London and riots

in France are important reminders that developed countries are not immune to violent rebellions from youthful sub-populations. But these events alone do not justify restricting immigration; instead, I believe that they signal the urgent need to improve integration and equality. Industrialized countries facing major pension shortfalls due to a high ratio of retirees to workers could mitigate the problem by hiring young workers from the developing world. Even though immigration and integration are politically sensitive topics, developed countries should consider projected pension shortfalls and the cascading security risk of large youth cohorts in the developing world when debating immigration and integration policies.

Easing the transition of large birth cohorts into adulthood and developing viable nonviolent means of political change could help prevent civil war in countries where relative cohort size is expected to be high. Methods might include increasing the number of opportunities available for young people (perhaps by offering employers credits for hiring entry-level workers, expanding regional security forces, or using international aid to create an internal volunteer corps), expanding tertiary schooling options (if appropriate jobs will later be available), ensuring universal suffrage for young adults, and maintaining a fair and open political system.

A better understanding of contextual factors leading to civil war may improve our ability to prevent it in the future. Research on the causes of civil war should incorporate measures of relative cohort size. Unraveling the background factors that put a country at risk for conflict is arguably more important than finding the immediate "spark" of conflict, as policy is much better equipped to address structural problems than immediate factors. In many countries around the world, we cannot prevent large relative youth cohorts over the next two decades, but understanding the role of relative cohort size and planning wisely could help reduce the risk of future insurgency-based[13] civil wars.

Notes

1. I define a civil war as an "internal armed conflict" according to the Armed Conflict Dataset from the International Peace Research Institute in Oslo (Strand et al., 2003; Gleditsch et al., 2002).

2. For the purposes of this paper, insurgency-based civil wars are defined as violent crises or wars involving a non-state group as a primary actor in the conflict, using the KOSIMO dataset (Heidelberg Institute for International Conflict Research, 1999).

3. Other authors have found a connection between "excess young men" and the outbreak of violence (Cincotta et al., 2003; Goldstone, 1991, 2001; Hammel & Smith, 2002; Mesquida & Wiener, 1999; Urdal, 2002).

4. See, for example, Cincotta et al. (2003); Choucri (1974); Goldstone (2002); O'Brien (2002); Mesquida and Wiener (1999); and Urdal (2002).

5. As youth unemployment rates are difficult to measure, particularly in the developing world, a relatively large youth cohort is a good proxy for the opportunity structure in a country. Hammel and Smith (2002) call the difference between adjacent cohorts the "demographically-induced unemployment rate."

6. Youthful populations in and of themselves are unlikely to be a sufficient condition for civil war: insurgent groups must be able to form a coherent collective identity with which to challenge state authority, and they must also find opportunities for collective action (Diehl & Gleditsch, 2001). As Walter (2004) asserts, enlistment in a rebel group is only likely to be attractive "when two conditions hold. The first is a situation of individual hardship or severe dissatisfaction with one's current situation. The second is the absence of any nonviolent means for change" (page 371).

7. As measured by the square of the political regime score assigned by the Polity IV dataset (Marshall, Jaggers, & Gurr, 2004).

8. Based on the observed range of relative cohort sizes from the dataset.

9. According to the United Nations, highly developed countries include those in Europe, North America, Japan, Australia, and New Zealand. The least developed countries include most of sub-Saharan Africa and parts of Asia and the Middle East. I put the remaining countries in a third category entitled "moderately developed."

10. Author's calculations based on figures from Population Reference Bureau (2005).

11. The main exceptions are conflicts in the former Soviet Union and Yugoslavia, where relative cohort size was small but other factors enabled protracted conflict.

12. Based on information about fertility rates from "Chechnya has highest birth rates in Russia" (2005),

Ruddock et al. (1998), and Population Reference Bureau (2005).

13. Insurgent groups cannot always be deemed morally wrong (consider, for example, anti-colonial movements in many countries), but when groups feel they have no other means besides violence to enact social change, the costs for society can be enormous.

By identifying large relative cohorts up to 10 years before they reach young adulthood, policymakers and funders might devise better strategies for easing the transition, and thus reduce the chances of conflict.

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Missing Women and Bare Branches: Gender Balance and Conflict

VALERIE M. HUDSON and ANDREA M. DEN BOER

The emerging subfield of "security demographics" examines the linkages between population dynamics and the security trajectories of nation-states. For the last 5 to 10 years, researchers have examined the security aspects of such topics as the demographic transition, the sub-replacement birth rates of developed economies, the proportion of young men as compared to older men in the population, the effects of legal and illegal immigration, and the effects of pandemics such as AIDS and drug-resistant tuberculosis. We hope to add the variable of gender balance to the discussion: are societies with an abnormal ratio between men and women less secure?

Missing Women

In two areas of the world such imbalances have become fairly significant in the last half-century: 1) Russia and several former Warsaw Pact nations, where we find a deficit of adult males;[1] and 2) Asia—particularly India, China, and Pakistan—where we find a deficit of women, including female infants and children. We will let other scholars research the link between a deficit of males and national security. Our research, as explained in *Bare Branches: The Security Implications of Asia's Surplus Male Population* (MIT Press, 2004), focuses on the deficit of females in Asia. Standard demographic analysis readily confirms this abnormal deficit.[2] If we compare overall population sex ratios, the ratio for, say, Latin America is 98 males per 100 females (using 2000 U.S. Census Bureau figures), but the corresponding figure for Asia is 104.4 males per 100 females. But one must also keep in mind the sheer size of Asia's population: India and China alone comprise approximately 38 percent of the world's population. Thus, the overall sex ratio of the world is 101.3, despite the fact that the ratios for the rest of the world (excluding Oceania) range from 93.1 (Europe) to 98.9 (Africa).

Birth sex ratios in several Asian countries are outside of the established norm of 105-107 boy babies born for every 100 girl babies. The Indian government's estimate of its birth sex ratio is approximately 113 boy babies born for every 100 girl babies, with some locales recording ratios of 156 and higher (India Registrar General, 2001). The Chinese government states that its birth sex ratio is approximately 119, though some Chinese scholars have gone on record that the birth sex ratio is at least 121 (China State Statistical Bureau, 2001).[3] Again, in some locations, the ratio is higher; for example, the island of Hainan's birth sex ratio is 135. Other countries of concern include Pakistan, Bangladesh, Nepal, Bhutan, Taiwan, Afghanistan, and South Korea.[4]

Another indicator of gender imbalance is early childhood mortality. Boys typically have a higher early childhood mortality rate, which virtually cancels out their numerical advantage by age five. Boys' higher mortality is tied to sex-linked genetic mutations, such as hemophilia, as well as higher death rates from common childhood diseases, such as dysentery. However, in some of the Asian nations mentioned above,

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early childhood mortality rates for girls are actually higher than boys' (United Nations Population Division, 1998). Furthermore, orphanages house more girls than boys in these nations.[5]

What forces drive the deficit of females in Asian nations such as India and China? Why are their birth sex ratios so abnormal? Why are early childhood mortality rates for girls higher than those for boys? Why are most children in orphanages girls? How do we account for the disappearance of so many women—estimated conservatively at over 90 million missing women in seven Asian countries alone (see Table 1)?

Some scholars assert that there may be a physical cause at work preventing female births, such as the disease hepatitis B, antigens of which have been associated with higher birth sex ratios (Oster, 2005). While this may well be a contributing factor, it is worth considering the experience of the municipality of Shenzhen in southern China. Alarmed at the rising birth sex ratio, which reached 118 in 2002, local officials instituted a strict crackdown on black market ultrasound clinics. Offering up to 2,000 yuan for tips, officials then vigorously prosecuted and imprisoned the owners and technicians. By 2004, the birth sex ratio had dropped to 108 ("Shenzhen's newborn sex ratio more balanced," 2005).

Accounts such as this support the thesis that the modern gender imbalance in Asia, as with historical gender imbalances in Asia and elsewhere, is largely a man-made phenomenon.[6] Girls are being culled from the population, whether through prenatal sex identification and female sex-selective abortion, or through relative neglect compared to male offspring in early childhood (including abandonment), or through desperate life circumstances that might lead to suicide.

The gender imbalance in Asia is primarily the result of son preference and the profound devaluation of female life. This value ordering is not confined to Asia; why, then, is the deficit of women found there almost exclusively? Historically, of course, the culling of girls was not confined to Asia; evidence for this practice can be found on every continent. And practices are changing in some Asian nations: Japan normalized its sex ratios in the 20th century, and in South Korea, the deficit has been decreasing over time (Dickemann, 1975; South Korea National Statistics Office, 2001).

But this excellent question can only be answered through a multifactorial cultural analysis that examines variables such as religious prohibitions or sanctions; patrilocality (couples living with the husband's family); the duty of male offspring to support aged parents; dowry, hypergyny, and caste purity in India; the effect of interventions such as China's one-child policy; and the web of incentives and disincentives surrounding the issue of prenatal sex determination technology.[7]

Bare Branches

What effect will this deficit of females have on the security trajectory of nations? Anthropologist Barbara D. Miller (2001) has termed the preservation of a balanced sex ratio a "public good" that governments overlook at their peril. Will it matter to India and China that by the year 2020, 12-15 percent of their young adult males will not be able to "settle down" because the girls that would have grown up to be their wives were disposed of by their societies instead? With each passing year between now and 2020 (or even further), both the proportion and the number of young adult males that exceed the number of young adult females in China and India will increase (Hudson & den Boer, 2004). The Chinese have a special term for such young men: *guang gunér*, or "bare branches"—branches of the family tree that will never bear fruit, but which may be useful as "bare sticks," or clubs.

The Chinese elision between bare branches and truncheons echoes our argument: men who are not provided the opportunity to develop a vested interest in a system of law and order will gravitate toward a system based on physical force, in which they hold an advantage over other members of society. Furthermore, in a

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Table 1: Number of Missing Women for Selected Asian Countries Using Census Data

Country	Year	Actual Number of Males	Actual Number of Females	Actual Sex Ratio	Expected Sex Ratio	Expected Number of Women	Missing Women
Afghanistan	2000	11,227,000	10,538,000	106.5	96.4	11,646,266	1,108,266
Bangladesh	2001	65,841,419	63,405,814	103.8	99.6	66,105,842	2,700,028
China	2000	653,550,000	612,280,000	106.7	100.1	652,897,103	40,617,103
India	2001	531,277,078	495,738,169	107.2	99.3	535,022,234	39,284,065
Pakistan	1998	68,873,686	63,445,593	108.6	99.2	69,429,119	5,983,526
South Korea	2000	23,068,181	22,917,108	100.7	100.0	23,068,181	151,073
Taiwan	2000	11,386,084	10,914,845	104.3	100.2	11,363,357	448,512
Total							**90,292,573**

Sources: Afghanistan—United Nations Population Division, *World Population Prospects: The 2002 Revision*, http://www.un.org/esa/population/publications/wpp2000/annex-tables.pdf; Bangladesh—Bangladesh Bureau of Statistics, *Population Census, 2001: Preliminary Report*, http://www.bbsgov.org; China—National Bureau of Statistics of the People's Republic of China, "Communiqué on Major Figures of the 2000 Population Census," No. 1, April 23, 2002, http://www.stats.gov.cn/english/newrelease/statistical reports/200204230084.htm; India—Office of the Registrar General, *Census of India, 2001, Series 1: India, Paper 1 of 2001: Provisional Population Totals* (New Delhi: India, 2001), http://www.censusindia.net/results; Pakistan—Population Census Organization, Statistics Division, Government of Pakistan, "1998 Census of Pakistan," http://www.pap.org.pk/population/sec2.htm; South Korea—National Statistical Office, *Republic of Korea Census Population, 2000*, http://www.nso.go.kr; and Taiwan—Statistical Bureau of Taiwan, *Historical Comparison of the Census Results, 2000*, http://www.stat.gov.tw

Note: From *Bare Branches: The Security Implications of Asia's Surplus Male Population* (page 62), by Valerie M. Hudson and Andrea M. den Boer, 2004, Cambridge, MA: MIT Press. Copyright 2004 by Belfer Center for Science and International Affairs. Reprinted with permission.

system with too few women, the men who marry are those with higher socio-economic status. The men unable to marry are poorer, less educated, less skilled, and less likely to be employed. These men are already at risk for establishing a system based on physical force in order to obtain by force what they cannot obtain legitimately. Without the opportunity to establish a household, they may not transition from potential threats to potential protectors of society. The rate of criminal behavior of unmarried men is many times higher than that of married men; marriage is a reliable predictor of a downturn in reckless, antisocial, illegal, and violent behavior by young adult males (Mazur & Michalek, 1998). If this transition cannot be effected for a sizeable proportion of a society's young men, the society is likely to become less stable.[8]

Statistical evidence for the linkage between gender imbalance and conflict includes several excellent studies that have demonstrated a strong correlation between state-level sex ratios and state-level rates of violent crime in India (Oldenburg, 1992; Dreze & Khera, 2000). States with high sex ratios, such as Uttar Pradesh, have much higher violent crime rates than states with more normal sex ratios, such as Kerala. Historical case studies abound, since abnormal sex ratios are not a new phenomena. The 19th century Nien rebels came from a very poor region in China with a sex ratio of at least 129 men per 100 women. At first, relatively smaller groups of men coalesced to form smuggling and extortion gangs. Eventually, these gangs banded together to form larger armies, wresting territory from imperial control. It took the emperor years to subdue this rebellion.

We must not overlook sociological theory and experimental evidence, as well. For example, scholars have studied the behavior of unattached young males, noting their propensity to congregate with others like them and to engage in dominance displays in such groups. Sociologists have found that the "risky shift" in group behavior, where a group is willing to take greater risks and engage in more reckless behavior than an individual member of the group, is much more pronounced in groups comprised solely of unattached young adult males (Johnson, Stemler, & Hunter, 1977).

After examining the evidence, some predictions can be made for societies with rising sex ratios: crime rates will increase; the proportion of violent crime will increase; rates of drug use, drug smuggling, weapons smuggling, trafficking, and prostitution will increase (see Hudson & den Boer, 2004). The society might develop domestic and international chattel markets that kidnap and traffic women within the country and across borders. For example, the shortage of marriage-age women in China is fueling a brisk

business in trafficked brides from North Korea (Demick, 2003).

We must also examine the reaction of the government. Historically, we have found that as governments become aware of the negative consequences of a growing number of bare branches, most governments are motivated to do something. In the past, "doing something" meant thinning the numbers of bare branches, whether through fighting, sponsoring the construction of large public works necessitating dangerous manual labor, exporting them to less populated areas, or co-opting them into the military or police. One 16th century Portuguese monarch sent his army, composed primarily of noble and non-noble bare branches, on one of the later crusades to avoid a crisis of governance; more than 25 percent of that army never returned, and many others were seriously wounded (Boone, 1983, 1986).

We find that the need to control the rising instability created by the increasing numbers of bare branches has led governments to favor more authoritarian approaches to internal governance and less benign international presences. In many ways, a society's prospects for democracy and peace are diminished in step with the devaluation of daughters.

How will this play out in 21st century Asia? Gender imbalance does not cause war or conflict per se, but it can aggravate it. Will the internal instability caused by substantial numbers of bare branches (by 2020, 28 million in India—the same or more in China) overshadow external security concerns for the governments of these nations? Some potentially unstable situations spring to mind: the feuding countries of Pakistan and India have gender imbalances, as do China and Taiwan; and the resource-rich Russian Far East faces an influx of Chinese workers while Russia continues to lose men (Radyuhin, 2003).

How will gender imbalances affect the potential for democracy in China and the evolution of democracy in India? The gender imbalances of these two countries will not remain solely their problem, as alone they comprise more than one-third of the world's population. The status of women in these nations could become an important factor in both domestic and international security in Asia, with possible implications for the entire international system.

The Chinese government is acting on this linkage. In July 2004, they announced their desire to normalize the birth sex ratio by the year 2010, and in January 2005, they announced programs to provide old-age pensions to parents of girls. Only time will tell if these and other interventions will achieve their desired ends. In the meantime, the horse has left the barn for at least the next 20 years, for there is no way to undo the birth sex ratios of previous years. Have these Asian nations discovered the value of female life too late? The whole world is waiting to see whether bare branches will be given the opportunity to grow again.

Notes

1. In Russia and its former satellites, drug and alcohol abuse, as well as tuberculosis and AIDS, have dramatically increased the mortality rate for adult males—recent U.S. Census Bureau (2005) figures estimate that there are 10 million fewer men than women in Russia alone. This, in turn, has fueled female emigration, supporting not only to a vigorous "mail-order bride" business, but also increasingly sophisticated and far-flung transnational prostitution and human trafficking networks.

2. There are established ranges of normal variation in overall population sex ratios, as well as early childhood and birth sex ratios. These ratios are adjusted for country-specific circumstances such as, for example, maternal mortality rates and infant mortality rates. Using official census data, we can determine if there are fewer women than could reasonably be expected. Of course, there are perturbing variables: for example, many of the Gulf states have very abnormal sex ratios favoring males due to the high number of guest workers, predominantly male, that labor in the oil economies of these states. Once we take these types of factors into account, we find that the deficit of females in Asia is a real phenomenon (Hudson & den Boer, 2004).

3. Additional information provided by the director of the Chinese Academy of Social Sciences via e-mail, concerning the *Nando Times* article, "China Reportedly Has 20 Percent More Males Than Females," dated January 7, 1999.

4. No data are available for North Korea.

5. Other statistics also factor into the observed gender imbalance. In the West, for example, male suicides

far outnumber female suicides. But in countries with deficits of women, female suicides outnumber male suicides. In fact, approximately 55 percent of all female suicides in the world are Chinese women of childbearing age (Murray & Lopez, 1996).

6. For more examples, please see Hudson and den Boer (2004).

7. For a more complete cultural analysis of these practices in Asia, please see Hudson and den Boer (2004), Bossen (2000), Miller (2001), and Sen (1990).

8. Note that this transition is also less likely in societies with a deficit of males; in such societies, men need not marry or form permanent attachments to obtain food, shelter, sexual services, domestic services, and so forth. In that respect, societies with too few men and societies with too many men share some characteristics. Furthermore, societies in which marriage age is generally delayed for men can also produce instability; for example, the average age at first marriage for men in Egypt is now 32 (Diane Singerman, personal communication, July 19, 2004).

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The State of the Field: Demography and War

MONICA DUFFY TOFT

The Rise and Fall—and Rise—of Interest in Demography and War

At its root, the importance of the link between demography and war is the relative capacity of a given political unit's population to aid in its defense or to threaten other political units. For this reason, population increase and decrease have always been identified as vital security issues; however, the importance of raw population as an increment of state power has waxed and waned across time in response to technological innovations and broad normative social changes (de Bliokh, 1977; Mearsheimer, 2001).

Contemporary interest in population as a source of state military power has its origins in the French Revolution, which unleashed the power of the mass army on what was then a Europe ruled by monarchs in possession of highly specialized and relatively small professional armies (Posen, 1993). Thus beyond its normative implications regarding the proper basis of legitimate government, the French Revolution established demographics—including its emphasis on comparative birth rates—as an enduring interest of states, whether motivated by greed, insecurity, or aggression.

The Industrial Revolution threatened to change this relationship, as the railroad and the steamship made it possible to field and maintain mass armies, but the technology of automatic weapons and heavy artillery made it equally possible to destroy masses of soldiers with alarming alacrity. World War II confirmed the importance of machine over man, because the armored vehicle and—in particular—the strategic bomber appeared to make populations more vulnerable and at the same time less relevant to fighting power, except as logistical support in the form of factory workers and farmers.

Since the end of World War II, the importance of population as a key component of national security again began to rise after a series of colonial wars in which high-tech, capital-intensive militaries lost bitter contests to relatively low-tech, labor-intensive militaries in Asia and Africa, such as the United States in Vietnam or the Soviet Union in Afghanistan. Moreover, interstate wars between major powers—the type of conflict that had appeared to relegate population to insignificance from the 1880s to the 1940s—ceased to exist, while civil wars—in which population becomes a much more direct representative of a political unit's military capacity—became the norm for large-scale political violence.

Today, interstate wars seem poised to make a slow comeback, but the combination of cheap transportation technology, high birth rates in the so-called developing world, and pride in national identity have combined to make refugee and emigration flows a significant new factor in the security calculations of major states and indeed entire regions (Nichiporuk, 2000; Weiner & Teitelbaum, 2001).

Demography Matters

In short, demography matters, especially because of another long-term, post-World War II trend: the increasing democratization of states, including major states such as the Russian Federation. Because the foundation of

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democracy is the principle of majority rule, states adopting democratic forms of government find themselves keenly interested in the proportions of politically active groups that inhabit their territories (Toft, 2003).

On the other hand, despite the conventional wisdom that changes in the demographic composition of states correlate with political instability and war, surprisingly little sustained scholarly research has addressed the issue. A search of the major journals devoted to war and conflict reveals that in the last 15 years only a handful of articles have sought to understand how demographic shifts contribute to large-scale violence both within states and beyond them.[1]

There are different ways to examine the impact of demography on war. Of the major studies in existence, two factors have received the most attention: age and sex ratios.[2] Age ratio studies examine whether a higher proportion of youth is associated with a higher likelihood of revolt and war (see, e.g., Huntington, 1996). The sex ratio hypothesis holds that the greater the imbalance in favor of men, the greater the likelihood of instability and war (Hudson & den Boer, 2004). Although these hypotheses have been examined, the underlying logic and empirical support for them remain speculative. Despite dire warnings about seething populations of too many young males, neither factor has yet been shown either necessary or sufficient for violence to erupt.

Differential population growth among identity groups has been less systematically studied than other demographic factors associated with conflict and war (Weiner, 1971; Toft, 2002, 2005; Strand & Urdal, 2005). However, historical wisdom holds that identity-group balances are key to the stability of multi-ethnic states. The civil war in Lebanon, for example, has largely (and accurately) been attributed to a shift in the delicate ethnic balance in that state (O'Ballance, 1998). Similar population pressure has been used to explain Israel's pullout from Gaza and parts of the West Bank, and demographic balances are key to stabilizing Iraq's government. Given that demographic balances and shifts are vital to the stability of multi-ethnic states, and the vast majority of states on the globe are multi-ethnic, the lack of attention is surprising.

What Causes Shifts?

The relative proportions of ethnic populations in states might shift for a variety of reasons; differential birth/fertility rates and economic immigration are just two explanations. Other reasons include deliberate state manipulation (usually in the form of monetary incentives to "desired" groups to bear more children), man-made disasters such as warfare (e.g., genocide in Rwanda and Burundi), and natural disasters such as drought (e.g., famine in Sudan and Somalia). Mass migration and resettlement, both spontaneous and forced (e.g., ethnic cleansing in the former Yugoslavia), may also cause a shift in the size of the population or shifts among key factors (e.g. sex, age, identity-group ratios).

Consider the United States: the 2000 census revealed that Latinos are growing at a far faster pace than other ethnic groups. Latinos tend to have larger families (i.e., higher fertility rates) and many immigrants—largely economic—come to the United States from Latin American countries with Hispanic populations. According to U.S. census projections, if current trends continue, Hispanics—who in 2000 constituted 13 percent of the American population—will comprise 25 percent by 2050. In his most recent book, Samuel Huntington (2004) claims that the shift from a predominately white, Protestant culture to a majority Hispanic one could potentially lead to serious discord within the American polity. Whether this discord results in conflict or violence depends on a host of factors, including whether Hispanics assimilate and American political institutions adapt to the demands of this increasing population.

Why So Little Sustained Research?

Little research has been devoted to this important issue for two reasons. First, citizens of advanced industrial countries popularly believe

that technology trumps people. This prejudice, in most cases unfounded and in some cases positively dangerous, underpins a general lack of attention to everything from demographics and war, to the strategy and tactics of labor-intensive military organizations. Faith in technology extends across a wide array of social, economic, and political problems. Second, to put it bluntly, the study of demography and war is incredibly tough: data are often not available or reliable, and it is hard to separate out demographic determinants of conflict and war from more traditional factors.

Data Availability and Reliability

In order to secure reliable demographic data, a country must conduct and publish regular censuses. Censuses are not only expensive, but conducting them adequately also requires proper training of field agents and analysts. Many countries simply lack the resources and knowledge to conduct censuses properly. In addition, the process of counting a state's population requires a relatively stable environment. Countries undergoing civil strife are precisely those for which we need data, but also those in which census-taking is hampered by conflict and violence.

Population figures are easy prey for political machinations. Although censuses are vital for determining how to allocate goods and services equitably among a country's population, they can also be used as the basis for restricting opportunities to members of preferred identity groups. Data on identity groups can be manipulated in at least three ways: (1) the size of identity groups might be increased or decreased; (2) groups themselves might be excluded altogether or added to the figures of other groups; or (3) entire censuses could be withheld from publication and public debate.

Under Josef Stalin, the Soviet Union used all three methods: as part of the "Sovietization" project, officials were pressured to reduce the number of groups enumerated by the census (Clem, 1986). After the 1930s, the Migrelians, Svans, Laz, and Batsbiitsky—once identified as separate nationalities—were merged with the Georgians. In addition, when censuses in the 1930s revealed that the size of the population was not what Stalin thought it should be, the state classified the results, fearing widespread outrage had they revealed the true extent of the famine caused by the Soviet regime's collectivization efforts.

Some blame a contested census for the civil war in Lebanon, which has not conducted an official census since 1932. The "estimated" census of 1956 was largely seen as rigged, as it excluded a large number of Muslims, whose population had grown at a far faster rate than Christians (Deeb, 1980). Since political power in Lebanon is distributed among the different sectarian groups on a proportional basis, if the census revealed that the ethnic composition of the population had changed, then the distribution of power should change, too. But the Maronite Christians, who controlled the census process and data, did not want to cede any power, and as a consequence they fudged the results of the census—or at least accepted a less-than-accurate count as fact. Most outside observers agree that Christian numbers were inflated, while Muslim numbers were deflated. Although the census was discredited, it nevertheless provided the seeds of protest and grievance that subsequently led to civil war in Lebanon.

Another prominent example of how knowledge of shifts in the demographic balance can lead to instability and perhaps war is Israel, which has to adjust to demographic shifts among its Palestinian and Arab populations, as well as population differentials among Jews themselves, with Orthodox and ultra-Orthodox having population growth rates far greater than the secular Jewish population (see Fargues, 2000; Berman, 2000). Israel has pulled out of the Gaza Strip and some of the West Bank, thus ameliorating the notion of a greater Israel with a growing Palestinian population. However, Israel will still have to deal with increasing Arab and Jewish-religious populations. As in Lebanon, the nature of the Israeli political system affords these different groups political power, so as their numbers grow, so will their demands from the political system. Will Israel's

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political system be resilient enough to handle these future demographic challenges without reverting to a form of apartheid, in order to hang on to large portions of the West Bank and maintain the particularly Jewish character of the state of Israel?

Conclusions

In summary, demographics and war will continue to be an important and policy-relevant topic. Shifts in facilitating technologies—along with, in some cases, deliberate demographic strategies for attaining power and resources—continue to be under-researched and poorly understood, which leads in many cases to counterproductive or destructive aid and intervention strategies. Progress on the independent causal impact of demography on war will therefore demand careful research designs and may not be susceptible to the kind of parsimony currently so popular among social scientists in general, and political scientists in particular. Only by building a community dedicated to sustained and quality research can we redress this situation.

Notes

1. Exceptions include Goldstone (1991), Toft (2002, 2005), and Hudson and den Boer (2004). Excellent surveys include Levy and Krebs (2001) and Cincotta, Engelman, and Anastasion (2003).

2. See commentaries in this *Report* by Sarah Staveteig on age ratio and conflict, and by Valerie Hudson and Andrea den Boer on sex ratio and conflict.

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SPECIAL REPORT

Environmental Stress and Demographic Change in Nepal: Underlying Conditions Contributing to a Decade of Insurgency

RICHARD MATTHEW and **BISHNU RAJ UPRETI**

Introduction

Until recently, Nepal's presence in world news was largely limited to stories about climbers seeking to summit the world's highest mountain. In the past few years, however, the decade-long civil war between government forces and Maoist insurgents has pushed those stories off the front page. According to some analysts, Nepal is experiencing a typical form of post-Cold War conflict, in which a society's effort to democratize produces widespread discontent that erupts into violence. Since the early 1990s, the Maoists have criticized the government for not addressing social and economic inequalities. They contend that this inattention compelled them to initiate the "People's War" in 1996 (Seddon & Adhikari, 2003). Despite the fact that the monarchy legalized political parties in 1990, the royalists have also expressed concerns about Nepal's democratic experiment. King Gyanendra justified his coup d'etat on February 1, 2005, by criticizing the elected government's inability to resolve the Maoist issue, which he promised to do within three years (Timilsina, 2005).

But debates about Nepal's democracy do not tell us much about the origins and durability of the civil war. For this, we must place recent events in a broader context that considers the turbulence endemic to a rapidly growing, youthful, and extremely unequal society, in

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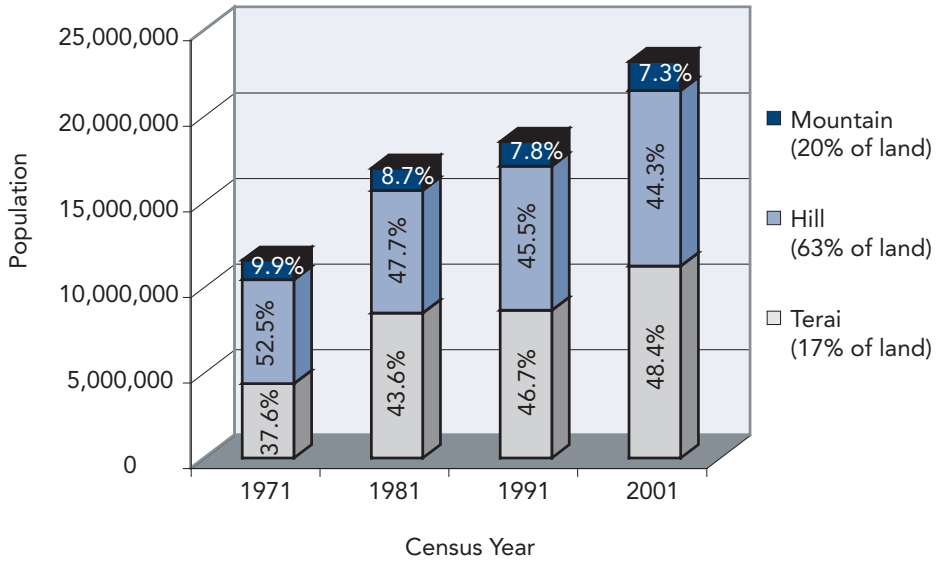
Chart 1: Population Distribution by Ecological Region in Nepal, 1971-2001



Source: Central Bureau of Statistics (2003), Table 2.2

which millions of undereducated and desperately poor people are struggling to eke out their daily existence from a declining natural resource base. Their increasingly violent struggle has undermined development initiatives and caused tourism—a key source of revenue—to drop 40 percent. In a vicious cycle, violence is limiting economic opportunity, thereby encouraging higher levels of desperation and migration, which in turn facilitates recruitment into more violence.

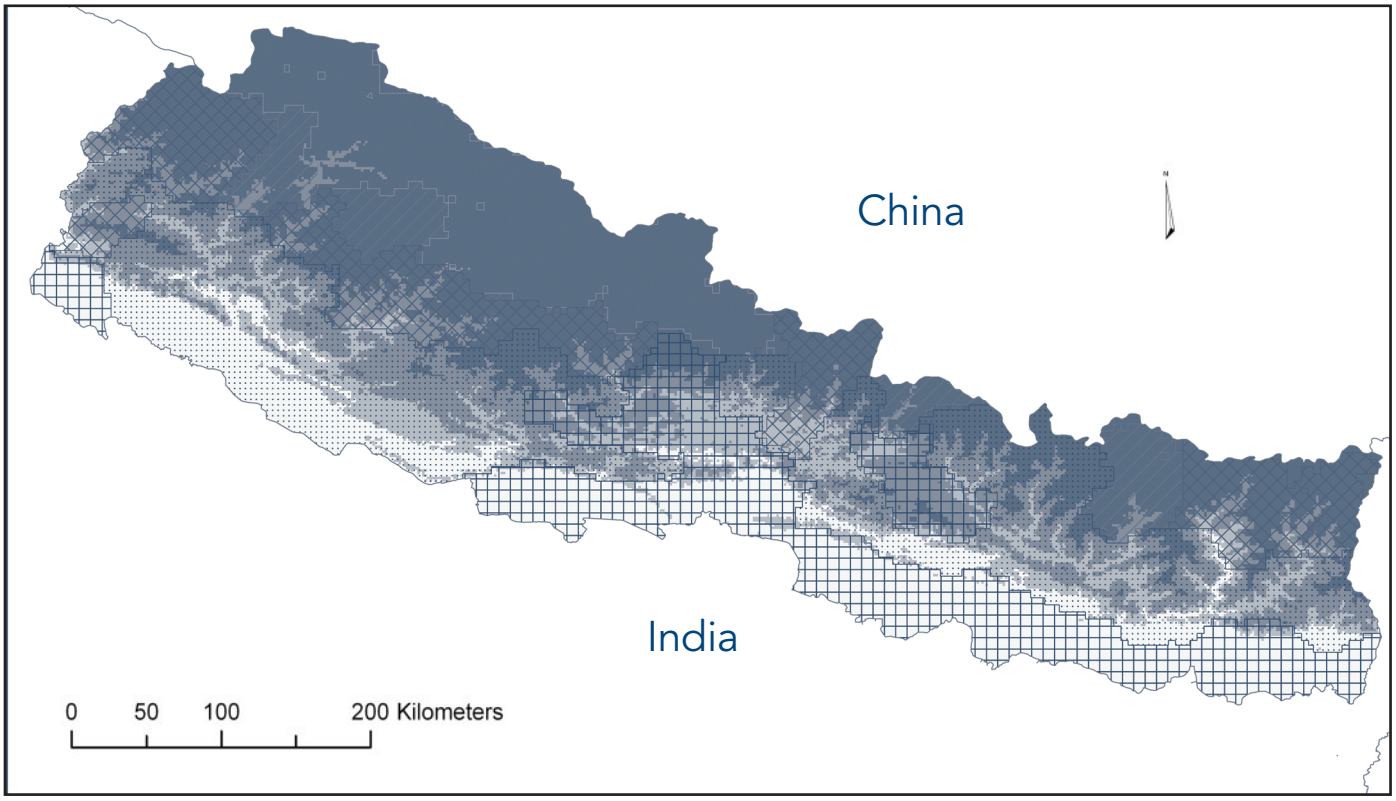
In this article, we review the broad dynamics of Nepal's current civil conflict. We argue that environmental stress and population factors have played significant roles in creating the underlying conditions for acute insecurity and instability.[1] Through a brief case study of the Koshi Tappu Wetland area, we show that this situation is evident not just in the Maoist strongholds of western Nepal, but even in remote areas of the east, thus encircling the capital region. We conclude that it will be difficult to resolve the conflict unless the underlying demographic and environmental conditions receive more attention than they have to date.

Background to Today's Conflict

About the size of Arkansas, Nepal is a landlocked country of almost 28 million people, located in the Himalayas between China and India. During the four decades following the establishment of India and Pakistan as independent states—a period of tremendous upheaval, turbulence, and violent conflict throughout South Asia—the kingdom of Nepal seemed immune to the instability that surrounded it (Pokhrel, 2001). Although many of its inhabitants were desperately impoverished—indeed, Seddon and Adhikari (2003) claim that only "20 percent of those who live in rural areas are considered [food] secure in 'normal' times" (page 11)—the feudal system of agriculture and government remained stable for decades after World War II. In fact, in 1975 the late King Birendra sought to have Nepal declared a Zone of Peace, perhaps as a way of fortifying it against internal dissent, as well as maintaining its independence from its two big neighbors (Pokhrel, 2001).

Nepal comprises three major bioregions: the fertile river plain known as the Terai in the south, the central hills region, and the

Elevation and Population Density in Nepal



Elevation (meters a.s.l.)

- Less than 500
- 500-1000
- 1000-2000
- Greater than 2000

Population Density (persons per sq km)

- Less than 25
- 25-50
- 50-100
- 100-200
- Greater than 200

Note: Map by Malanding S. Jaiteh, Center for International Earth Science Information Network (CIESIN).
Sources:
Population: CIESIN, Columbia University, International Food Policy Research Institute, the World Bank, and Centro Internacional de Agricultura Tropical. (2004). *Global rural-urban mapping project (GRUMP): Gridded population of the world* (Version 3, with urban reallocation). Palisades, NY: CIESIN, Columbia University. Available online at http://sedac.ciesin.columbia.edu/gpw
Elevation: ISciences. (2003). *SRTM30 enhanced global map—elevation/slope/aspect* (Release 1.0). Ann Arbor: ISciences, LLC.

Himalaya mountain range in the north. The economy is agrarian, although most households are not self-sufficient and rely on some non-agricultural sources of revenue (Seddon & Adhikari, 2003). Per capita GDP is estimated to be less than US$300; 47 percent of the population is unemployed and 42 percent lives below the poverty line. The median age is 20; life expectancy is 59.8; and the population growth rate is 2.2 percent. Nepal is the last officially Hindu country in the world, with about 81 percent of its population identified as such. The literacy rate is 45.2 percent overall, which hides the enormous gender gap (27.6 percent of women are literate compared to 62.7 percent of men) common to many aspects of Nepali society (CIA, 2005).

The roots of modern Nepal extend back to 1768, when Prithvinarayan Shah, the leader of a small hill state called Gorkha, conquered and unified the Kathmandu Valley. The expansionism of the Shah kings was thwarted during the 1814-1816 war against the British, from which a smaller, but fiercely independent, Nepal emerged. A Shah king, regarded as an incarnation of Vishnu, governed until 1846, when the Rana family gained control of the

Female agricultural workers in Nepal (Mukunda Bogati, courtesy of Photoshare)

kingdom, took over the office of prime minister, married into the royal family, and ruled behind a symbolic monarch until 1950 (Gayley, 2002, page 2).

Nepal's contemporary political history begins in 1950, when the Nepalese people and King Tribhuvan overthrew the ruling Ranas with support from the government of India. A Nepali democratic movement had emerged alongside India's struggle to establish itself as an independent and democratic state in the 1940s. After King Tribhuvan sought refuge from the Ranas in India in 1950, the dissidents increased their agitation for democracy, leading to the "Delhi compromise," under which the king, the prime minister, and the Nepali congress agreed to hold elections (Gayley, 2002). Even with India's support, Nepal's experiment with multiparty democracy was brief. When King Tribhuvan's son, Mahendra, came to power in 1962, he introduced the *panchayat* system, a form of democracy in which the king ruled with the support of numerous councils, or *panchayats*.

But democratic forces continued to demand change in Nepal. Student demonstrations led to a 1980 referendum in which 55 percent of the electorate voted to maintain a form of the *panchayat* system. External events further politicized Nepal, including the collapse of the Soviet Union, the 1989 Tiananmen Square protests, expanding global support for democracy, and India's 1989 decision to restrict trade after the Nepali government signed an arms deal with China, which placed considerable hardship on the Nepali economy. By 1990, persistent protests forced the government to agree to a new constitution reestablishing a multiparty democracy, which spurred the creation of more than 100 political parties and many NGOs, newspapers, and other politically engaged entities (Gayley, 2002). Despite these political changes, social change was slow, and the political left—the United People's Front—fragmented in 1994, when Comrade Prachanda founded the Communist Party of Nepal-Maoists or CPN (CIA, 2005; Watchlist on Children and Armed Conflict, 2005). The "Maoists claim to have prepared for (1994-96), launched (1996) and undertaken…their People's War in response to this failure of development" (Seddon & Adhikari, 2003).

Since 1996, the collapse of Nepali society has been truly dramatic, resulting in close to

13,000 deaths, more than 200,000 people displaced internally, and the emigration of about 1.8 million. This decade of violence has captured world attention, especially for its impact on children. According to the NGO Watchlist on Children and Armed Conflict (2005), as many as 12,000 girls are trafficked across the border into India each year, primarily to work in dangerous settings and in the sex trade; a cascade of reports accuse Maoist and government forces of raping girls; approximately 200 children are killed by landmines each year; and an unknown number of children have been recruited by both sides of the conflict to provide military services. Hundreds of schools have been destroyed or disrupted, and teachers have been targeted and harassed as well as students. Although human trafficking has plagued Nepal for decades, many of these human rights failures are directly related to the civil war. From a human security perspective, the conflict in Nepal has grown increasingly brutal and is now under scrutiny by the United Nations and numerous human rights groups.

The Dynamics of the Conflict

According to Dev Raj Dahal (2004), the conflict in Nepal emerged from two factors. First, important structural dimensions, such as the rural-urban disparity—which has been aggravated by the government's focus on the urban economy of the Kathmandu Valley—and deeply embedded discriminatory practices that defy progressive laws, such as the persistence of an "untouchable" class (the Dalits) and the marginalization of indigenous groups and women. Second, these structural conditions underlie and shape an ideological contest among liberals, monarchists, and communists. For example, in the midwestern hill regions of Rukum and Rolpa, where dissatisfaction with the state was widespread, the communists focused initially on combating social problems such as human trafficking and discrimination before turning to force. The liberals and monarchists, which have not formed a united front, compete with each other, ideologically and politically. These structural and ideological factors give rise to or reinforce political problems including corruption, politicization of public service, and human rights abuses by police and military personnel (for a more elaborate analysis, see ICG, 2003; Thapa & Sijapati, 2003; Upreti, 2001, 2003a, 2003b, 2004a).

> If the government adopts a pro-poor approach to conservation—reconciling the ecological limits of the wetland with sustainable development practices and integrating the local community into wetland management—they might win back the support of the people.

Shobhakar Budhathoki (2004) notes that the vested interests of the conflict's key players make resolving it extremely difficult. According to Dhruba Adhikary (2004), the key players include:

The monarchy: King Gyanendra's strength is based in part on the loyalty of the "unified command" that includes the Royal Nepali Army (78,000 troops), the Nepal Police (50,000), and the Armed Police Force (15,000). On February 1, 2005, the king declared a state of emergency and assumed command of the country.

The army: The fight against the Maoists has allowed the Royal Nepal Army—historically a ceremonial entity—to modernize its weapons, beef up its training, and gain battle experience.

The political parties: During the 1990s, a dozen progressive parties gained support among the Nepali people, who continue to see them as the only viable platform for democratization; however, infighting and corruption, especially following the king's dissolution of parliament in May 2002, have alienated some of the population.

The Maoists: The outlawed CPN is regarded as a terrorist organization by the state, but wields considerable control and support in much of the countryside.

Beyond these indigenous actors, the United Nations, the United States, the United Kingdom, neighboring countries such as China and India, NGOs, and donor agencies are embroiled in the conflict through their attempts to help broker a peace agreement. The end result is a complicated political landscape of scrappy, entrenched interests, none of which appears able to win the civil war or spearhead the formation of an alliance that could achieve peace and restore good governance. Because of this, many assessments of Nepal are quite bleak (Budhathoki, 2004; Pokhrel, 2001; Asian Development Bank, 2005), although some observers believe a peaceful settlement is possible (Dahal, 2004).

Consideration of population and environmental factors is absent from most analyses of the conflict. Their significance, however, affirms many of the arguments made over the past 15 years in the literature on environment and security (see, among others, Deudney & Matthew, 1999; Homer-Dixon, 1999; Peluso & Watts, 2001).

Population Factors

The population of Nepal is young, underemployed, undereducated, and insecure. According to the 2001 census, 40 percent of the population is under age 15 and the median age of the population is 20.1, compared to the global average of 26 (United Nations, 2002). More than 40 percent of the people live below the poverty line, and unemployment and underemployment are 17.4 and 32.3 percent, respectively (National Planning Commission, 2003, pages 58, 99). The official literacy rate, which differs from other sources, is 65.5 percent for men and 42.8 percent for women (Central Bureau of Statistics [CBS], 2003). Approximately 12,700 people have been killed in the 10-year civil war.

Population in this resource-thin country has increased more than five-fold in less than a century. Between 1911, when the first census was taken, and 2001, Nepal's population increased from 5.6 million to 23.2 million, and population density rose from 38.3 to 157.3 people per square kilometer (CBS, 2003, page 3). In 2001, the population growth rate was 2.25 percent and the total fertility rate was 4.1 per woman. Although agricultural output has kept pace with population growth (Seddon & Adhikari, 2003), human welfare has not improved in many areas of Nepal, which was ranked 143rd in the 2003 Human Development Index—and last in South Asia (United Nations Development Programme [UNDP], 2003).

As Chart 1 shows, population growth has not been uniform across the country, which is understandable given the relative scarcity of natural resources in the northern mountainous area. The rapid growth of the population in the Terai (plains) results from a combination of births and migration from mountains and hills, as people are lured by better physical facilities such as electricity, transportation, communications, education, and health; more productive agriculture land; and other job opportunities in the plains. The 2001 census summarizes internal migration: 62.8 percent rural-to-rural, 25.5 percent rural-to-urban, and 3.5 percent urban-to-urban migration (CBS, 2003, page 141). The rate of urbanization is also faster in the Terai than elsewhere in Nepal. Because the Terai is situated along the border with India, it also experiences informal and seasonal immigration. Finally, it is estimated that 200,000 to 300,000 people are internally displaced due to the ongoing armed conflict and most of them are living in district headquarters and urban areas.

The situation in Nepal reflects the principal findings of Phase III of the State Failure Task Force, which found "the odds of failure to be *seven times* as high for partial democracies as they were for full democracies and autocracies" (Goldstone et al., 2000, page vi). Moreover, "low levels of material well-being" doubled the odds of state failure, and "countries with larger populations and higher population density had 30-percent and 40-percent greater odds of state failure, respectively" (page vi).

Table 1: Summary of the Structural Causes of Instability in the Koshi Tappu Wetland Area

Livelihood insecurity	Environmental insecurity	Absence of reliable and affordable legal support
Lack of access to adequate supplies of safe food Lack of access to safe shelter Lack of access to clothes Human insecurity Lack of access to other basic services (such as educational and health facilities)	Disturbed ecological services Irrational use of available resources Ineffective management Unrealistic laws and regulations and their abuses Natural calamities and hazards	Non-recognition or denial of indigenous and customary practices Abuse of state laws Lack of access to laws (because they are not known, or people lack the resources or time to access the legal system) Politicization of law and justice

Source: Adapted from Upreti (2004b).

Environmental Factors

Nepal is experiencing significant environmental pressures. About 48.4 percent of the population lives in the Terai, which constitutes about 17 percent of the total land (Subedi, 2003). This land is the most productive in the country: the average yield of Nepal's major crops (barley, maize, millet, paddy, wheat, and potatoes) is 1.71 metric tons per hectare in the mountains, 2.08 in hills, and 2.61 in the Terai (Subedi, 2003). In fact, only 20 percent of the entire country is suitable for agriculture, upon which 78 percent of the total population relies for subsistence. Arable land is scarce in Nepal, and its cost is out of the reach of most people. The *Nepal Human Development Report 2004* indicates that the bottom 47 percent of households own only 15 percent of the total arable land, whereas the top 5 percent own around 37 percent (UNDP, 2004). According to the same report, 29 percent of the people are landless and more than 70 percent of the peasants own less than one hectare of arable land. This skewed distribution of land in favor of elites has been criticized by the Maoist insurgents.

In fact, the CPN has developed detailed analyses of Nepal's economic structure, which it characterizes as "semi-feudal" and "semi-colonial," along with clear recommendations for change (International Crisis Group, 2005). These reforms include "changing production relations" by "confiscating land from feudals," "mixed ownership" of land, "a protected and regulated economy," "planned development" on the Maoist model, and "balanced development" (International Crisis Group, 2005, page 6).

Terai areas are highly prone to flooding—facilitated by deforestation—during the rainy season, which compels people to move. According to UNDP (2005, page 61), forest cover declined from 37 percent to 29 percent between 1990 and 1995, a trend that appears to be continuing. The growing population depends primarily on traditional energy sources, 90 percent of which is provided by burning wood for fuel. In fact, the use of fuel wood increased slightly from 1995 to 2003, while other traditional energy sources such as cow dung declined; kerosene use remained con-

stant; and petroleum gas (LPG) jumped from 0.99 percent of energy in 1995 to 8.2 percent in 2004 (UNDP, 2005, page 66). The extremely high dependency on wood for fuel has also created air pollution and respiratory problems, in addition to producing deforestation. Flooding, land scarcity, and wood collection cause people to encroach on ecologically fragile areas such as Siwalik (CBS, 1998).

The general environmental trends in Nepal are well-summarized by L. P. Sharma (1998):

> The Midland region of Nepal is at present under the serious attack of environmental maladies. The deforestation has already been severe, so in most of the places, there is acute shortage of wood, fuel wood, and fodder to run daily life. The soil erosion has been non-stop phenomena *[sic]* aggravated floods and landslides. In most of the hill districts of Nepal, there is shortage of food supply on account of low productivity and ultimately the carrying capacity of the land has been seriously distorted. The out migration process to the valleys, plain lands and urban areas for better opportunities has been a regular practice. (page 23)

On the whole, environmental governance in Nepal is uneven and often ineffective, a reflection of the broader political processes that have afflicted the country (Upreti, 2001). There have, however, been improvements in some environmental indicators. Land protected to maintain biological diversity increased threefold from 1995 to 2004 (UNDP, 2005, page 61). The proportion of the population with sustainable access to safe drinking water increased from 46 percent in 1990 to 81 percent in 2005, and the proportion with sustainable access to improved sanitation jumped from 6 percent in 1990 to 39 percent in 2005, a gain realized primarily in urban areas (UNDP, 2005, page 70). Ironically, in some cases conservation efforts have exacerbated the environmental scarcity experienced by the growing population of poor and landless, making them more receptive to the rhetoric of the CPN. This is clear in our case study of Koshi Tappu, described below, but it is also validated by our work throughout the region with the International Union for the Conservation of Nature (IUCN; 2005).

Case Study: Koshi Tappu Wetland

A case study conducted in 2004 in the Koshi Tappu area by an IUCN research team (including the authors) reveals the strong relationships between indigenous communities and natural resources in Nepal in terms of livelihood, culture, tradition, and religion. This wetland area, located on the eastern Terai plains near the border with India, includes the Koshi Tappu Wildlife Reserve and the 16 villages surrounding it. People moved into the remote and sparsely inhabited wetland only in the mid-20th century, a migration encouraged by Nepal's government to reduce pressure on the Kathmandu Valley. Today some 78,000 people live in an area where the resources they depend upon are steadily becoming less available due to changes in land tenure, poor conservation practices, and depletion. Primary resources include gathering grass for roofing and fodder; fishing; collecting fuel, including dung and driftwood; irrigation farming; collecting rocks for construction; grazing livestock; and gathering cattails for mattresses (Bastola, n.d., pages 4-5). The region's population growth rate is 2.8 percent, adding more pressure on resources (Bastola, n.d., page 3).

Nepal leased 5,000 hectares of the wetland to India in 1954 to permit the construction of a dam so that water could be diverted to irrigate farms in the Indian state of Bihar. A wildlife reserve, established in 1976 and expanded in 1979, is now classified as a Ramsar Wetland of International Importance.[2] Little or no compensation was offered for the residents' decreased access to resources and the Maoists have channeled frustration with this situation into support for their insurgency.

During in-depth interviews conducted on site, representatives of the 19 ethnic groups dependent on the case study area's natural resources explained that their traditional or cus-

tomary rights to local natural resources have been curtailed or denied (Upreti, 2004b; Matthew, 2005).[3] Consequently, their livelihoods have become increasingly perilous, and their willingness to engage in protest and crime has increased.

The problem has at least three interactive causes. First, local people have seen few benefits from the development of the dam, the Koshi Barrage, in part due to barriers such as language and lack of information. For example, the construction of the dam relied heavily on labor imported from India. Second, in the 1950s, the availability of abundant natural resources and fertile land attracted a large number of migrants from nearby hilly regions. But as resources became relatively scarce, the construction of the East-West Highway made the area accessible to even more migrants from other parts of the country (Heinen, 1993; Sharma, 2002). Finally, conservation efforts, including the decision to protect the area as a Ramsar site due to its remarkable biodiversity, have further restricted access to essential resources, including fish, birds, forest products, and grasses. Reserve wardens have introduced the political corruption endemic throughout the country, allowing some people to access the reserve's resources for a fee or other considerations.

The resources that are available to the residents are woefully under-serviced. Since irrigation facilities are inadequate, farmers depend upon rainwater. Much of the area lacks a reliable means of transportation, making it extremely difficult to reach the market, schools, and hospitals, especially during the rainy season.

The Maoist insurgents have promised to return the reserve land to the local inhabitants, thus underscoring their appeal to the beleaguered residents. However, a recent study conducted by IUCN (2005) offers some grounds for optimism: if the government adopts a pro-poor approach to conservation—reconciling the ecological limits of the wetland with sustainable development practices and integrating the local community into wetland management—they might win back the support of the people.

Conclusions

The current crisis in Nepal has not only eroded social capital but has also ruined community relationships, undermining indigenous forms of social networks and institutions that once glued the society together. The state has not been able to reduce poverty, control the exploitation of disadvantaged communities by those in power, prevent environmental degradation, or generate employment opportunities for the large mass of unemployed people. Semi-educated and unemployed youths are a handy reservoir for the Maoist insurgents, providing justification for their cause and recruits for their war (Cincotta, 2003; Upreti, 2004a). As Nepal's human development indicators flounder, its population continues to grow, placing enormous pressure on natural resources and on the relatively prosperous Kathmandu Valley.

Knitting Nepali society back together will not be an easy task, and the current focus on political reform and reducing socio-economic inequalities is essential. As we write, the CPN has forged an alliance—brokered in India—with mainstream political parties, which is regarded by some analysts as more focused and promising than the previously intermittent dialogue. However, the royal palace has been excluded from this agreement and is trying to discredit it. At this point in time it is unclear whether the uneasy truce will continue, or whether this new alliance will coax the royalists into a meaningful and stable settlement.

In any case, we believe that rapid population growth and environmental degradation are important elements of what has gone wrong in Nepal, and they must be addressed before stability can be restored. The following recommendations could help provide a solid foundation upon which to advance the fragile political process:

- Accept and act upon the recommendation of the United Nations International Conference on Population and Development, held in Cairo in 1994, which emphasized empowering women, focusing

We believe that rapid population growth and environmental degradation are important elements of what has gone wrong in Nepal, and they must be addressed before stability can be restored.

on reproductive and sexual health, and understanding the integral linkages between population policies and development strategies.

- Shift the focus of conservation efforts toward IUCN's pro-poor approach to conservation, which seeks to ensure that conservation efforts: do not further disadvantage the poorest people in the area of environmental concern; consider and adopt mixed-use strategies when possible; offer fair compensation in exchange for reducing access to resources; and respect customary and statutory property rights.
- Use the Millennium Development Goals as a guide to policymaking and as a baseline for measuring policy impacts.

Finally, the situation in Nepal must not be simplified into a fight against left-wing terrorism. Rather, its complex nature—including population factors and environmental degradation—must be understood so that the rest of the world can provide appropriate assistance and support.

Notes

1. For a general discussion of the relationship among population factors, environmental stress, and state failure, see Goldstone et al. (2000).

2. The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty that provides a framework for national action and international cooperation for the conservation and use of wetlands and their resources. There are presently 147 contracting parties to the convention, with 1,524 wetland sites, totaling 129.2 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance. For more information, see http://www.ramsar.org/

3. The main ethnic groups are Sunaha, Khanwas, Mallahs, Bote, Mushahars, Bantar, Gongi, Mukhia, Dushad, Sahani, Kewat, Danuwars, Darai, Kumal, Barhamus, Dhangar, Pode, Kushars, and Majhi.

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SPECIAL REPORT

Speaking Truth to Silence: There's Still a Place for the Demographic Case

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Introduction

During two days in late July 2005, the Maradi refugee camp in Niger took in hundreds of malnourished children—and one truck just half filled with food supplies (Koinange, 2005). The United Nations World Food Program announced it would begin airlifting 23,000 tons of food to Niger, where Giancarlo Cirri, the program's director, reported "some of the worst hunger I have ever witnessed" (CNN, 2005). But the promised food was slow to arrive.

Less than 2,000 miles away, impoverished rural communities in northern Kenya worked to recover from a brutal bloodletting in which cattle rustlers killed villagers, who killed right back in reprisal. At least 80 people died.

"Explosive population growth has increased pressure on land, forcing farmers to sell crops on 'corridors' traditionally used by migrating herders for access to rivers, further stoking conflict," commented Reuters reporter Ed Stoddard (2005) in a news story about a spate of deadly conflicts in sub-Saharan Africa related to land scarcity.

"'This is the age-old farmer/herder conflict, the old Biblical tale of Cain and Abel. The struggle over resources between people who are using them in different ways,' said Henri Josserand, the head of the UN's Food and Agriculture Organization's Global Information and Early Warning System," Stoddard reported.

Thus did the journalist and the UN official speak to an issue only occasionally addressed in most recent discussions of hunger and conflict in developing countries: the human and environmental impact of population growth that, contrary to some perceptions, continues in most of the world. In this article I will first consider this issue in the context of these events in Niger and Kenya. Second, I will briefly survey some current views and approaches in the non-governmental, academic, and international communities. Third, I will address four questions I was asked by a task force reviewing population issues for the David and Lucile Packard Foundation:

- What are the connections among reproductive health, education, economic opportunity, and natural resources?
- Does preservation of Earth's natural systems remain a viable rationale for programs designed to slow population growth?
- What kinds of message frames are most effective for influencing policymakers involved with decision-making around resource allocations for foreign aid for reproductive health in the case of donor countries, and public resources for reproductive health

in developing countries?

- What is the connection between the demographic transition and political stability in developing countries?

Finally, I will suggest some ideas and directions for future population-environment (PE) funding and work.

Population Trends: Underrated, Uncelebrated

Increasing population density is, of course, hardly the only or most immediate factor in Niger's hunger or Kenya's land conflicts. If there is any consensus on population's influence on human affairs and the natural environment, it is that its role is complex, indirect, and inevitably entangled with other factors (Marquette & Bilsborrow, 1999). For decades, the poorest of Niger's rural population have suffered severe hunger periodically, and the 2005 crisis has been blamed in part on free-market policies that the country's government adopted under pressure from the World Bank (Timberg, 2005; Vasagar, 2005). Based on benchmarks developed by Population Action International (PAI) for population-related shortages of critical natural resources, for example, Niger is neither water-stressed nor short of cropland on a per capita basis.[1] It does have little forested land, however, and its projected population growth would make it water-stressed within roughly a decade.

If Nigerien and Kenyan farmers were as productive as those of Iowa or Thailand, and if their governments were comparably effective and accountable, it is reasonable to presume that none of this would be happening today. But are these "non-demographic factors" likely to improve enough to negate the impact of continuing population growth in Niger and Kenya? If high food prices in the West African regional economy are a factor in Niger's hunger, for example, might those prices stem in part from a dynamic in which demand is rising faster than supply, a dynamic that weak governments are unable to prevent or mitigate? Those of us concerned with population and reproductive health should be trying to find answers to questions like these.

The historic slowing of the world's population growth in recent years is in large part due to four decades of private and public donor assistance to the international family planning movement. Most current analysts fail to ask why this demographic revolution is happening—and then assume that it is now complete or soon will be. It is neither. The planet's human population still gains more than 200,000 people a day, a quarter of them in Africa, where the fastest growth occurs.[2] Yet well over half the daily increment is Asian, enlarging populations in China and much less stable regions, including the Middle East, South Asia, and the Philippines. More than 5,000 a day are born in the United States, which, like many developed and developing countries, also gains a few thousand people each day who were born in other countries, on other days.

From governmental policy papers to the pages of newspapers, however, ongoing population growth is notoriously hard to make exciting, fresh, or worth exploring. Demographic pundits take more interest in population aging. Environmental pundits take more interest in consumption. Poverty and conflict pundits take more interest in anything *but* the dynamics of human population. The reasons are understandable: population has always been controversial, and, frankly, its relation to human and natural well-being *is* complex, indirect, and inevitably entangled with other factors. What makes it worth pursuing by advocates and donors, however, is arguably more relevant than ever: slower population growth—yielded by women and couples bearing the number of children they intend—has major cross-cutting benefits that multiply with time. It is hard to imagine another achievable development trend with so much long-term promise for environmental conservation and global stability.

The historic slowing of the world's population growth in recent years is in large part due to four decades of private and public donor assistance to the international family planning movement.

Still Waiting for Demographic Transition

News accounts of Niger's hunger crisis in summer 2005 uniformly failed to note that the small nation is the caboose on the train of global demographic transition. While most countries have moved significantly toward longer lifespans and smaller families, Niger's total fertility rates (TFR) and life expectancy have barely budged since independence in 1960. The country has the world's highest TFR (7.5 children per woman) and second highest infant mortality rate (nearly 15 percent). Because so many of its infant girls fail to reach the median reproductive age, Niger's replacement fertility rates are the third highest in the world, at 3.15 children per couple. Only 4.3 percent of married women of reproductive age use modern contraception, the seventh lowest proportion worldwide. Despite relatively low HIV/AIDS prevalence (less than 2 percent of reproductive-age adults), a baby born in Niger is likely to die before reaching age 45, the 18th lowest life expectancy in the world (UN Population Division, 2005).

This dismal demographic and health profile hardly condemns the impoverished country to perpetual famine. Niger's government and institutions are weak, and a world obsessed with terrorism and a teetering global economy puts little priority on donating food or providing assistance to Niger's 12 million to 14 million people.[3] Foreign investment is close to nonexistent, and the country has no pool of emigrants to send home remittances. Government donors provided just $5.8 million annually—one dollar for each person of reproductive age—for population activities from 1992 to 2002 (UN Population Fund, 2004).

Economists, journalists, and other analysts who are counting on an "expected" world population of nine billion in 2050, based on the United Nations' medium projection, aren't paying attention to Niger and countries like it. Total fertility rates have barely edged downward for the past six decades, but despite the current low level of donor and government investment in family planning, UN demographers project future Nigerien population based on the assumption that total fertility will fall to less than half its current level over the next four decades. This could happen, but there is no compelling reason to expect it to do so, absent major increases in family-planning assistance that are nowhere in sight. The UN's "medium" world population projection, which drives most futurist thinking, is based on the assumption that the developing world as a whole will reach replacement fertility before mid-century. But UN demographers lack the resources to incorporate country-specific fertility trends, much less those related to population policy and funding, in their assumptions. The experience of countries like Niger undermines the expectation that world population trends will follow the "expected" path.

A landlocked country of subsistence farmers, Niger scarcely registers on the priority lists of major foundations and governments. But its direction in 2005 nonetheless speaks to the importance of philanthropy and government aid in enabling all people to choose the timing of childbirth. Niger's hunger crisis and Kenya's land conflict are recent, news-making illustrations of a growing set of problems that closely relate to the complex relation between human population dynamics and the natural environment. These problems are more urgent than mere "population impacts on the environment," because they deal with death from hunger and violence.

It is hard to find consensus views on population's connections to natural resources, the environment, security, and economics. The field remains not only controversial but marginal in scientific and policy discussions. Its profile rose somewhat in the 1990s but has fallen since. Most in the small community of scholars, policy analysts, and activists who ponder these connections agree that the nexus of human population and the natural environment is critically important to humanity's future. They agree that population dynamics are some of most important factors in environmental change. Many also agree that govern-

Madagascar: mothers stand in line to have their children weighed (Courtesy of USAID)

ments need to act to make family planning and reproductive health care genuinely accessible to all, along with more education and better economic opportunities for girls and women. It is a logical, practical, and consistent message—and for understandable reasons, it has gone stale.

The Rise and Fall of NGO Interest

Philanthropic funding for PE research and advocacy rose sharply in the 1990s and then fell almost as dramatically in the next decade (Gibbs, 2003). Not surprisingly, PE activity by non-profits also fell in tandem, but whether this was a cause or an effect (or both) of the drop in funding is hard to discern. One likely explanation: despite good efforts and a few logical sound bites, a compelling and easily communicated advocacy case for funding family planning activities worldwide failed to materialize. Most environmentalists found the complexities of the nexus and its sensitive connections to gender, North-South tensions, and immigration too daunting and too "far from mission" to embrace. Population and reproductive health groups had, for obvious reasons, invested more in the effort (and many continue to pursue it). But all of us are hampered by the palpable decline in interest from most quarters.

The PE connection appears to be simultaneously obvious *and* complicated—and just not that interesting to most people. The widespread misperception that population growth is slowing so fast it will soon reverse course "on its own" undermines advocacy for policies that would slow population growth. The many other benefits of these policies—better access to family planning services, more girls in school, more women working and gaining access to credit—help, but not enough.

This loss of interest goes beyond the environmental connection to population. The key concept of reproductive health, a triumph of international agreement at the United Nations International Conference on Population and Development (ICPD) in 1994, failed to gain a single mention in the UN's Millennium Development Goals (MDGs) six years later.[4] Reproductive health advocates are now working to clarify the concept's importance in the supporting materials for the MDGs, but the original omission can scarcely be waved away (Crossette, 2004b). Within the already-margin-

alized field of reproductive-health-as-development, the demographic arguments that held sway in past decades are virtually silent. A few exceptions, such as the work of Jeffrey Sachs[5] and Jared Diamond (2004), stand out as welcome signs of life in the demographic case.

Interestingly, the debate between "population-environmentalists" and advocates for women's rights and health that characterized much of the 1990s has largely fallen silent. Betsy Hartmann, director of the Hampshire College Population and Development Program, still speaks occasionally on the topic. The Corner House, a British nonprofit, recently published a critique of the idea that "youth bulges" (disproportionately large numbers of youth) may contribute to civil conflict (Hendrixson, 2004). Most other women's rights and health advocates uncomfortable with demographic messages know they have won the skirmish and see no need to keep fighting. Mentions of demographic change are all but absent from most intergovernmental and NGO meetings on sexual and reproductive health and rights.

The PE linkage does thrive in a humbler setting: the few dozen community conservation and development projects in which reproductive health is combined consciously with natural resource management. This operational linkage, difficult to explain and even harder to monitor and evaluate, has not taken the community-development world by storm. Some projects have disappointed. But in the projects' marginalized rural communities, women and their families are finding the synergy that personal management of fertility, health, and the local environment appears to create.

New directions in the NGO arena appear promising. Many groups working on this linkage strategically include health as well, turning the "PE" acronym into the less demographically edgy "PHE." This explicit inclusion makes sense, because the pivotal center of the PE connection is human health and well-being. Environmental groups such as the National Audubon Society, the National Wildlife Foundation, the Sierra Club, and the Izaak Walton League continue small PE programs. Most of the major population NGOs maintain at least some activity in this arena.

Innovative approaches could bring clarity to new audiences. Roger-Mark De Souza, technical director of the Population Reference Bureau's (PRB) population, health, and environment program, reports that PRB uses "new points of entry" to bring policymakers and communities to the PE linkage (personal communication, August 10, 2005). Constituencies are approached on such issues as poverty alleviation, food security, and disaster mitigation—especially in the wake of the December 2004 tsunami—and then gradually introduced to reproductive health, the environment, and their relationships to these issues. "You could see that the destruction of the tsunami was exacerbated by unsustainable management of natural resources, migration, and other population dynamics such as age structure," De Souza says. "None of this, of course, was well documented."

Researchers: Let a Thousand Flowers Bloom

Common perceptions about population and the environment have impeded the production of respectable research. The academic community associates interest in population growth with predictability and shrill advocacy, and understandably wants to distance itself from these. There have been no overviews of population and the environment since the 1990s, and only one balanced but tame scientific policy statement (i.e., Global Science Panel on Population and the Environment, 2001).[6]

"The field has matured," notes Alex de Sherbinin, coordinator for the Population and Environment Research Network, a project of the International Union for the Scientific Study of Population (IUSSP; personal communication, August 3, 2005). "More scientists are reluctant to engage in Paul Ehrlich-type 'population-bomb' discourse. If anything, they take pains to go the other direction and say population is a non-factor." Scholars are increasingly taking apart and analyzing the components of

the population-environment linkage in what de Sherbinin calls a "nuts-and-bolts approach."

"When you say population and environment, what does it really mean? People are now disaggregating population into age structure, household characteristics, gender, income. I think it's very exciting work." Some researchers decry the failure to develop any specific theory of population and the environment—or even to agree on key methodologies such as those that produce widely cited population projections. De Sherbinin appreciates the diversity and feels it may lead to better understanding of the linkage: "I say let a thousand flowers bloom." But he acknowledges it has been harder to gain funding for some of this work from foundations interested in policy advocacy, or at least policy relevance.

"It's a nuanced approach that I think may yield better understanding of what the policy levers are," de Sherbinin says. "We're trying to make population and environment relevant to policymakers beyond simply saying that you need to spend more money on family planning or environmental conservation. But the diversity of research results sometimes makes it hard to fit into the traditional policy frame." In this case, what may be good for scientific respectability—population and environment sessions are now universal events at meetings of the IUSSP and the Population Association of America—may be less useful for advancing the population and reproductive health policy agenda.

PE Policy: Exceptions Prove the Rule, but Hint at Hope

In the absence of clear interpretations either from academia or NGO advocates, it is hardly surprising that policymakers rarely have much to say on the population-environment linkage. In the United States, the advocacy communities for both international reproductive health and the environment feel besieged as the White House and Congress take their cues from the religious and economic right. But even in European capitals and in the offices of the World Bank and the United Nations, only the bravest of bureaucrats acknowledge intersections between population and the environment. The linkage is a marginal topic embedded in a marginal issue, population growth, which itself is the victim of low levels of both public and elite interest. Europe faces the challenges of aging and declining populations and understandably feels a heavy hand on rapid population growth in developing countries would come off as arrogant and "post-colonial." Universally, the risks of—and responses to—ongoing population growth have been almost impossible to bring to the world stage since the ICPD in 1994, despite high hopes that the rights and development framework emerging from the conference would make it easier to address demographic change.

Half of the eight MDGs (empower women, reduce child mortality, improve maternal health, and combat HIV/AIDS) relate strongly to reproductive health, despite the lack of mention. The seventh goal—"ensure environmental sustainability"—is a logical platform for considering demographic-environmental connections. Some UN supporting language for the MDGs noted the contribution of population growth to water scarcity, urban crowding, and increased greenhouse gas emissions. Population and total fertility, however, were

> Population aging will challenge societies, but that challenge pales in comparison with those presented by advancing water scarcity, climate change, and the loss of nature itself. Without the peaking and decline of population that replacement or sub-replacement fertility will eventually produce, natural resource use is unlikely ever to be sustainable.

dubbed "general indicators of development," isolated from achievement of any of the goals.

The linkage of population growth to environmental and social problems gained a bit more attention from the Commission for Africa (2005), launched by British Prime Minister Tony Blair and made up primarily of African representatives. The panel's 461-page report mentioned the rapid demographic growth the continent has experienced in the last few decades, connected this growth in general terms with many of Africa's development challenges, and called at several points for attention to reproductive health access and more education of girls. The report's attention to these linkages served to underline that the linkage remains alive in international affairs, even if it is rarely visible. Difficult as it is for most policymakers and analysts to take on directly, the linkage may be too powerful and obvious to completely escape mention for long.

In an even more surprising acknowledgment of the PE connection, in 2002 Congress directed the U.S. Agency for International Development (USAID) to include in its allocation of family planning assistance money "areas where population growth threatens biodiversity or endangered species." (H.R. 2506, 2001). Despite the generally hostile environment in Washington for almost all things population *or* environment, this language became appropriations law and has now survived three funding cycles. Perhaps no other recent development better illustrates the potential for application of the population-environment linkage to improve human and environmental conditions worldwide. The legislation led directly to the founding in 2002 of a PHE program within USAID to fund projects providing reproductive health services in and around biodiversity "hotspots," areas of high biological diversity under direct human threat. That program, in turn, proved complementary to private philanthropic funding for reproductive health in high-priority conservation countries.

The USAID program already has provided an estimated $9 million to projects linking natural resources management and improved access to reproductive health care in eight biodiversity-rich countries: Madagascar, the Philippines, Kenya, Tanzania, Guatemala, Nepal, Cambodia, and the Democratic Republic of the Congo. USAID country missions in the Philippines, Nepal, Tanzania, Madagascar, and Cambodia have each added to the total by committing $200,000 to $300,000 for integrated projects in their countries. And they have added a cross-sectoral focus to their own strategies for addressing such multifactor challenges as HIV/AIDS and fragile states. Many grantees—largely conservation organizations such as World Wildlife Fund-U.S., Conservation International, and the Jane Goodall Institute—had recently lost the support of private foundations for similar work, so the U.S. government money came not a moment too soon.

Are these projects valuable, or do they merely bring a dollop of added family-planning access to a few thousand couples among the world's billions? A recent review by independent consultant John Pielemeier of 17 projects supported by the Packard Foundation and USAID concluded that most were achieving results within 9-36 months, producing reproductive health and environmental outcomes superior to those of single-sector interventions, and—critically—drawing boys and men to reproductive health care and women to natural-resource education and management.[7] Such projects increase the acceptability of contraception by linking it to women's need to manage their time in increasingly complex livelihood roles stemming from male migration. As an added benefit, project stories can teach the public and policymakers that reproductive health is an essential component in economic development and well-being in every corner of the world.

The future of this work seems uncertain, with USAID itself operating under an ongoing threat of international-assistance "restructuring." Absent major change, however, the U.S. government will be the major funder of applied PE work in developing countries until major private donors return to this work.

The Four Questions: What Are the Connections?

Population size is the dominant determinant of the scale of humanity and its activities on a planet of finite space and resources. Consumption patterns also help determine this scale, especially when models of excess encourage societies and consumers to acquire at the expense of community, sustainability, and shared well-being. However, no variation in individual behavior could prove as decisive as the planetary imprint of 6.5 billion human beings, compared to that of the small numbers that characterized our species in prehistory. The actions societies take today can determine whether population growth ends in our lifetimes because birth rates fall, or in generations from now because death rates rise.

Universal access to decent family planning services, education for girls through at least secondary school, and a full array of economic and social opportunities for women would almost certainly bring global total fertility rates to replacement levels within two or three decades. Maybe they would go lower still. Population aging will challenge societies, but that challenge pales in comparison with those presented by advancing water scarcity, climate change, and the loss of nature itself. Without the peaking and decline of population that replacement or sub-replacement fertility will eventually produce, natural resource use is unlikely ever to be sustainable except for the worst of reasons: low availability and high prices that continually worsen as human numbers keep growing.

Is Preserving Natural Systems a Rationale for Slowing Population Growth?

In each of the Earth's major natural cycles or systems—renewable fresh water, carbon and climate, fertile soils, forests, fisheries, the oceans, coastal and marine areas, wetlands, and the biological diversity of life itself—the single biggest agent of change today is the scale of human exploitation and use, and the biggest questions concern the future of that scale. Managing the global environment requires more appropriate behavior and technology. But a growing world requires constant effort to modify behavior and technology, and laws of diminishing returns undermine such strategies over time. No one knows when and at what levels human population will level off and begin to gradually decline, so no one can predict with confidence when the overall scale of human activity will begin to recede.

Some of these systems—climate and fisheries globally, and soils and fresh water in some countries—are now approaching crisis stage. The stories of Niger and Kenya illustrate the human dangers and tragedies associated with ignoring such crises. Trends in human energy use and settlement infrastructure (housing, transportation, and sanitation) are more worrisome today than they have been in decades or longer. Policies that result in slower population growth would produce expanding—not diminishing—returns over time.

What Messages Influence Policymakers?

The education of key policymakers (or their staffs) can produce change, even in a challenging policy climate. Each government includes at least a handful of potential leaders, and as the world's future grows more uncertain, more voters are likely to demand precautionary policymaking rather than business as usual. Balanced policy advocacy that combines good science with practical advice can be effective, even if sometimes overwhelmed by raw political maneuvering. No messages resonate with all policymakers, but many respond to such themes as:

- Encouraging women's contributions to their societies by reducing gender inequality and encouraging autonomy;
- Enabling children to survive by assuring the availability of safe water, adequate food, and clean air;

Those concerned about security should promote access to reproductive health, HIV/AIDS prevention, and other measures that tend to contribute to lower death rates and lower birth rates. It is too early, however, to say that this linkage between demographic transition and political stability is fully understood, much less accepted, among policymakers.

- Reducing rather than adding to the unfairness of life;
- Helping those who want to help themselves; and
- Leaving the planet and its living things no worse off than when we arrived.

At PAI, we have found that nothing convinces lawmakers like a visit to a family planning clinic in a developing country. There are risks in calling attention to national and local impacts of population growth, but it seems likely that Americans are feeling "population pressure" more acutely than ever in the rising prices of energy and housing. As these and similar discomforts continue, there may be new ways to relate the experience of voters to the actions of their elected officials that influence the course of world population and the global environment.

What Connects Demographic Transition and Political Stability?

In our report *The Security Demographic: Population and Civil Conflict After the Cold War,* Richard Cincotta, Daniele Anastasion, and I (2003) experimented with a new frame for considering demographic change as a causal factor in human affairs. Rather than focus directly on population *growth*, which is off-putting to many audiences and is rarely the only demographic factor involved, the report considered *demographic transition* as the salient variable in the case of civil (internal or intrastate) conflict. This concept has the conceptual and advocacy advantage of stressing survival rates, life expectancy, and general development as much as total fertility and birth rates. Moreover, our data indicated that progress through the demographic transition correlates strongly with reductions in the risk of new civil conflicts in any period. Several interacting factors appeared to be at work:

- High proportions of young men aged 15-29, who, if not optimally employed, search for less positive and often violent ways to validate their lives;
- Low availability of cropland, encouraging young people to move to cities; and
- Rapid urban population growth, stemming in part from the first two factors and providing locales for a critical mass of disaffected young people to organize for conflict.

Ironically, this dynamic ends up not only predicting to some extent the potential for conflict but producing a "surprisingly heartening view of the future," as Jack Goldstone (2004) noted in *ECSP Report 10.* As countries move through the demographic transition—as most are—their vulnerability to civil conflict should decrease, offering hope for a more peaceful world. Hence, those concerned about security should promote access to reproductive health, HIV/AIDS prevention, and other measures that tend to contribute to lower death rates and lower birth rates. It is too early, however, to say that this linkage between demographic transition and political stability is fully understood, much less accepted, among policymakers. PAI is continuing its research and would welcome more academic and policy researchers joining in the study of demographic factors in conflict and security.

A Strategy for Funding and New Work: Hypothesis and Opportunism

For understandable but unfortunate reasons, the U.S. philanthropic community has largely turned away from the population-environment-security-livelihood connection over the last several years. Many of the foundations that best understood this linkage have suffered financial reversals and have focused their limited funds on their core areas. New funding strategies are necessary—and possible. Funders, researchers, and advocates might consider strategies based on clearly articulated hypotheses of how population dynamics interact with the environment and human well-being, and how those dynamics can be influenced. Hypotheses help to make sense of the world's complexity by helping us select opportunities from the myriad possibilities and

ultimately build theories of how the world works. The lack of theory in population and reproductive health is among the reasons policymakers do not pay more attention to these disciplines. We should monitor the globe for opportunities to test and refine our hypotheses in countries facing PE challenges, and target funding to these efforts. If confidence in the usefulness of these hypotheses grows, they can be applied to communication and advocacy efforts.

Continuing to implement, support, and document PHE projects in developing countries is vital. Though the operational linkage still needs better documentation, and clearer indications that its impact can be broadened from thousands to millions, these projects provide material for communication and advocacy by demonstrating that connecting reproductive health to the environment can improve lives. The world needs to see the faces of the women and their families in whose lives these factors unite to build livelihoods, well-being, and the survival of nature.

Success is hardly foreordained with a reality so complex. Most policymakers may be silent on the linkage of population dynamics with environmental change and human well-being. But voices of influence recognize the importance of this linkage and help keep awareness—and the possibility of strategic action—alive. If we are right to believe that rapid population growth makes critical natural resources scarcer and that stalled demographic transition contributes to political instability, the unfolding of future events, sadly, will validate our hypothesis. But the hypothesis works as well in reverse. We can educate policymakers. We can act on the linkage. We can improve lives by promoting with one strategy reproductive health, the demographic transition, and environmental sustainability. No private or public donors today support such work on the scale required. Many can—and should.

Author's Note: *This article is a revision of a paper written for the David and Lucile Packard Foundation in August 2005. I thank Elizabeth Leahy of PAI and Jennifer Dusenberry of Georgetown University for research assistance, and Tom Outlaw for information on USAID's population, health, and environment program. The opinions expressed here are my own.*

Notes

1.For more on PAI's natural-resource benchmarks of stress and scarcity, see Cincotta et al. (2003); see also the methodology section of PAI's *People in the Balance: Update 2004* (Engelman, 2004).

2. World and African population gains calculated based on annual figures from United Nations Population Division (2005).

3. The higher figure is the most recent medium projection for 2005 by the United Nations Population Division. The lower figure is from Soumana Harouna et al. (2005), writing for the Nigerien Ministry of the Economy and Finances.

4. For the UN documents that established these goals, please see http://www.un.org/millenniumgoals/, particularly the Millennium Declaration and the Secretary General's Report.

5. "I do say that in many parts of rural Africa there is absolutely a Malthusian crisis under way, " Jeffrey Sachs told Barbara Crossette (2004a, page 34).

6. According to its web-based statement, "the Global Science Panel comprises over 30 distinguished scientists from various disciplines and comes under the joint patronage of Maurice Strong and Nafis Sadik. The Panel is coordinated by Wolfgang Lutz and Mahendra Shah, and receives financial support from the UNFPA, the government of Austria, and the MacArthur Foundation." For more information see http://www.iiasa.ac.at/gsp/

7. A summary of John Pielemeier's presentation at the Woodrow Wilson Center, "Measuring Impact: A Review of Packard Foundation and USAID's First Generation Population-Environment Projects," is available online at http://wilsoncenter.org/index.cfm?topic_id=1413&categoryid=A8374B58-65BF-E7DC-4FAA15117F5B45C2&fuseaction=topics.events_item_topics&event_id=143972

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SPECIAL REPORT

U.S. Military and Environmental Security in the Gulf Region

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REAR ADMIRAL JOHN F. SIGLER, USN (RET.)

Introduction

The United States Department of Defense defends the nation's security interests, which, over the past decade, have become more broadly defined. Today, U.S. forces find themselves employed in a wide range of nontraditional activities, including those that may fall in the category of "environmental security." In response, the U.S. military has developed programs to encourage cooperation with other nations' militaries based on environmental security, defined as "an integrated proactive approach that ensures the protection, preservation, and restoration of the environment, including air, land, water, biodiversity, natural resources, and people, from natural and man-made disasters that might contribute to instability and conflict" (Griffard & Butts, 2002).

These environmental security programs directly contribute to the first two pillars of the National Security Strategy of the United States (2002):

- Assure allies and friends of U.S. steadfastness of purpose and capability to fulfill its security commitments; and
- Dissuade potential adversaries from undertaking policies, programs, or operations that threaten U.S. interests or those of U.S. allies and friends.[1]

The cooperative activities that the United States undertakes with militaries around the world, both in peaceful pursuits and in response to the entire spectrum of contingencies, helps assure allies and dissuade adversaries.

These activities are particularly important in the Gulf, where, according to Curtis Bowling (2002), the principal assistant deputy under

U.S. Army Sgt. Kornelia Rachwal gives a young Pakistani girl a drink of water as they are airlifted from Muzaffarabad to Islamabad, Pakistan, aboard a U.S. Army CH-47 Chinook helicopter on Oct. 19, 2005. Credit: U.S. Air Force Tech. Sgt. Mike Buytas (Courtesy of U.S. Central Command)

secretary of defense for installations and environment, "environmental security of this region is essential to the continued developmental capacity of much of the world" (page 14). Oil spills, water shortages, earthquakes, and desertification are only some of the potential environmental threats to the region's security, but multilateral and regional efforts to address these problems could help build bridges between nations. As Douglas Campbell (2002) of the U.S. Army War College states, environmental security cooperation is "important to U.S. strategy in the region…and offers a valuable venue for regional security cooperation" (page v).

U.S. Military Operations and Environmental Security

U.S. military operations, both in peace and in war, are conducted by nine four-star combatant commanders in command of joint land, sea, and air forces from all of the services. Five of the commanders are responsible for specific geographic regions, while the others have functional responsibilities.[2] All of these commanders must be attuned to environmental issues, such as the impact of the environment on their installations and operations (and vice versa). But the geographic combatant commanders have been, over the last decade or so, most involved in environmental security, as their responsibilities require planning, training, and conducting contingency operations ranging from the "low end," such as humanitarian assistance, to the "high end" of combat.

Environmental issues—mainly in the form of natural disasters—often cause low-end contingencies, as U.S. forces are called upon to assist in the relief efforts. While military forces are rarely in charge of providing relief, they contribute organized, disciplined manpower; critical supplies and equipment; transportation; and the command, control, and communications required to coordinate relief activities. Environmental issues can also have a broader impact on security, according to Bowling (2002):

> Environmental problems can be exacerbated by natural or man-made events that contribute to regional instability and conflict. Failure to respond to these events in a coordinated, timely, and efficient manner can impact a government's ability to govern and to function…. Environmental degradation from these disasters can also hinder economic development, displace populations, facilitate the growth of undesirable elements, and, potentially, increase proliferation of the threat of weapons of mass destruction. (page 11)

The Theater Security Cooperation Program

The Secretary of Defense and the geographic combatant commanders increasingly recognize the need to prepare in advance for relief and assistance operations. The Theater Security Cooperation (TSC) program, which grew out of the late 1990s Theater Engagement Plans (TEP), improves focus on national, regional, and global security issues; improves coordination across the commanders' geographic

boundaries; and prioritizes activities according to U.S. interests. As the United States Southern Command (USSOUTHCOM), responsible for Latin America, states succinctly, "USSOUTHCOM conducts Theater Security Cooperation to build military-to-military relationships, develop partner nation security force capabilities and professionalism, and afford U.S. forces with peacetime and contingency access to support training and military operations in order to advance U.S. security interests."[3] While the armed forces have always planned and trained for operations across the entire spectrum of possible contingencies, planning for peacetime activities was not as detailed, integrated, or consistent before TSC.

U.S. Central Command's Environmental Security Programs in the Gulf

When U.S. Central Command (USCENTCOM)—which is responsible for 27 countries encompassing the Horn of Africa, the Middle East (excluding Israel), Central Asia, and parts of South Asia—first authored its theater engagement plan in 1997-1998, the command—headed by General Anthony Zinni—developed an environmental security program as a way to improve cooperation with other militaries.[4] Conferences held in 2000 established standing regional environmental security organizations in two of the command's four sub-regions, the Persian Gulf and Central Asia. The Gulf nations focused on water, energy, and potential natural disasters, while the Central Asian countries focused on earthquakes and the environmental legacy of the Soviet era.[5]

The first conference, "Role of the Armed Forces in Environmental Security," held in Muscat, Oman, in 2000, identified major concerns likely to impact military activities in the Gulf, and issued five recommendations for moving forward. The initial sessions were primarily informational, which prompted U.S. and regional leadership to ask what value follow-on work would add. The planners of the next conference faced a significant challenge: how to present a compelling case for the initiative *and* develop a process that would have a high probability for producing a successful product.

Following the attacks of September 11, 2001, their job became a little easier, as it became clear that global enemies would use every tactic at their disposal, including innovative targeting, to degrade and ultimately destroy Western regional interests, including friendly regional regimes. While heavily guarded, for example, sources and distribution nodes for water and energy in the Middle East are vulnerable to attack; disrupting them could have dire consequences. Environmental warfare or terrorism could include attacking the vital desalinization plants in the Persian Gulf, or—even worse—using oil or liquefied natural gas (LNG) supertankers as weapons of mass destruction against population centers.

In 2002, the Gulf nations' second conference, "Environmental Security Planning, Prevention, and Disaster Response in the Arabian Gulf Region," hosted by the Qatar Armed Forces in Doha, sought to move from gathering information to producing results.[6] The second meeting had three goals:

- Encourage the countries of the region to assume ownership of the initiative, with the United States moving to a supporting role;
- Identify the major actions required to establish a standing organization; and
- Develop a process to maintain momentum between major meetings and during times when other events and priorities might divert attention from the program.

To facilitate regional ownership of the program, the informational sessions of the conference used fewer U.S. and Western subject matter experts. More importantly, an executive committee—comprising a general from each participating nation—was formed to receive the reports of functional working groups, to oversee progress toward agreed-upon objectives between the major meetings, and to provide

U.S. Navy crew carry an injured, stranded Indonesian woman to a helicopter that will transport her to a nearby medical center (Indian Ocean, Jan. 3, 2005). Credit: Mate Third Class (AW) Gabriel Piper (Courtesy of U.S. Pacific Command)

ongoing progress reports to each country's senior military officer (usually the armed forces' chief of staff).

At the conference, working groups—composed of officers in the ranks of captain through colonel—addressed five functional areas:

- Defining environmental security and setting regional approaches;
- Environmental security intelligence, detection, and information sharing;
- Regional center/command and control;
- Regional training and exercises; and
- Managing health and disease consequences.[7]

The senior military leaders of all of the countries involved were personally invited by the leader of U.S. Central Command (General Tommy Franks at the time) to receive the reports of the working groups and the executive committee at the conference's final session. Each committee summarized its findings and recommendations for the way forward, which included the establishment of a regional interagency coordination center for preventing and responding to natural and manmade disasters.

From Environmental Security to Disaster Preparedness

After the second conference, USCENTCOM's environmental security initiative was renamed "disaster preparedness" and refocused on manmade disasters. Manmade disasters may result from accidents, or from terrorism or war. Accidents could, for example, include oil spills in the Gulf, refinery explosions, or hazardous material spills in population centers. Terrorists or combatants might attack environmental targets (for example, desalinization plants or refineries) or even use the environment as a weapon (for example, poisoning the food supply). In any terrorism or combat event, the potential for collateral environmental damage is high—and could be exacerbated by the use of chemical, biological, radiological, or nuclear weapons.

Despite the name change, the same process for moving toward regional cooperation remains in place. Hosted by the Bahrain Defense Forces in September 2004, the third major conference, "Gulf Region Disaster Response Preparedness Conference and Medical Workshop" focused on building on the efforts of previous conferences to enhance disaster preparedness and medical surveillance capabilities in the region. "Disaster preparedness is the conduct of civil-military activities to improve host nations' national and regional capabilities to effectively prevent, prepare for, respond to, and/or mitigate the effects of manmade and natural disasters," according to the conference report (Moeller, Sigler, & Griffard, 2004, page 3).

Participating nations laid the groundwork for a permanent organization and headquarters (which may be actual and/or virtual). They agreed that a regional organization will explore ways to prevent disasters and, should prevention fail, coordinate a rapid response. Each nation will dedicate a small standing cadre of personnel to staff the center and augment this group with pre-identified people as required. Once established, the center will likely act as a clearinghouse for long-term environmental sustainability, but it will initially focus on potential regional environmental disasters. A

current database of capabilities and assets that can be brought to bear for a specific contingency is key to this effort. As the conference report concluded:

> The improved national coordination and information-sharing capabilities identified by the participants demonstrate a commitment to strengthening regional cooperation and coordination capabilities. With the proposed USCENTCOM five-year program the GCC states, Egypt, and Jordan have a roadmap that increases security and stability through effective national and regional civil-military coordination and "full spectrum" disaster preparedness. (Moeller, Sigler, & Griffard, 2004, page 4)

Environmental Security and Disaster Response: The Tsunami Example

U.S. forces reacted within minutes to the Indian Ocean tsunami disaster in December 2004, delivering critical supplies to Indonesia, Sri Lanka, and Thailand within 96 hours. Over the next three months some 16,000 U.S. military personnel from the Pacific Command provided assistance with 26 ships, 58 helicopters, and 43 fixed-wing aircraft (U.S. Pacific Command, 2005). They delivered nearly half a million gallons of water, 10 million pounds of food, 3,000 tons of supplies, and significant medical services, including the thousand-bed hospital ship, USNS Mercy. Using both pre-established and ad-hoc arrangements, Pacific Command also coordinated the relief efforts of 19 other nations, which together with the United States contributed 127 ships, 161 helicopters, and 137 fixed-wing aircraft. Finally, and most significantly, the military closely coordinated their efforts with multiple agencies of the U.S. and foreign governments, as well as more than 200 NGOs.

While the scope of the tsunami relief effort was unusual, providing humanitarian assistance and disaster relief are not uncommon tasks for the U.S. military, which experiences a major event every 2-4 years and many minor operations (2005 has been abnormal, with three major disasters and several more approaching major status). Although these may be "low-end" contingencies, successful execution of these missions is both complex and essential to U.S. national security.

The contributions of these relief operations to U.S. security interests cannot be overstated. American national values are on display, offsetting negative perceptions of the "hyperpower" and promoting positive views of the United States and other western nations, which could help reduce global terrorism. For example, the Pew Global Attitudes Project (2005) found that 79 percent of Indonesians have a more favorable view of the United States as a result of the tsunami relief efforts. Further, cooperating with other national militaries can enhance their professional contribution to their societies, improve their ability to operate multilaterally in higher-end contingencies, and could facilitate access to assets that support vital U.S. security interests.

Environmental Security: A Proven Tool for the Future

Environmental security has already proven to be a useful tool for the U.S. military. The conferences held by U.S. Central Command in Central Asia to address earthquakes and Soviet-era environmental legacies fostered increased understanding and cooperation in the region, which were instrumental in persuading Uzbekistan and Kyrgyzstan to allow essential U.S. military bases during Operations Enduring Freedom and Iraqi Liberation. In the Gulf, where "uninterrupted access to and use of critical infrastructure in the Arabian Gulf region are key to the successful prosecution of the Global War on Terror," disaster preparedness initiatives are using regional cooperation to protect this access (Moeller, Sigler, & Griffard, 2004, page 1).

In 2001, General Tommy R. Franks, then commander of U. S. Central Command, told the House Armed Services Committee in a prepared statement:[8]

Oil spills, water shortages, earthquakes, and desertification are only some of the potential environmental threats to the region's security, but multilateral and regional efforts to address these problems could help build bridges between nations.

> While environmental factors can easily trigger conflict, cooperation on these issues can promote regional stability and contribute to the ongoing process of conflict resolution. As such, environmental security remains an important element in shaping a future made complex by competition over natural resources. USCENTCOM-sponsored environmental conferences will continue to provide a valuable forum for the region to discuss environmental issues.

Military commands have not typically been charged with examining the causal linkages of environment and conflict, but rather with dealing with the consequences of environmental degradation.[9] General Franks—like General Zinni before him—recognized the linkage, but saw environmental security as an additional means to achieve better cooperation among regional militaries, other government agencies, and NGOs. Because all agencies, including militaries, view conflict prevention as a far better use of constrained resources than conflict mitigation, mechanisms for facilitating cooperative responses to disasters will likely extend to cooperative programs for preventing environmental problems (or the "root causes"). For the same reasons that militaries are well-equipped to respond to environmental disasters (organization, effective command and control, disciplined manpower, heavy equipment, and transportation) they can—and in the future, I believe, will—be used to mitigate existing environmental damage and prevent future degradation.

While environmental security is a valid military mission, it is also less threatening than preparing for combat, for example. Thus, it can be a useful tool for encouraging cooperation with and between "frictional" nations. For example, cooperative regimes govern shared water resources between Israel and Jordan and between India and Pakistan. This cooperation should be an element of campaigns to dissuade threatening policies or behaviors. Finally, broader environmental security programs could indirectly contribute to the U.S. national security strategy, because U.S. forces may well have to operate where the environment is the greatest challenge—or even the weapon of the enemy's choice.

Conclusion

2005 has been a particularly bad year for environmental disasters. Militaries around the world have responded to them alongside other agencies and relief organizations. If some forecasters are correct, this is merely a harbinger of more to come. Those who work routinely on the broad range of issues that fall under the rubric of environmental security know that a large number of environmental issues may lead to conflict or disaster, and they know that the right efforts now could prevent a significant number of those events. Militaries around the world are starting to understand the potential of the prevention side of the equation. The U.S. military's environmental security programs are steps in the right direction.

Notes

1. The other two pillars of the United States' National Security Strategy are: deter aggression against the United States or U.S. allies and friends through the capability and demonstrated will to impose severe penalties for such aggression; and decisively defeat any adversary, should deterrence fail. For the complete strategy, see http://www.state.gov/r/pa/ei/wh/c7889.htm

2. The nine combatant commanders are comprised of two generals each from the Army, Air Force, and Marine Corps, plus three Navy admirals. All report directly to the Secretary of Defense.

3. See the USSOUTHCOM Theater Security Cooperation mission statement at: http://www.southcom.mil/tscmis/TSCMIS.asp. For more on USSOUTHCOM's environmental security program, see Butts, Sonski, and Reynolds (2005).

4. A second cooperative program focused on developing a shared early warning network for the nations of the Gulf Cooperation Council (GCC) plus two others. This simple civil defense system would warn if a ballistic or cruise missile was launched by another nation in the region. Since the intended target is the least likely to detect the incoming missile—neighbor-

ing nations have a better chance of recognizing the missile's profile—a mechanism that can rapidly convey the information across national borders would deliver the warning before it was too late.

5. For more on the conferences in Central Asia, see Reynolds and Butts (2002).

6. For an excellent executive summary and detailed report on this meeting, please see Butts et al. (2002), which is available at online at http://www.carlisle.army.mil/usacsl/Publications/ESAG1ETOC.htm

7. The medical surveillance group was added during the workshop.

8. From General Tommy R. Franks' prepared statement, submitted prior to testifying before the House Armed Services Committee, 107th Congress, March 28, 2001. Available online at http://www.house.gov/hasc/openingstatements andpressreleases/107thcongress/01-03-28franks.html

9. An exception is the U.S. Army Corps of Engineers, which routinely assesses the environmental impact of its projects.

Flown in from Japan to aid in tsunami relief, U.S. air force crewmembers hand off boxes of water to Thai military officers at Phuket Airport (Thailand, Dec. 31, 2004). Credit: Sgt. Cohen A. Young (Courtesy of U.S. Pacific Command)

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PREVIEW

Parks for Peace or Peace for Parks? Issues in Practice and Policy
A Forthcoming Publication From ECSP

Introduction

In 2001, Nelson Mandela said, "I know of no political movement, no philosophy, no ideology, which does not agree with the peace parks concept as we see it going into fruition today. It is a concept that can be embraced by all."[1] Parks for peace—transboundary conservation areas dedicated to the promotion of peace and cooperation—hold great promise and appeal, but have they lived up to this promise? Some say yes, others respectfully disagree with the former South African President's assertion.

Even the definition of peace parks—sometimes called "transboundary natural resource management" (TBNRM) or "transboundary conservation" initiatives—is subject to debate. The lack of a consistent and agreed-upon typology often leads to confusion and hinders international discussions and legal agreements. Other problems have emerged in practice; for example, the implementation of some TBRNM initiatives in southern Africa engendered conflict when the new parks evicted or excluded residents. Proposals for future parks offer innovative approaches to resolving decades-long conflicts, but some doubt the chances that such environmental conservation initiatives can help create peace.

An upcoming ECSP publication—based on a conference held in September 2005 at the Wilson Center[2]—will explore the rhetoric and reality of peace parks, including their goals and the factors that determine their success or failure. Drawing on future plans and successful projects in southern Africa, Kashmir, and South America, the authors debate whether peace parks can protect the environment and promote conflict resolution. *ECSP Report* presents excerpts from five of the conference papers as a preview of the publication forthcoming in 2006; complete versions are available on ECSP's website at www.wilsoncenter.org/ecsp.

While the debate over peace parks and transboundary areas will continue for some time, Dorothy Zbicz, an international conservation policy consultant who attended the September conference, provided an example of how transboundary resource management can lead to grand results. Resting on the Virginia and Maryland sides of the Potomac River, Great Falls Park is the historic site where two states built a canal around the region's impassable waterfalls and rapids. This early act of American cooperation is noted on the park's plaque: "The agreement that was developed between Maryland and Virginia to share the river for their common purpose led to further meetings—Annapolis 1786 and Philadelphia 1787 and to drafting of the United States Constitution." Today, while Great Falls Park is no longer building democracy, it stands as a memorial to the power of managing environmental resources for peace.

Notes

1. The full text of Nelon Mandela's October 21, 2001, speech is available online at http://www.game-rangers.com/left_frameset/05_nieuws/01_natuur/sub2_frameset_bestanden/natuur.html#speech

2. A summary of the September 12, 2005, conference is available on ECSP's website at http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.event_summary&event_id=146506

Conservation and Conflict Resolution: Crossing the Policy Frontier

By Saleem H. Ali

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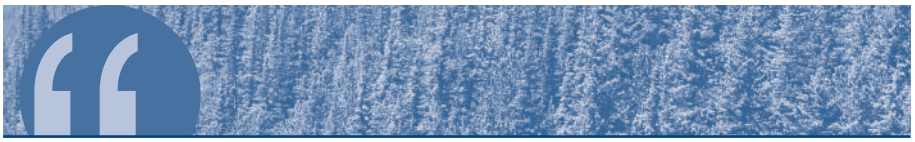
International conservation efforts are generally relegated to specific government agencies and scientists, and are not linked to issues of regional cooperation between adversarial states or communities. Thus, a "policy frontier" separates conservation initiatives from foreign policy or intra-state community relations. While environmental security theorists have tried over the years to inject the importance of resource scarcity and quality into defense circles, the empirical focus on conflict causality has led to the decline of this influence.

Instead of trying to tease out environmental causality in conflicts and thereby accentuate the importance of conservation, we could also look at how environmental issues play a role in cooperation—regardless of whether they were part of the original conflict. Scholars have only recently begun to examine the utility of this approach, which is termed "environmental peacemaking" (Conca & Dabelko, 2002). The main premise of environmental peacemaking holds that certain key attributes of environmental concerns could lead acrimonious parties to consider them as a means of cooperation.

Using conservation as a direct means of conflict resolution challenges conventional assumptions about the secondary role of environmental issues in conflict resolution. For example, peace parks are being actively pursued in Korea and Kashmir, two high-conflict areas. Since 1986, the Siachen glacier in Kashmir has served as a battleground for India and Pakistan. More than 100 million people depend on the meltwater of the Himalayan glaciers, increasing the human security dimensions of this issue in both adversarial countries (Ali, 2005). Anticipating water shortages requires studying the glaciers' retreat in the face of climatic changes. Given the importance of this work, the Kashmir park planners have focused on using science as a peacebuilding tool.

Geologists and hydrologists from India and Pakistan, with help from colleagues at the National Science Foundation in the United States and Italy, have appealed to the governments to give them access to this region. Environmentalists and mountaineers have joined forces to use this opportunity to establish a conservation zone. The Indian prime minister, Dr. Manmohan Singh, gave the idea its most significant political support during his visit to Siachen in June 2005, during which he publicly remarked that the territory could become a "peace mountain." Strategies for



Peace parks constitute a new vision for addressing global conflicts and hence will suffer growing pains before reaching cognitive acceptance and practical results.

de-escalating the Siachen conflict continue, including a project supported by Sandia National Labs in New Mexico involving Pakistani and Indian military officials.

In the Korean case, the demilitarized zone (DMZ) has become a default sanctuary for wildlife since conflict has prevented the area's development.[1] Several conservation biologists have suggested using the region's high biodiversity to develop a conflict resolution strategy between the two countries. An organization called the DMZ Forum, established in the United States in 1998, has lobbied for this proposal's inclusion in the six-party talks. Media magnate Ted Turner has popularized this effort, most recently during his visit to both North and South Korea in August 2005.

Recommendations

For proper implementation, the peace park effort must first undergo a phase of local review and transparency. A clear process is particularly important in conflict settings to avoid the spread of conspiracy theories that can lead to suspicion and rumor-mongering, which often spoil even the most sincere efforts.

In addition, the military should be considered a facilitator rather than a hindrance. Demilitarization might not be the first step, but transforming the military into a ranger force could assuage security and employment concerns while accomplishing conservation tasks. If the conflict has caused environmental damage, the military can certainly play an important role in the clean-up effort.

The positive economic impact of peace park formulation is often quantifiable, based on the potential for increased tourism as well as the willingness of donors to invest in such a program. Integrated planning for peace parks must include a clear assessment of livelihoods and how those would be made sustainable by the development of a peace park. The incorporation of conservation provisions and access to peace park areas through visa waivers or on-site processing of visas for the conservation zones can also be proposed.

As with many complex interactions of human behavior and the environment, we must not expect instant solutions. Peace parks constitute a new vision for addressing global conflicts and hence will suffer growing pains before reaching cognitive acceptance and practical results. However, there is substantive theoretical backing for their efficacy as well as emerging examples of their success, which we should view with optimism.

Note

1. Ke Chung Kim, professor of entomology at Pennsylvania State University, discussed the DMZ peace park proposal at the ECSP conference. His presentation, "Biodiversity and Barbed Wire: Exploring Joint Conservation in the Korea DMZ," is available on ECSP's website at http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.event_summary&event_id=146506

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Trade-offs Among Multiple Goals for Transboundary Conservation

By Trevor Sandwith and Charles Besançon

During the past 50-80 years, the number and complexity of formalized transboundary natural resource management arrangements and agreements between countries have increased, particularly for key shared resources such as water and fisheries.

Such arrangements have also grown where protected areas are adjacent and cross an international boundary. At least 188 transboundary conservation areas, spanning the borders of 122 countries, have followed the declaration of the Waterton-Glacier International Peace Park in 1932 (Besançon & Savy, 2005). This grand-scale experiment reflects a range of methods of implementation, expression, and objectives. This makes it difficult to define "transboundary conservation" precisely, and identify how best to undertake it.

We propose the following typology as an organizing framework for transboundary conservation and development initiatives.

1. Transboundary protected areas: A transboundary protected area is an area of land and/or sea that straddles one or more borders between states, sub-national units such as provinces and regions, autonomous areas, and/or areas beyond the limit of national sovereignty or jurisdiction, whose constituent parts are especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed cooperatively through legal or other effective means (Sandwith et al., 2001).

Examples: La Ámistad International Park between Costa Rica and Panama; Kgalagadi Transfrontier Park between Botswana and South Africa; and Neusiedler See/Seewinkel - Fertö Hansag Transfrontier Park between Austria and Hungary.

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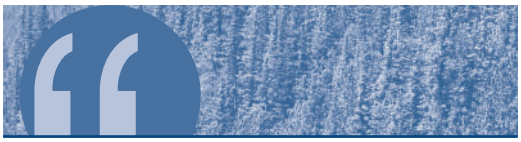
2. Transboundary conservation and development areas: Transboundary conservation (and development) areas are areas of land and/or sea that straddle one or more borders between states, sub-national units such as provinces and regions, autonomous areas, and/or areas beyond the limit of national sovereignty or jurisdiction, *whose constituent parts form a matrix* that contributes to the protection and maintenance of biological diversity, and of natural and associated cultural resources, *as well as the promotion of social and economic development,* and which are managed cooperatively through legal or other effective means.

Examples: Maloti-Drakensberg Transfrontier Conservation and Development Area (Lesotho-South Africa); the Palatinate Forest Nature Park–Northern Vosges Regional Natural Park (Germany-France); and Sungai Kayan Nature Reserve and the proposed Pulong Tau National Park (Indonesia-Malaysia).

3. Parks for Peace: Parks for Peace are transboundary protected areas that are formally dedicated to the protection and maintenance of



While some dismiss this as an unnecessary exercise in "splitting hairs," the continued use of a range of terms could engender an uncooperative response to transboundary conservation.

biological diversity, and of natural and associated cultural resources, and to the promotion of peace and cooperation (Sandwith et al., 2001).

Examples: Si-a-Paz project (Costa Rica–Nicaragua); the Cordillera del Cóndor projects in Ecuador and Peru; and Waterton-Glacier International Peace Park (Canada–USA).

4. Transboundary migratory corridors:

Transboundary migratory corridors are areas of land and/or sea in two or more countries that are not necessarily contiguous, but are required to sustain a biological migratory pathway, and where cooperative management has been secured through legal or other effective means.

Examples: Palearctic Flyway (Siberia to Senegal); European Green Belt; and the Mesoamerican Corridor.

Recommendations

Transboundary conservation initiatives have captured the imagination of many. They represent an ideal whereby conservation can deliver more than simply biodiversity, species, and habitat protection, but also sustainable development and the promotion of a culture of peace and cooperation. But the question remains whether this assertion is valid, whether the methods currently being employed are optimal in relation to the investment and transaction costs of such initiatives, and whether the enthusiasm for implementation overlooks the emergent and unforeseen consequences. We call for a more deliberate process of reflection and analysis that disaggregates objectives, methods, and impacts.

In particular, we draw your attention to the need to standardize terminology as an aid for comparative analysis and to apply innovative methods to measure impacts of different types. While some dismiss this as an unnecessary exercise in "splitting hairs," the continued use of a range of terms could engender an uncooperative response to transboundary conservation. These suggestions from the IUCN/WCPA Transboundary Conservation Task Force are consequently offered as a way to clarify the issues and circumstances in an effort to encourage cooperation.

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Peace Parks in the Cordillera del Cóndor Mountain Range and Biodiversity Conservation Corridor

By Martín Alcalde, Carlos F. Ponce, and Yanitza Curonisy

For more than 150 years after independence from Spanish rule, the border of Perú and Ecuador witnessed territorial conflict initiated by both countries. In 1998, after intense negotiation and the intervention of other countries (Argentina, Brazil, Chile, and the United States), a final agreement—the Acta Presidencial de Brasilia—was signed, finally resolving the border conflicts between the two countries. The agreement recognized the need to update and improve existing mechanisms to promote bilateral cooperation and integration between Perú and Ecuador. Likewise, it emphasized that such mechanisms must lead to economic and social development and strengthen the cultural identity of native populations, as well as aid the conservation of biological biodiversity and the sustainable use of the ecosystems of the common border.

There have been several attempts by the conservation community to find ways to preserve the exceptional biodiversity of the Cordillera del Cóndor, a relatively isolated mountain range that straddles the Perú-Ecuador border. The cordillera lies in a highly significant global conservation zone: thanks to an abundance of water throughout the year, the region hosts the world's most diverse plant communities and serves as a key element in the great hydrological cycle linking the Andes with the Amazon.

However, only the Acta Presidencial de Brasilia brought bilateral cooperation and a peaceful environment for conservation to both countries. The Peace Agreement officially established two protected zones governed by the same treaty. These new Ecological Protection Areas include the 2,540-hectare "El Cóndor" in Ecuador. In Perú, in addition to the 5,440-hectare Ecological Protection Area, the Peruvian government established the Santiago-Comaina Reserved Area, with a surface area of 1,642,570 hectares.

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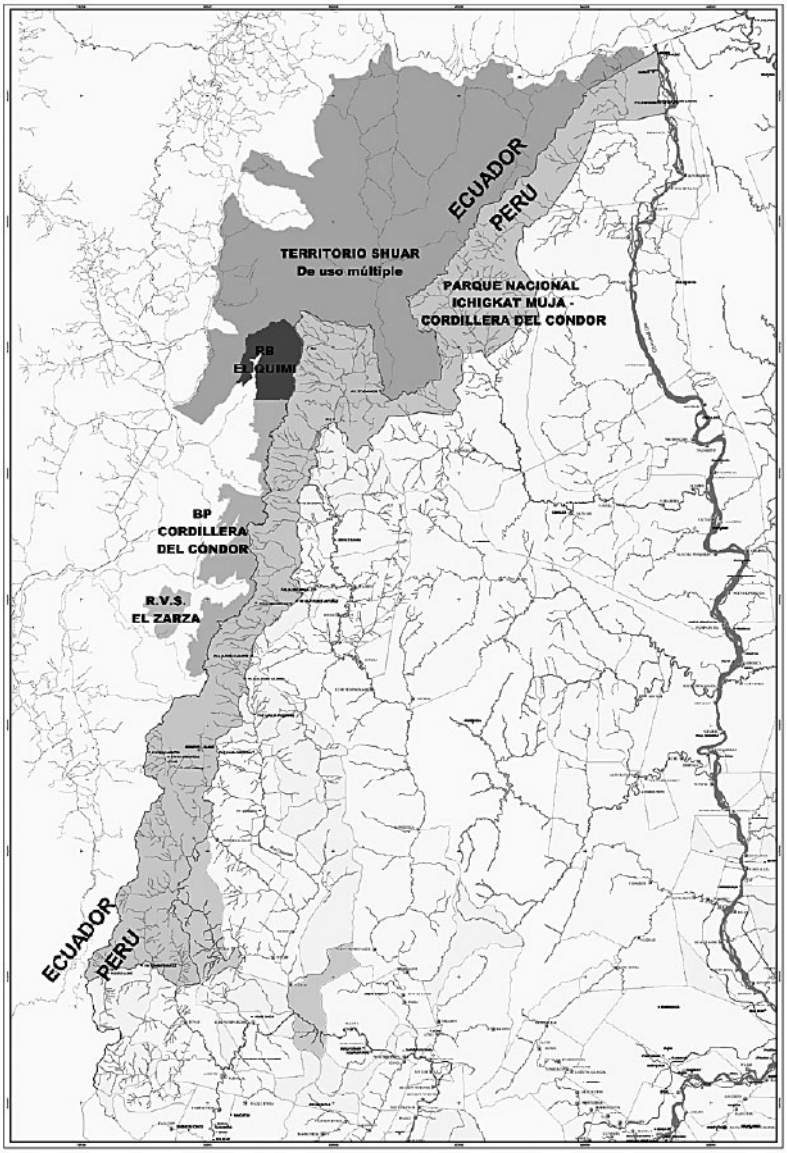
These actions created a space for cooperation between both countries. For the "Peace and Bi-national Conservation in the Cordillera del Cóndor, Ecuador-Perú" project, between 2002 and 2004, a group of Peruvian and Ecuadorian specialists jointly prepared proposals and designed a planning and implementing process. Both countries formulated proposals for the establishment of Bordering Protected Areas on either side the border. And together, Peruvian and Ecuadorian experts helped identify the threats to conservation on both sides of the border. Management plans included actions necessary to mitigate such threats, emphasizing the continuous, coordinated management of bordering protected areas; joint investigation proposals; knowledge exchange among protected area managers; and coordinated monitoring of the biodiversity in both countries (Sandwith et al., 2001).

The peace agreement and the conservation efforts to date have helped create an environment for long-lasting peace in the region. The agreement has helped reestablish centuries-old relationships among the indigenous populations living in the zone, and improved relationships between the states and between the professionals from both countries who work together to conserve this exceptional biological richness.

The protected areas—those already established and those yet to be created—on both sides of the Peruvian-Ecuadorian border help conserve the ecosystems shared by the countries. The

Protected Areas and Ecological Protection Zones in the Cordillera del Cóndor Region



Source: Conservación Internacional, CI - Perú 2005.

Ecuador
Protected Areas (proposed): Ecological Reserve: "El Quimi" (9,266 hectares) Wildlife Shelter: "El Zarza" (3,743 hectares)
Ecological Protection Zone: "Parque El Cóndor" (approx. 2,540 hectares)
Peru
Protected Areas (proposed): National Park Ichigkat Muja: Cordillera del Cóndor (approx. 150,000 hectares)
Ecological Protection Zone: (approx. 5,440 hectares)

successful coordination and cooperation that takes place beyond the frontiers highlight how border protected areas act as real "links" connecting peace and conservation.

Recommendations

These efforts have set the stage for progress in the development of the Cóndor-Kutukú Conservation Corridor (part of a Conservation International initiative to link protected areas in the Tropical Andes hotspot). For this to be successful, we believe it is necessary to:

- Strengthen the planning processes and consolidate a bi-national vision;
- Promote a bi-national information network between protected areas within the Cóndor-Kutukú Conservation Corridor;
- Generate social, economic, and biodiversity data to help prioritize conservation actions and sustainable development; and
- Encourage a participatory process for the Cóndor-Kutukú Conservation Corridor, to spread the concept of conservation corridors and promote the development of a planning process for a bi-national strategy.

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Peace Parks in Southern Africa

by Larry A. Swatuk

Transboundary Natural Resource Management (TBNRM) initiatives, such as "peace parks," abound throughout southern and eastern Africa. Although a good idea in theory, TBNRM in general—and peace parks in particular—must reflexively consider their motives, methods, and hypothesized outcomes to be successful. Failure to do so will result in limited buy-in at all levels of stakeholder involvement.

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Issues to Consider

1. Peace parks must be set within local political ecology: At a theoretical level, peace parks are an indisputably good idea. But at the level of implementation, one must be willing to adapt a generic model to highly specific local and regional political ecologies—perhaps even to recognize that the peace park approach will not work. As physical symbols of land alienation and exclusion, national parks have long been an object of derision by the majority of Africa's rural people (Grove, 1997; Koch, 1998). Linking them together by obtaining more land will surely result in political difficulties; land claims lodged by South African communities forcibly removed from Kruger and Richtersveld National Parks are the examples cited most often (Fig, 1991; Swatuk, 2005a; *Umhlaba Wethu*, 2005; Wolmer, 2003).

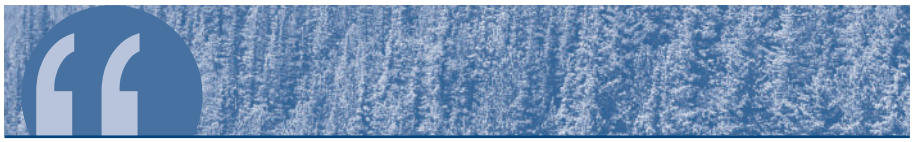
2. Peace parks cannot be considered separately from other conservation activities and their results: Various INGOs have undertaken the responsibility of preserving biodiversity and empowering communities through the establishment of Community-Based Natural Resources Management (CBNRM) projects (Fabricius & Koch, 2005). Many have deliberately attempted to begin at the village level and only involve the state when necessary and/or unavoidable. However, where projects involve state-owned resources such as wildlife, challenge existing forms of land tenure, or could truly empower local people (such that they are no longer dependent on central government for survival), the state invariably gets involved, often in an obstructive way (Swatuk, 2005a). Simply because it is easier to deal with educated elites at a high level of government does not mean that the outcome—peace park establishment—will be any less fraught with conflict and failure than other attempts at linking conservation to rural development. Thus, one (TBNRM) is not a substitute for the other (CBNRM).

3. Peace parks cannot be de-linked from national/regional development strategies/priorities: Those interested in biodiversity preservation must recognize that southern African leaders' support for TBNRM initiatives may have different roots and goals, such as achieving economies of scale and global advantage in megafauna-based tourism to generate revenue and economic development. These goals may only tangentially relate to perceived global environmental goods.

Recommendations

Five suggestions may help lead the way over the hurdles facing peace parks:

1. Assess what has been achieved thus far. An accurate assessment will only emerge where we dispense with naïve or arrogant approaches to conservation and biodiversity preservation. However, as Chapin (2004)



An accurate assessment will only emerge where we dispense with naïve or arrogant approaches to conservation and biodiversity preservation.

suggests, humility is in short supply among the global purveyors of "conservation."

2. Put people first: Following Child (2004), the goals of TBNRM must be set and aligned with those of national parks, game reserves, and other forms of protected area in southern Africa. This means putting people first and making social/economic benefits the primary motivating factor in TBNRM processes and establishment—and putting conservation second. This, too, may be a pill too bitter for conservationists to swallow.

3. Get local level buy-in: TBNRM by definition privileges the central state and its machinery in the negotiation and management process. While it may be easier to deal with centralized agencies, supporters of TBNRM must press for subsidiarity. Without local level buy-in, TBNRM will fail.

4. Monitor and benchmark: As highlighted by Murphree (2004), the potential benefits from parks are numerous, and cut across economic, ecological, political, and socio-cultural lines. But there has been little systematic information gathered on the performance of protected areas of all kinds. If stakeholders across the spectrum are expected to buy into it, TBNRM must build in mechanisms for monitoring (e.g., biodiversity preservation, economic development, and gender empowerment) and benchmarking (e.g., "by this point we will have created X number of jobs"), as well as the financial means to do so. Claims of "numerous" benefits are not enough.

5. Do not exaggerate achievements. Many claims regarding the achievements of TBNRM projects in southern Africa are not true. States are very good at signing, and even ratifying into law, a wide variety of documents; implementation, however, is another matter altogether. Evidence from river basin committee development in southern Africa suggests that where states have rushed ahead with donors' good ideas, little has been achieved; but where communities have been involved from the start, where government has been brought in as a key stakeholder, and where timelines are medium-term, new, sustainable, and meaningful institutions may emerge (Swatuk, 2005b; Manning & Seely, 2005). This is an appropriate lesson for supporters of peace parks—a good idea whose time may yet still come.

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Global Politics and Peace Parks

by Rosaleen Duffy

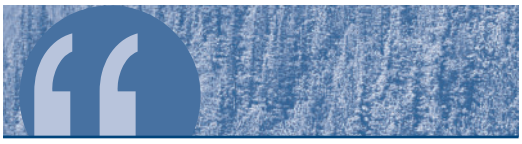
Rosaleen Duffy is a senior lecturer in the Centre for International Politics at Manchester University.

Nowhere is the need for transnational forms of management more apparent than in the realm of the environment. Natural resources—such as marine life, wildlife, the atmosphere, and the ozone layer—are not bounded by national borders, and thus, effective conservation requires international cooperation. The growing interest in peace parks reflects this need. Briefly defined, peace parks are conservation areas that cross one or more international borders and use common management practices to conserve a single transnational ecosystem. Peace parks are not simply neutral, technical policies, however. They have not developed in a social, political, and economic vacuum; instead, they reflect wider changes in the global system since the end of the Cold War. Increasing levels of globalization have led to growing global regulation, which is often referred to as "global governance."

I suggest that peace parks, like global governance, do not represent a radical new departure for conservation; instead, peace parks operate within the existing framework of political and economic liberalization, and, as such, they do not challenge it. Furthermore, if we regard the expansion of neoliberalism as causing or contributing to global environmental degradation, then peace parks cannot "save" the environment. Instead, peace parks can only hope to achieve small successes in the realm of environmental conservation and peacebuilding that impose costs for some and bring benefits for others.

Ecosystems have often been separated by "artificial" national political boundaries, and peace parks seek to restore ecosystem connections through common management policies. However, Neumann (2000) argues that such scientific justifications for global conservation strategies tend to gloss over the magnitude of political change involved, and instead invest international conservation groups and states with increased authority over resources and, often, over local communities. The failure to recognize the level of political change required and to anticipate community responses to new forms of control over natural resources by external agencies (e.g., NGOs, IFIs, transnational management authorities) can affect the long-term implementation of peace parks.

Peace park supporters have consistently argued that they have a neoliberal, market-



The needs and political power of communities can be severely undermined through their participation in transboundary conservation schemes that incorporate a number of globally powerful actors.

oriented economic rationale in the form of tourism (especially ecotourism). However, the promotion of tourism as a way to financially sustain conservation is a misplaced effort (Duffy, 2005). For example, local communities that subsist on the resources held within the new peace parks may be asked to relinquish such user rights in return for promises that tourism will bring more revenue. Yet, new tourism ventures often take a number of years to become financially viable, and this is simply too long for many poor communities to wait. In addition, the revenues, profits, and employment opportunities from such ventures are not always clearly earmarked for local community use, but instead often end up in the hands of external (and wealthy) tour operators (see Mowforth & Munt, 1998).

Supporters of peace parks see communities as vitally important actors in ensuring that the schemes are socially as well as environmentally sustainable (see Hulme & Murphree, 2001). However, local participation is far from politically neutral and has often helped the dominant economic, political, and social groups within communities further their interests at the expense of others. Furthermore, presenting communities as single units with common interests that support peace parks is a clear oversimplification.

As part of peace park proposals, local communities are expected to enter into complex relations with external agencies, such as local and global NGOs, donors, and IFIs (e.g., the World Bank). Peace parks have attracted enthusiastic financial backing from such organizations. On one hand, the bargaining power of communities can be significantly enhanced through their relationships with international NGOs. On the other hand, the needs and political power of communities can be severely undermined through their participation in transboundary conservation schemes that incorporate a number of globally powerful actors.

Supporters of peace parks have used arguments about national security, environmental security, and conflict resolution to justify these schemes. The World Bank and the Peace Parks Foundation argue that transfrontier conservation encourages regional integration and fosters peaceful cooperation between countries that have been—or may be—engaged in conflict with one another. Peace parks are promoted as a way to reduce or eliminate conflict over natural resources and to cooperatively encourage sustainable economic development. The assumption that peace parks reduce competition over scarce resources, however, needs more refined analysis of peace parks in practice.

Furthermore, peace parks are already "transnationalized" by illicit networks. Peace parks are often proposed for areas that provide key resources for those illegally harvesting flora and fauna for local use or international trade. It is clear that networks utilize weakly enforced borders to traffic arms, drugs, stolen cars, and people, as well as to illegally trade endangered species of plants and animals, such as ivory, rhino horn, rare orchids, furs, and tiger bone. These border regions are often where environmental NGOs, state governments, and local communities look to establish peace parks (Duffy, 2005, in press).

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NEW PUBLICATIONS

Bare Branches: The Security Implications of Asia's Surplus Male Population

Valerie M. Hudson and Andrea M. den Boer
Cambridge, MA: MIT Press, 2004. 400 pages.

Reviewed by RICHARD P. CINCOTTA

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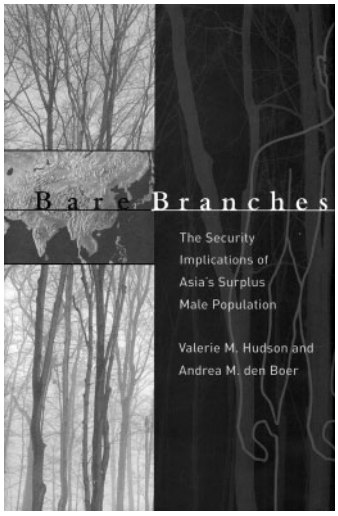


From Ultrasound to Insurgency

Although this review will challenge the authors' predictions, *Bare Branches: The Security Implications of Asia's Surplus Male Population* is an impressively researched work: it is provocative, path-breaking, and deserving of a place in the personal library of all those who consider demographic security issues relevant to contemporary society. Throughout the book, political scientists Valerie Hudson and Andrea den Boer do an admirable job of digging through vital statistics to show the nature and extent of imbalanced sex ratios at birth, assembling historical and contemporary evidence, and making the case that we should take seriously the reports—particularly from China and northern India—of generations approaching marriageable age with an uncommonly large proportion of men.

The authors' thesis is clear from the outset. A large demographic dominance of males, they contend, could directly unsettle Asia's political environment. These women-short generations are destined to cast off millions of "bare branches"—a pre-revolutionary Chinese expression that disdainfully describes young men who do not marry and build a family. In the past, Chinese officials looked upon bare branches with suspicion, portraying these young men as shiftless troublemakers. Because their behavior was not constrained by familial responsibilities and social obligations, bare branches could be easily recruited by dangerous political malcontents and antisocial subcultures, and then cultivated into a military force. On this point, Hudson and den Boer are unwavering: high sex ratios were dangerous in 19th century China, and they still are today.

I am not so certain. Within the authors' neatly forged chain between thesis and validation, I find two weak links. First, they assume that sex ratios at birth—and sometimes sex ratios of entire populations—represent the sex ratio that young marriageable men encounter. I contend that these ratios are not representative, which matters immensely. Second, Hudson and den Boer sift through history to identify the security dimension of these surplus bachelors. But I do not believe that in this case, the historic past is relevant to China or India's future.

Which Sex Ratio?

In *Bare Branches*, Hudson and den Boer convincingly link increases in the sex ratio[1] at birth in China and India (and several other countries) to son preference, expressed in the differences in male and female infant mortality, and

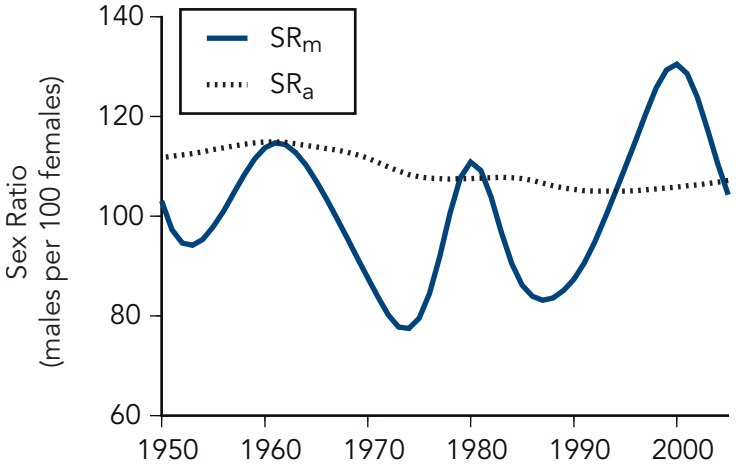
to the increasing practice of sex-selective abortion, which is facilitated by the spread of ultrasound technology. All nationwide surveys in China and India show some regional impact of son preference. A one-percent survey—while not the source of China's official population statistics—estimated the 1995 sex ratio at birth to be nearly 116 males per 100 females (China State Statistical Bureau, 1997). These data suggested an upward trend since 1980 across much of China, particularly in the southern provinces (the sex ratio in Hubei was recorded at 130, Jiangsu at 123, and Fujian at 122). While the 2001 census showed that India's countrywide sex ratio for children under age six had risen to only about 108, it also revealed that the northwestern states of Haryana and Punjab had reached ratios of 122 and 126, respectively.

Hudson and den Boer then connect high sex ratios at birth to the future number of marriageable women available for marriageable men. But is the sex ratio of same-age adults a proper estimate of the supply of mates? In many societies, men delay marriage to obtain skills and accumulate wealth, often wedding women more than five years their junior, which expands the available pool of marriage-age women. Because population has grown through most of history, each female age cohort is larger than the preceding male age cohort—and that makes the available pool of potential female mates exceedingly large.

Using a methodology similar to that used by Daniel Goodkind (2003), I estimate the sex ratio encountered by men preparing for marriage by assuming that it is equal to the number of males, ages 25 to 29, divided by the number of females, ages 20 to 24. I compare this marriage sex ratio to the apparent sex ratio, which is calculated as the number of males, ages 20 to 29, divided by the number of females in the same age group. The results of this comparative analysis (Chart 1) show that China's marriage sex ratio (an effect of age structure) has swung between extreme highs and lows over the past half-century. Although consistently higher than the expected sex ratio for that age group, the amplitude of China's apparent sex ratio has been overshadowed, so far, by these swings, which can be traced to episodes of high mortality (the first two swings) and to declines in fertility (the last swing). In fact, the marriage sex ratio hit low points (representing an abundance of marriage-age women) during the Cultural Revolution (1966-1976) and just before the 1989 Tiananmen Square protests. This suggests that China's "marriage market" is not as inflexible as the authors assert, and that the security effects of a male-skewed sex ratio, at the level currently observed among children (111, according to UN estimates), are insignificant in contemporary Chinese society.

The authors use prior studies of Indian districts that show a correlation between high sex ratios in the entire population and the murder rate. But these population sex ratios, I argue, reflect fertility and age structure (which are linked) as much as the sex ratio at marriageable age. Males typically outnumber females in childhood and adolescence; women tend to die prematurely in high-fertility societies, while women in older, low-fertility populations outlive men by about eight years. Analysis of 2005 data from the UN Population Division shows that median age and population sex ratio are correlated, as are the adult population's proportion of young adults (15-29 years) and population sex ratio.[2] These correlations are consistent with studies that have found that increased vio-

Chart 1: Sex Ratios at Marriage in China, 1950–2004



Note: Variation in rates of child survival and birth in China have caused the sex ratio of marriage-age men (ages 25-29 years) to marriage-age women (20-24), SR_m (or the "marriage sex ratio"), to swing widely while the "apparent sex ratio" of that age group (20-29 years), SR_a, has changed relatively slowly. This suggests that, in recent years, the relative supply of females at marriage age has been more sensitive to age structure than to sex ratios at birth. And, it calls into question expectations of violence from contemporary "bare branches."
Source: United Nations Population Division (2005).

Hudson and den Boer turn to history for further validation, but it yields as much ambiguity as it does proof. Each historical case is confounded by other factors that may boost the risk of conflict.

lent crime often can be statistically explained by an increase in the proportion of young men in the population (Daly & Wilson, 1988).

Is History an Honest Guide?

The authors' presentation of evidence from contemporary comparative psychological and criminal behavior research is fairly strong. Psychological studies have generally found young men to be more aggressive under conditions of sustained sexual isolation, while parallel research has shown that men with mates and familial responsibilities are less likely to be involved in criminal behavior (see Laub et al., 1998).

Hudson and den Boer turn to history for further validation, but it yields as much ambiguity as it does proof. Each historical case is confounded by other factors that may boost the risk of conflict: the instabilities occur in volatile youthful populations (Moller, 1967/68; Mesquida & Wiener, 1999; Fuller, 1995; Goldstone, 1999; Cincotta et al., 2003); the rebels are members of large families and often high birth-order sons (Goldstone, 1991); the young men are landless or otherwise unemployed (Homer-Dixon & Blitt, 1998; Ohlsson, 2000); or there is a state power vacuum, as is often the case in frontier settlements and decaying empires.

No single case demonstrates that a high sex ratio, on its own, is enough to substantially lower the costs of recruiting men for risky coalitional violence. But this is exactly what the authors must show. In China—with which Hudson and den Boer are most concerned—nearly all of the destabilizing demographic, social, and economic conditions that accompanied high sex ratios in the historical case studies have since been systematically peeled away.

Most notably, China's age structure has matured. While the country's median age was likely younger than 18 throughout most of the 19th century, today the median age is 32 years old (United Nations Population Division, 2005). The proportion of young adults ages 15 to 29 years—a measure that has been shown to be positively related to a state's risk of civil conflict (Cincotta et al., 2003)—peaked in the mid-1980s at more than 43 percent. Today, it is 30 percent and falling. Job growth, which has been driven by the past decade's 8 percent annual increase in real GDP, surely outpaces the slowing growth of its working-age population (now at 1.3 percent annually).

Nor are young Chinese men and women still circumscribed by the sexual constraints and occupational limitations of pre-revolution China. Increased rates of divorce and remarriage, the removal of social stigma constraining widows and older women from marriage, declining social restrictions on premarital sexual activity, weakening class structure, bustling urban job markets, and the migration of young Chinese for education and work—all of these are likely to reduce the perception and impact of a high sex ratio by reducing the number of idle young men with low mobility or without familial or employment-related responsibilities.

Turning the Skew

From the first pages of *Bare Branches*, I was curious to see how the authors would navigate the tense politics surrounding sex-selected abortion. But Hudson and den Boer steer clear of this thorny debate. They point out that in China the most cost-effective solution is obvious: removing the one-child policy should substantially depress the demand for sex-selected abortion and could reduce mortality among infant girls.

Dismantling India's ubiquitous and already outlawed dowry system presents a more formidable policy challenge, however. The authors offer several recommendations, the most solid of which advises governments to improve the legal and social status of girls and women, which should reduce the costs of bearing girl children and increase the returns on investments in their health and education (even as technologies facilitating fetal sex determination and selection grow more affordable and available).[3]

Despite my criticisms, I highly recommend *Bare Branches*. Through their research and publications (see also Hudson & den Boer, 2002; den Boer & Hudson, 2004) the authors have sparked a vibrant debate that will undoubtedly claim a significant place in the literature on demographic security. Moreover, their work continues to draw much needed attention to the extent and persistence of discrimination against women.

Notes

1. Demographers assess the degree of numerical balance between human males and females using the "sex ratio," which is calculated as the number of males divided by the number of females, multiplied by 100. For reasons that Hudson and den Boer admit are still poorly understood, the normal sex ratio at birth for a large human population is typically around 105 (105 males per 100 females).

2. I used a two-tailed hypothesis to test statistical significance, where the critical value is F(DF= 184, 184). Both correlations are significant at $p<0.01$. Six outliers, all of them Arabian Gulf countries, were omitted from the analysis because of the presence of an unusually large proportion of male workers in their populations.

3. New technologies are likely to come online; the authors note that companies in the developing world are seeking to license a technology for separating sperm carrying X or Y chromosomes.

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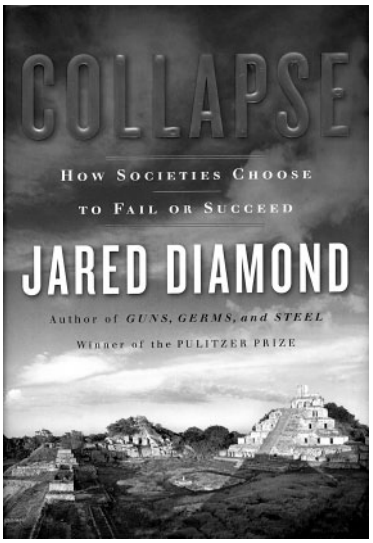
Collapse: How Societies Choose to Fail or Succeed

Jared Diamond
New York: Viking Penguin, 2004. 592 pages.

Reviewed by KENNETH C. BRILL



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"This is the way the world ends / Not with a bang but a whimper."
—T.S. Eliot, "The Hollow Men"

Collapse: How Societies Choose to Fail or Succeed, Jared Diamond's hefty and challenging book, demonstrates that while popular history is replete with stories of conquered empires that ended with a bang, a number of civilizations collapsed under the weight of their own actions (or inactions) regarding their environment, and thus ended (perhaps literally) with T.S. Eliot's whimper. Diamond argues that the failures of the past provide lessons for today's societies; global prosperity and well-being require that we act on these lessons, so that the past does not become prologue.

Collapse has been widely reviewed in the press—even more widely discussed in the blogosphere—and Diamond has given a number of well-publicized speeches and interviews on its themes (including one published in last year's *ECSP Report*; see Diamond, 2004). So instead of offering a general review of the book, I will focus on some of the implications of Diamond's theses for today's policymakers and the informed public.

But first, a few comments on the book itself. Reading Diamond is always a pleasure, even when he is not writing about pleasant events. He writes well and entertainingly, and the amount of knowledge he can deploy to support his arguments is impressive, interesting, and often convincing. For example, instead of relying solely on academic studies for his chapters on the demise of the Easter Islanders and the Norse of Greenland, he visited the sites himself, which helps bring to life these long-past civilizations and the problems that caused them to fail.

While I enjoyed the book and admire what Diamond has accomplished, on balance he has probably done too much. At more than 500 pages, *Collapse* is a long read, even for the most committed. In chapter after chapter, Diamond makes his case and then piles on additional material that reconfirms an argument already well made. Less information might have been more convincing—in part because more people would have time to read the whole book.

Most valuable is Diamond's ability to make the past accessible and understandable, and then demonstrate its relevance to the present and future. Many of *Collapse's* critics argue that Diamond focuses on past civilizations that were uniquely vulnerable because they were island-based, or otherwise remote and resource-constrained. Therefore, according to these critics, these past experiences are irrelevant to today's world, which has the technology, science, and capital to deal with its problems. Some accuse Diamond of espousing "environmental determinism," a charge he rejects (page 302).

But these critics discount Diamond's opening chapter on the challenges facing today's

Montana. Diamond uses Montana's situation to illustrate that vulnerability is not unique to islands or drought-prone regions; even a seemingly prosperous state in the most affluent and technologically advanced nation in human history suffers from some of the same problems that undermined earlier civilizations. His review of four contemporary cases (Rwanda, the island of Hispaniola, China, and Australia) vividly demonstrates that the seeds of past "collapses" are very much present in today's world—and not only in the developing countries.

In the final chapter, Diamond declares that societies, in essence, choose to fail or succeed, and concludes that there is reason to be "cautiously optimistic." This optimism rests on his expectation that the seeds of collapse will not go completely unattended and that we will take sustainable steps to deal with them.

Lessons From *Collapse*

In the post-9/11 world, some in political and policy circles argue that security and terrorism must be our overriding concerns, making all other issues secondary. Diamond suggests that globalization and the interconnectedness of global systems require policymakers to take a broader view. To that end, policymakers should consider the following lessons drawn from *Collapse*.

Human impacts on the environment and other global systems have real-world consequences in the near term (e.g., for the war on terrorism). Failed states breed instability and insecurity well beyond their borders. Deforestation, one of the issues highlighted in *Collapse*, can affect state health and regional stability by undermining local livelihoods and creating conditions for long-term economic decline. For example, Charles Taylor's rape of Liberia's forests sustained several destabilizing insurgencies in West Africa and created conditions for continued instability in Liberia—and beyond. Had a forest certification scheme been in place, it would have been more difficult for Asian and European timber buyers to fund Taylor at the outset. Therefore, international and regional agreements on such issues as forests, fisheries, and water pollution are not just "nice" things to do for the environment, they are required for development, prosperity, stability and, ultimately, security.

Environmental problems need to regain the attention and priority they enjoyed in development aid programs of the 1990s. *Collapse* makes a strong case that environmental and human impact issues played a role in Rwanda's genocide, and Diamond is not the first to identify the political, security, and human consequences of Haiti's devastated environment. Other countries, such as Afghanistan, Uganda, and Namibia, support the argument that the environment must be a key component of any sustainable development program. In addition, the growing body of evidence on the impacts of climate change, the pressure on fresh water supplies, and the steady destruction of forests by legal and illegal logging, to name only a few, show that aid programs must make the environment a priority if we are to meet development goals—and promote regional stability and global security in the process (see Millennium Ecosystem Assessment, 2005).

In Chapter 14, Diamond notes that societies can make bad decisions and fail for a variety of reasons, such as not anticipating or perceiving problems. Clearly, in a globalized world, policymakers need long-term analyses of environmental and human "megatrends" to help them both anticipate and identify problems. It is, therefore, distressing that while the National Intelligence Council's (NIC) 2000 report, *Global Trends 2015,* addressed some issues related to human impacts on the environment, the recently released *Mapping the Global Future: Project 2020* (NIC, 2004) essentially does not. The NIC and other security bodies should regularly examine the impact of environmental problems on development and stability in key countries and regions.

Having information is only part of the battle. *Collapse* also argues in Chapter 14 that societies can fail if they do not respond rationally as a problem develops. The depletion of fisheries

International and regional agreements on such issues as forests, fisheries, and water pollution are not just "nice" things to do for the environment, they are required for development, prosperity, stability and, ultimately, security.

and the spread of persistent organic pollutants, for example, are known problems addressed by international and regional agreements. Climate change, on the other hand, is a known problem to which states have only partially responded. Not only has policy failed, but the public has also failed to insist that such known problems be addressed, not avoided.

The spread of democracy and the rule of law are essential to sustainably confront the human impact issues Diamond discusses (despite the unique example presented by the former Dominican dictator and environmentalist Joaquin Balaguer). Corruption is antithetical—and good governance is vital—to sustainable resource management and the regulation of human impacts on global environmental systems. But, as we have seen repeatedly, corruption is sure to occur when economic interests seek to exploit limited resources in the absence of transparency and strong legal systems.

Democracies tend to be both transparent and supportive of the rule of law. The United States has led the way in promoting the rule of law as an essential part of sustainable development, despite some developing countries' insistence that such issues are "political" and have no place in development discussions. However, developing countries' support for a global anti-corruption convention in 2003 indicates that the link between the rule of law and sustainable development is becoming more widely accepted. But more needs to be done, and in this regard, the Bush administration's broad efforts to promote international democratic reform could benefit the environment and help, in Diamond's words, societies choose to succeed.

Finally, the most fundamental step is one we all can take: individuals concerned about human impacts on the global environmental systems that sustain us must work steadily to increase the number of people who share those concerns. We must make the environment an important issue across the political and ideological spectra, by building inclusive coalitions, and, as Diamond points out in Chapter 15, working with—not against—businesses and other economic interests. For example, the Marine Stewardship Council, an NGO-industry collaboration that promotes sustainable fisheries and sustainable fishing practices, is constructively contributing to both the economy and the environment. Broad-based support is essential, if politicians and policymakers are to overcome the daily pressure to provide only short-term responses to any problem—and if we are to avoid perpetuating "the tragedy of the commons."

Collapse is a big book, and not just in its size. It raises important issues, suggests some ways forward, and should increase our understanding of why we must sustainably address human impacts on the environment and other global systems, at all levels—local, national, and international. In *Collapse*, Diamond describes how past civilizations have ended with a whimper, not a bang. Let us hope that we can learn from, and act on, these lessons from the past, so that unlike in "The Hollow Men," no shadow will fall "Between the idea / And the reality."

Author's Note: *the views expressed are solely those of the author and do not reflect in any way the views of the U.S. government.*

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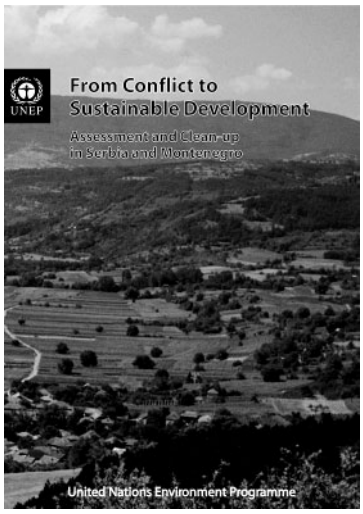
From Conflict to Sustainable Development: Assessment and Clean-up in Serbia and Montenegro (Final Report)

United Nations Environment Programme (UNEP)
Switzerland: UNEP, April 2004. 55 pages.

Desk Study on the Environment in Liberia

UNEP
Switzerland: UNEP, February 2004. 116 pages.

Reviewed by GREGORY D. FOSTER



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In December 2001, the United Nations Environment Programme (UNEP) announced the formation of a major new activity, the Post-Conflict Assessment Unit (PCAU), based in Geneva. Building on the earlier success of UNEP's assessments in the Balkans, PCAU was established to investigate the environmental impacts of conflict and pre-existing chronic environmental problems in war-torn regions, integrate environmental considerations into post-conflict recovery and reconstruction, recommend strategic priorities for post-conflict cleanup and remediation, and catalyze and mobilize international support for post-conflict environmental projects.

UNEP Executive Director Klaus Toepfer, at an October 2004 Wilson Center Environmental Change and Security Program event, described PCAU as the first—and most visible—of UNEP's three pillars of environment and conflict work.[1] UNEP considers post-conflict environmental assessments vital tools for determining the environmental impacts of conflict and for providing clear recommendations for remediation. PCAU therefore seeks to demonstrate the linkages connecting environmental degradation, public health, and sustainable development to identify environmental risks and promote sustainable resource use.[2]

PCAU's 38 reports cover Afghanistan, Albania, Serbia-Montenegro, Macedonia, Iraq, Liberia, the Occupied Palestinian Territories, and the effects of depleted uranium (in Bosnia-Herzegovina, Serbia-Montenegro, and Kosovo). Exclusively descriptive and reportorial in tone, these reports follow no common format but are all clearly written, well-edited, and ably supplemented by photos and maps that add to their readability.[3] The reports reviewed here—on Serbia-Montenegro and Liberia—typify both the variety and the quality of PCAU's written products.

Pekka Haavisto (2005), the former head of PCAU, draws three general conclusions from the post-conflict assessments conducted to date. First, a military conflict always has negative consequences for the environment that must be addressed as soon as the situation allows. Second, environmental concerns are not stand-alone issues, but should be fully integrated into both short-term humanitarian work and long-term reconstruction and development. Third, post-conflict environmental work can build confidence and peace, bilaterally and regionally;

where other topics are too sensitive to discuss, the environment can often serve as an icebreaker.

Serbia-Montenegro

From March to June of 1999, following the failure of the Rambouillet peace process, NATO conducted air strikes within the then-Federal Republic of Yugoslavia (FRY). The intensity of the air strikes—particularly those targeting industrial and military facilities—fueled claims that the conflict had produced massive air, land, and water pollution, leading to an environmental disaster.

UNEP and the UN Centre for Human Settlements initiated a neutral, independent, scientific assessment of the environmental situation in the FRY, sending four expert missions to the area between July and October 1999.[4] Based on the missions' fieldwork, UNEP concluded that the conflict had not produced a generalized environmental catastrophe, but that more localized impacts—combined in some cases with a long-term legacy of poor environmental management—gave cause for concern. In particular, the environmental situation at four "hot spots" in Serbia was so severe that the report urged their cleanup on humanitarian grounds, recommending the following steps:

- Clean the wastewater canal to the Danube River and remove mercury from the ground in Pancevo;
- Decontaminate dioxin and polychlorinated biphenyl hot spots in Kragujevac;
- Protect drinking water wells in Novi Sad; and
- Reduce sulfur dioxide emissions from the copper mine in Bor.[5]

UNEP identified 27 cleanup projects for these 4 hot spots at a total estimated cost of $20 million, and eventually generated $12.5 million in contributions from 10 donor countries to support 22 of them. UNEP awarded nearly 400 contracts to perform this work, some 300 of which went to local companies or institutions, thereby building local capacity and generating local income and employment.

Before handing over responsibility for the cleanup program to environmental authorities in Serbia-Montenegro, UNEP and the local authorities jointly assessed the four original hot spots, along with environmental conditions at three additional industrial sites. The final assessment found that:[6]

- The clean-up program was a notable success, especially in light of limited funding and time constraints, and significantly reduced conflict-related impacts at the four hot spots:
  - At Pancevo, where more than half of available funds were spent, conflict-related concerns were significantly reduced, though important environmental problems remain;
  - At Novi Sad, the risk of serious contamination affecting drinking-water supplies was substantially reduced and conflict-related environmental impacts systematically monitored;
  - At Kragujevac, the environmental impacts of the conflict (high PCB concentrations at various sites throughout the Zastava industrial complex) were successfully mitigated; and
  - At Bor, conflict-related environmental effects were largely mitigated (PCB contamination at the mining and smelting complex's transformer station), but were minor compared to the wider, pre-existing environmental problems affecting the area.
- The clean-up program generally strengthened environmental management institutions and helped resume and strengthen international and regional environmental cooperation;
- Conflict-related impacts represented only some of the environmental and health challenges at most locations—several sites still suffered considerable environmental problems;
- Strengthening national and local environmental management capacities will require continuing efforts to integrate the environment into the national development agenda and to promote preventive and precautionary environmental management;

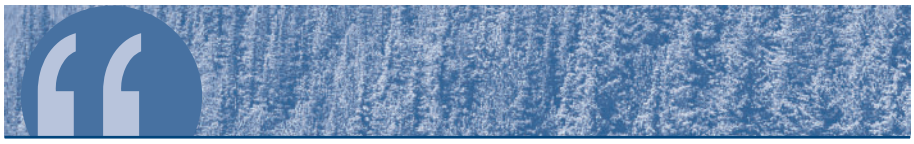
- Partnerships with donors, the wider international community, the UN system, and local counterparts and experts were fundamental to the program's success; and
- A faster start—with more immediate financial resources—would have produced even greater environmental benefits.

Liberia

Two missions to the Liberian capital of Monrovia met with stakeholders and collected data for UNEP's desk study following the Accra Peace Agreement of August 2003. As Pekka Haavisto points out in the report's introduction, the desk study is not a comprehensive environmental survey, but rather a rapid strategic assessment aimed at identifying the most urgent environmental issues for Liberia's post-conflict reconstruction.[7]

The report presents a disturbing litany of environmental stresses growing out of and contributing to Liberia's 14 years of civil war, including:

- The water supply systems in 10 urban areas outside Monrovia have completely collapsed, and only 26 percent of the population has access to safe drinking water;
- The sewage treatment plant in the capital, designed to treat waste water from 130,000 people, now treats waste water from 800,000;
- An estimated half a million people are living in temporary housing or refugee camps, often without adequate sanitation facilities;
- Household and commercial waste collection services in major towns and cities have mostly collapsed, and rubbish trucks, transfer stations, depots, and equipment have been looted, heavily damaged, or destroyed;
- The conflict left power plants, electricity substations, and transmission lines damaged and vandalized;
- Leaking oil storage facilities, alongside leaking pipelines and transformer fluids, threaten rivers and groundwater;
- As many as 99 percent of Liberians may now be dependent on charcoal and fuel wood for cooking and heating, further depleting the country's rich forest cover, which has declined to approximately 31 percent, a 7 percent decrease since 1990;
- Warring factions exploited and exported the country's rich timber resources to pay for arms and armies, which sharply increased the number of logging roads, thus accelerating the fragmentation of forest habitat, providing easier access for hunters and poachers, and increasing slash-and-burn agriculture; and
- Artisanal gold and diamond miners have cleared and excavated large areas of forest and river beds, as well as clogged and polluted rivers with suspended solids and harmful metals and cyanide.



The PCAU, via efforts like those described in these reports, has already achieved considerable success in making environmental concerns more than a peacetime issue.

These and other serious instances of degradation prompt Klaus Toepfer to note in the report's foreword:

> The misuse of natural resources has not only been a source of conflict in Liberia and the wider region, but has also sustained it. Effective and strong management to promote the sustainable use of natural resources is central to preventing additional conflict in Liberia. For the long-suffering people of Liberia, many of whom have been displaced and separated from their families, this new era provides them with a chance for a better future. (page 6)

To address these conditions, the report offers 60 recommendations that could serve as a template for environmental rehabilitation in any comparable situation. In addition to specific sectoral recommendations, the report proposes a number of more sweeping measures, including:

- Carry out comprehensive environmental assessments;
- Integrate environmental considerations into the reconstruction process;
- Create employment through the expansion of environmental protection;
- Improve environmental governance and international cooperation;
- Expand environmental information and awareness; and
- Develop and use creative financial mechanisms.

Conclusion

In a May 2004 address at the Wilson Center, Pekka Haavisto observed with frustration that governments seeking to recover from conflicts and negotiate peace rarely prioritize environmental concerns.[8] Yet the PCAU, via efforts like those described in these reports, has already achieved considerable success in making environmental concerns more than a peacetime issue, while donor interest, funding, and support have provided strong incentives for governments to undertake much-needed conservation and clean-up measures. Underscoring the intrinsic strategic importance of the environment, Haavisto emphasized that after a conflict, environmental conditions can either hinder recovery and development or provide an arena for negotiation and cooperation. "The post-conflict situation," he said, "is a unique opportunity to create something new."

Indeed, one hopes that thoroughly and systematically documenting the environmental costs of conflict may not only sensitize decision-makers to how environmental degradation may precipitate and nurture conflict, but also help prevent them from regarding violence as a fruitful strategic option in the first place. As Klaus Toepfer (n.d.) has argued: "Environmental security, both for reducing the threats of war, and in successfully rehabilitating a country following conflict, must no longer be viewed as a luxury but… as a fundamental part of a long lasting peace policy."

Notes

1. The second pillar of UNEP's environment and conflict work is ENVSEC (the Environment and Security Initiative), the UNEP European regional office's partnership with the United Nations Development Programme and the Organization for Security and Cooperation in Europe. The third pillar is the Environment and Conflict Prevention Initiative led by UNEP's Division of Early Warning and Assessment. See event summary on ECSP's website at http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.event_summary&event_id=95111

2. For more information on PCAU's methodology, please see http://postconflict.unep.ch/about.htm

3. All of these reports are available on the unit's website, at http://postconflict.unep.ch/publications.htm

4. The first mission took soil, air, and groundwater samples at industrial sites in 10 locations. A second mission visited several sites along the Danube River, while the third investigated the conflict's consequences on biodiversity, especially in protected areas. Finally, an expert team working in Kosovo studied municipal administration, the regularization of housing and property rights, the development of a cadastral (land survey) information system, and environmental policy and institutions in the province.

5. These findings were complemented by subsequent field research on the environmental risks arising from the use of depleted uranium weapons during the conflict; see http://postconflict.unep.ch/publications.htm#du for more information.

6. A technical report (UNEP, 2004) supplements these findings with detailed assessments and appraises the institutional capacity at each of the seven sites. Additionally, it offers detailed recommendations for the country's industrial sector and local institutional capacities; see http://postconflict.unep.ch/publications/assessment.pdf

7. Other recent desk studies have reported on Iraq and the Occupied Palestinian Territories; see http://postconflict.unep.ch/publications.htm

8. See event summary on ECSP's website, at http://www.wilsoncenter.org/index.cfm?topic_id=1413&fuseaction=topics.event_summary&event_id=68772. See also Airhart (2003).

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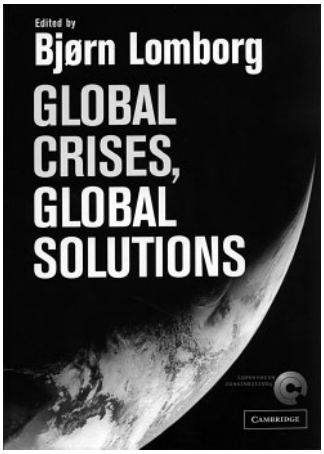
Global Crises, Global Solutions

Bjørn Lomborg (Ed.)
Cambridge, UK: Cambridge University Press, 2004. 647 pages.



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Global Crises: Unfortunately Unrecognized and Unsolved

Global Crises, Global Solutions is an unfortunate book. It begins with a good question: how should $50 billion (or some other large amount) of new foreign aid money be spent over the next four years to get the most "bang for the buck"? However, the method chosen to answer this question is fatally flawed, rendering the results useless, if not dangerous.

The flaws are apparent in the first 8 pages of the introductory chapter, which is the only section of this 647-page book written by its editor, Bjørn Lomborg. The fair and important question of how to prioritize our global challenges and opportunities certainly needs more serious attention. But Lomborg's method is problematic. First, he generated a list of 32 "general challenges facing humanity" by scouring UN publications (see Table 1). Even this initial step was not inclusive, because sustainability is not mentioned. The sustainability challenge is a core global problem, long recognized by the United Nations (see, e.g., World Commission on Environment and Development, 1987) so it is hard to imagine how a scan of UN publications missed it.

Another major flaw arises in the next step. Rather than circulating this list to a broad range of stakeholders for comment and review (as Lomborg acknowledges he could have done), he instead concluded that even though this effort might produce more "buy-in," it would take too long. It is ludicrous that he could not afford to devote another month or year to a process whose recommendations for spending billions on global problems he hoped would be taken seriously. Even a cursory glance at the initial list of problems would have identified the major omission mentioned above. Contrast this with the Intergovernmental Panel on Climate Change (2001) process or the Millennium Ecosystem Assessment's four-year, 1,300-participant process of scientific consensus building.[1]

Lomborg narrowed the original list of 32 challenges down to the 10 "found to hold the most promising opportunities" (page 4).

Table 1: Global Challenges in *Global Crises, Global Solutions*

The 32 Original Challenges Facing Humanity		The Final 10 Challenges Found to Hold the Most Promising Opportunities
Environment	**Governance**	Climate change
Air pollution	Arms proliferation	Communicable diseases
Chemical pollution and hazardous waste	Conflicts	Conflicts and arms proliferation
Climate change	Corruption	Access to education
Deforestation	Lack of education	Financial instability
Depletion of the ozone layer	Terrorism	Governance and corruption
Depletion of water resources	**Health and population**	Malnutrition and hunger
Lack of energy	Drugs	Migration
Land degradation	HIV/AIDS	Sanitation and access to clean water
Loss of biodiversity	Human settlements	Subsidies and trade barriers
Vulnerability to natural disasters	Lack of people of working age	
	Malaria	
Economy	Living conditions of children	
Digital divide	Living conditions of women	
Financial instability	Non-communicable diseases	
Lack of intellectual property rights	Undernutrition/hunger	
Money laundering	Unsafe water and lack of sanitation	
Subsidies and trade barriers	Vaccine-preventable diseases	
Transport and infrastructure		

Found by whom? Eight like-minded economists who met for one week—hardly worthy of the name "Copenhagen consensus," considering the problems' magnitude.[2] The bias inherent in both of these initial winnowing steps is huge but never acknowledged. For example, while the initial list of 32 includes 10 environmental challenges, ranging from air pollution to deforestation, from lack of energy and water to climate change, the final list includes only one environmental entry: climate change.

Contrast this with Jared Diamond's (2004) list of the 12 most serious environmental problems facing past and future societies—problems that more often than not have led to the well-documented collapse of these historical societies:

- Loss of habitat and ecosystem services;
- Overfishing;
- Loss of biodiversity;
- Soil erosion and degradation;
- Energy limits;
- Freshwater limits;
- Photosynthetic capacity limits;
- Toxic chemicals;
- Alien species introductions;
- Climate change;
- Population growth; and
- Human consumption levels.

While climate change is certainly a serious problem, and has contributed to several histori-

cal collapses—as Diamond and several others (Tainter, 1988; Yoffee & Cowgill, 1988; Ponting, 1991) have pointed out—the interplay of multiple factors is almost always more critical than a single one. Societies on the edge become brittle and lose resilience, making them more susceptible to the impacts of climate change as well as to other potential perturbations, such as political corruption, war, terrorism, or the inability to adapt to new circumstances.

Lomborg commissioned a background paper on each of the 10 challenges from "renowned economics specialists within each field" (page 5). These 10 papers, along with two "alternative perspectives" on each challenge, form the bulk of the book. Unfortunately, while presenting a slightly broader perspective than that of the original eight experts, these papers still draw from far too narrow a set. Despite this, most of the papers in the collection are well worth reading for what they are: statements of a particular position, based on a particular worldview, on a particular complex issue. Missing—for the purposes of this book's stated aims—are truly alternative positions. Perhaps most important, however, is the lack of any appreciation of the interconnectedness of the global challenges—a systems perspective. The book assumes that these challenges are independently solvable and therefore able to be ranked in a simple linear fashion.

The final chapter of *Global Crises, Global Solutions* presents the experts' "consensus" ranking of the alternatives. This, again, is a misuse of the term: each expert ranked the alternatives independently, and Lomborg presents the mean rankings as the consensus. Fortunately, the book includes each expert's individual rankings and reasoning, so that the reader can reconstruct the (still limited) range of opinions and the rationales behind the individual rankings.

What can we conclude about the original question? Unfortunately, very little. We have only the opinions of eight economists, whose thinking on these topics was already well-known before the exercise and changed very little after one week in Copenhagen. We are left with the mere illusion of scientific consensus, an illusion which the editor obviously intended.

But there is a deeper issue. This work demonstrates how worldview or vision can shape the results of purportedly objective analysis. Lomborg and the contributing authors share a worldview that has been called "technological optimism" (Costanza, 2000). Technological optimists assume that technical progress will solve all current and future social problems. Humans and their dominion over nature will continue to expand without limits. This worldview does not see population growth and overconsumption, among other sustainability issues, as problems.

As the work of Diamond (2004), Meadows et al. (2004), and literally thousands of other authors have shown, the problem of sustainability is today's core global problem. Will our completely interconnected global society fall into the same traps that led to Easter Island's collapse? I hope not, but we cannot assume these problems will be addressed, as Lomborg and associates do, by simply believing in the power of technology.

Unfortunately, even the title of Lomborg's book is a sad sham: the authors do not believe that there are any truly global crises, only challenges that a few tens of billions of dollars can solve. They have done the world a grave disservice by holding on to their unquestioned values and assumptions about the feasibility of unlimited economic growth. As demonstrated by the fate of the Easter Islanders, the Maya, the Greenland Norse, and several other historical societies, clinging to maladaptive values in the face of mounting evidence to the contrary could lead to collapse (Diamond, 2004). If we are to create a sustainable and desirable global human society in the 21st century, we must not repeat the same mistakes. This real global crisis requires global solutions, but instead Lomborg's book only perpetrates past myths.

The book assumes that these challenges are independently solvable and therefore able to be ranked in a simple linear fashion.

Notes

1. See www.maweb.org for more information on the Millennium Ecosystem Assessment.

2. It is interesting to note that while Lomborg feels that a small group of like-minded economists are the

appropriate "experts" to consult on the best way to solve global problems, he has no trouble dismissing the broad and overwhelming scientific consensus reached by experts on the biophysical aspects of environmental issues (Lomborg, 2001).

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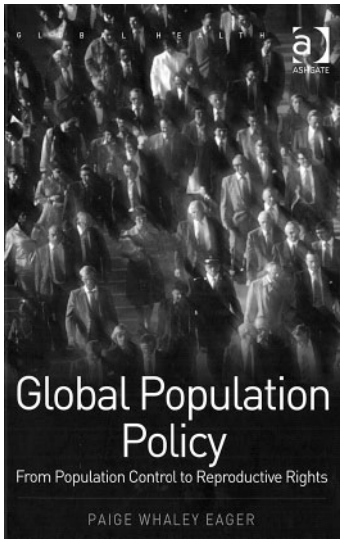
Global Population Policy: From Population Control to Reproductive Rights

Paige Whaley Eager
Aldershot, UK: Ashgate, 2004. 234 pages.

Reviewed by DUFF GILLESPIE



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No one can accuse Paige Whaley Eager of being overly nuanced. Starting with the title of her book, *Global Population Policy: From Population Control to Reproductive Rights,* she confronts the reader with absolutes. There has never been, of course, a "global population policy," nor can humankind's complex and diverse response to population and reproduction be easily separated into two camps, population control and reproductive rights.

For Eager, the evolution of population policy has been a tectonic battle between evil ("population controllers") and good (the "Global Women's Health and Rights Movement" or GWHRM). Population controllers are white men, mostly American, who are hell-bent on reducing the rate of population growth for economic, political, and national security reasons. Until the Reagan Administration, these powerful men made population control the centerpiece of U.S. foreign policy. They encouraged "governmental use of coercive methods" to compel women to use "unsafe contraceptives" (page 6).

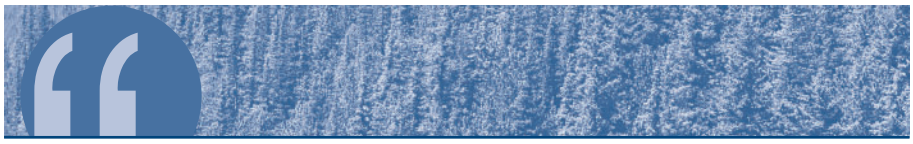
Eager outlines the population controllers' other transgressions, the most egregious of

which is their disregard for women, who they view as little more than instruments for lowering the population growth rate. While there is no doubt that government family planning programs have perpetrated serious human rights abuses, Eager spends little time documenting them. If she had, she would have found such abuses to be the exception, not the rule, and certainly not as pervasive as her book implies.

Arrayed against this monolithic cabal of population controllers is the GWHRM, a construct Eager never really explains. She does describe in some detail how various women's groups, mostly from the North, altered the policy landscape in fundamental ways. Their labors were rewarded at the 1994 International Conference on Population and Development in Cairo, where essentially all countries endorsed a more comprehensive view of population that encompasses the concepts of sexual and reproductive health and rights (SRHR). Surprisingly, Eager spends very little time explaining SRHR but dwells extensively on what it is not: population control.

Quite rightly, Eager states that such terms as "population control" have been largely banished from official lexicons throughout the world. This excision is more than symbolic; policies and government officials are generally more sensitive to the rights and needs of women. Indeed, Eager could make a stronger case for the GWHRM by documenting the significant policy changes since Cairo throughout the developing world, such as raising the age of marriage, liberalizing abortion and divorce laws, and criminalizing or discouraging female genital cutting.

When polemists dichotomize complex subjects, their simplifications often distort reality. Eager is no exception: she gets many things—far too many to cover here—just plain wrong. One of her most egregious errors is her disdain for the underlying rationale of "population controllers": that rapid population growth impedes socio-economic development. Her derision is based on her personal philosophy; she makes no attempt to refute this assumption analytically and appears unaware of the extensive literature on population and development. If Eager had consulted the masterful volume edited by Birdsall, Kelley, and Sinding (2001), she would have learned that the importance of population dynamics to development has never been as well-documented as it is today. Most of what the "population controllers" have been saying over the last three decades is actually true.



There has never been, of course, a "global population policy," nor can humankind's complex and diverse response to population and reproduction be easily separated into two camps, population control and reproductive rights.

Eager's biggest mistake is grossly overstating the influence of the United States in convincing the developing world to decrease fertility rates. She is not only wrong, but also insulting. First, Eager tries to make the case that decreasing fertility is a core component of U.S. foreign assistance policy, which has never been the case. Uncomfortable realities that would call into question her assumptions about the United States' priorities are not presented or, perhaps, not known by the author. Eager feels the United States was particularly influential in the 1970s; yet, the annual budget for population programs ranged between $120 million to $250 million, and the total staff never exceeded 200 people. This modest level of commitment hardly reflects a high priority.

Unintentionally, Eager's portrayal of U.S. population controllers convincing or hoodwinking developing-country governments into mounting efforts to reduce their fertility is demeaning and wrong. For example, if the

author had even cursorily examined the literature she would have discovered that Asian countries incorporated fertility reduction in their development plans before the United States even had a population program. It never seemed to occur to her that these countries, and just about every developing country today, might institute such policies and programs because they meet the needs and desires of their citizens when carried out in ways that respect those needs and desires.

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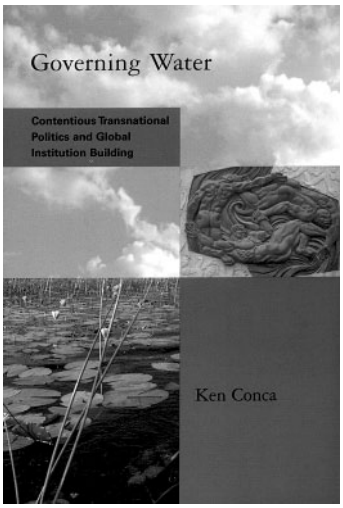

Governing Water: Contentious Transnational Politics and Global Institution Building

Ken Conca
Cambridge, MA: MIT Press, 2005. 457 pages.

Reviewed by ANTHONY R. TURTON

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Integrated Water Resource Management (IWRM) suffers from a paucity of new knowledge, particularly in theoretical approaches. Very little of the last decade's avalanche of IWRM literature is groundbreaking or deeply insightful. The new angle on an age-old problem outlined in Ken Conca's *Governing Water: Contentious Transnational Politics and Global Institution Building* is therefore a breath of fresh air.

Governing Water is a hefty piece of work—457 pages—but its sheer size does not overwhelm the exquisite intellectual thread Conca expertly weaves. This sincere attempt to open the "black box" obscuring the governance of transboundary rivers describes efforts to conquer water resources through "violent" acts, such as dam building and aggressive engineering, and the counter-offensives against these acts.

A Funny Thing Happened

Conca introduces the *problematique* of IWRM governance with an elegant analysis of the opening ceremony of the Second World Water Forum at The Hague in 2000. The slick and glitzy event was cleverly hijacked by a naked woman and a number of athletic young men, who abseiled from the rafters above the keynote speaker's head, unfurling banners protesting the construction of a large dam in Spain. This cunningly planned protest action is deeply symbolic of the underlying tensions in the global quest to manage water. "A funny thing happened on the way to the World Water Forum," Conca observes wittily:

> The official report on the forum and ministerial conference made no mention of the disruptive incident or any other expres-

> sions of dissent throughout the meeting.…One motive for writing this book is to examine the stark disconnect between the forum's blueprint for forging a global water regime and the contentious politics surrounding water all around the world. (page 2)

Conca lists a series of vexing questions. Whose water is it? Who should have the legitimate power to decide? What does it mean to describe governments as sovereign and legitimate while also calling for private sector investment? What are the relationships among authority in the watershed, boardroom, and nation-state? Is there hope for a cooperative and broadly legitimate approach to water governance?

Shifting Focus

Having laid the foundation, Conca focuses on the politics of global institution building around local ecosystems, which he claims play three fundamental roles:

- They transcend elements of scale;
- They sustain local livelihoods and engender vibrant cultures that become unique identifying labels in a globalized world; and
- Increasingly, they are subjects of the global economic market, either as basic natural resources or ecotourism goods and services.[1]

Conca seeks to understand the inadequacy of negotiated international agreements or "regimes," which too often die on the negotiating table or prove ineffective. In light of this inadequacy, he shifts the focus from the regime paradigm in two new directions:

- Away from the environmental problems that neatly fit the regime solution towards the hidden, creeping, and cumulative impacts of the "assault on the global environment"; and
- Away from the substantive content of global environmental cooperation towards the procedural elements of environmental conflict.

Together, these new foci enable the reader to critically examine the way we establish rules that "channel deeply divisive, contentious debates when a broad consensus on substance may be unattainable" (page 6).

Pushing Rivers Around

Governing Water's first seven chapters each address an element of water governance, followed by two country case studies (Brazil and South Africa). Chapter 2 questions mainstream international relations (IR) scholarship, which does not seem to challenge the inherent flaws in choosing regimes to regulate interstate intercourse. Although regimes are assumed to be produced by bargaining, Conca argues that they actually take the form desired by the dominant coalition.[2]

Chapter 3, "Pushing Rivers Around," describes the impact of a century of dam building on southern Africa's culture and ecosystems. Rivers mean different things to different actors or stakeholders; they are spatial and temporal links that cross a range of issues and scales from the local to the international. Recognizing this, Conca provides critical but sensitive insights into the complexity of river basin management. He plumbs society's "hydraulic mission," identifying an emerging transnational network of technical experts who construct dams and related hydraulic infrastructure for multinational firms and global financial institutions. Conca makes a forceful case for shifting the focus of our scholarly attention to the cumulative impact of these individual acts of ecosystem modification.

Hydropolitical Theory

Chapter 4 provides excellent empirical insights into the emergence of a global regime on water resource management, starting with three startling new facts, discovered largely by Aaron Wolf's Transboundary Freshwater Dispute Database (TFDD) team at Oregon State University:[3]

- The number of international rivers has increased as more rivers are "internationalized" by changes in political geography after the Cold War;
- International river basins cover almost half of the planet's land area; and
- A part of almost all sovereign states is located in an international river basin.

This is compelling stuff, because the lack of a theory of hydropolitics is IR's black hole—a hole that *Governing Water* may begin to plug. While many intuitively believe that water is a driver of conflict, as asserted by the now largely discredited "water wars" literature (e.g., Irani, 1991; Starr, 1991; Bulloch & Darwish, 1993; Gleick, 1994; de Villiers, 1999), Jesse Hamner and Aaron Wolf (1997) have shown that water resource management is more likely to catalyze cooperation than conflict between nation-states. According to their work, 145 international treaties on shared river basins have been generated since 1814 (Wolf et al., 2003). This is likely a gross underestimate, further strengthening Conca's argument (see, e.g., Turton et al., 2004, pages 387-389; Ashton et al., 2005).[4]

Significantly, Conca finds that the content of basin-level accords has escaped serious notice, noting that "even if most of the world's shared basins remain uncovered by international accords, those for which accords are in place could be converging on a set of norms for shared governance" (page 106). Empirical evidence tentatively shows convergence around some core concepts—mostly procedural issues, such as sharing data and building confidence—but these are still framed in the polarizing language of sovereignty. Consequently, there is little evidence of a common normative structure.

Water Is a Social and an Economic Resource

Chapter 5 analyzes the emergence of a global community under the banner of IWRM. Caught in the tension between planning and marketization, this global network is ambivalent toward the most fundamentally contested issues in the water sector—the basic questions Conca poses (noted above)—leading to the near-hegemony of the core logic of IWRM. However, challenges to this hegemony include the nascent WISER ("Water Is a Social and an Economic Resource") discourse that seeks to elevate the social values of water (see Allan, 2000, page 27).

Another challenge starting to raise its head (but not listed in *Governing Water)* disputes the assumption that the river basin is the natural unit of management. The four most economically developed countries in southern Africa—South Africa, Botswana, Namibia, and Zimbabwe—are all reaching the limits of their readily available water and thus may face constraints on their economic growth. However, this constraint is being effectively managed by a combined policy that uses interbasin transfers and moves water out of agriculture to the industrial and services sectors, a softer approach heavily dependent on the existence of effective governance structures.

The Real Water Wars

Chapter 6 unpacks the complex dynamics of the anti-dam lobby and the democratization of watershed management. Conca builds a case for the real water wars—not between sovereign states, but between sub-national groups. An array of state entities and other beneficiaries of large engineering projects are pitted against opponents from the affected communities, aligned with sympathetic environmental and human rights NGOs. These disputes often fly under the radar of international river diplomacy, rendering the international regime a "blunt and limited instrument for responding to this type of complex, multilayered struggle, for all the reasons discussed in Chapter 2" (page 169).

Defining a bounded, finite, fixed "sovereign" territory is problematic when dealing with rivers that are fluid, dynamic, and complex. Conca usefully notes that one way out of this core hydropolitical conundrum is to draw distinctions among transnational advocacy groups (grounded in information-based framing poli-

tics), transnational coalitions (grounded in coordinated campaigns), and transnational social movements (grounded in joint mobilization), thus shifting the focus to assess norms evolving around notions of watershed democracy.

At the Second World Water Forum, Ismail Serageldin (then vice president of the World Bank) asserted that two controversies stood in the way of global progress towards a more sustainable water future: the debate over large dams, and a complex set of economic issues relating to property rights, privatization, water exports, water pricing, and foreign investment and ownership in the water sector. While unraveling this set of issues in Chapter 7, Conca discusses the implications for the subnational water sector of the General Agreement on Trade in Services (GATS), which seeks to liberalize trade in services and ferret out regulations that restrain it. GATS thus opens up water and sanitation services as possible targets, and consequently potential entry points, for foreign actors in a traditionally national sphere. This whole new arena for hydropolitical interaction is mostly unknown to water resource managers and professionals, particularly in the developing world.

Brazil and South Africa: Case Studies

Brazil and South Africa are central players in the global debate surrounding water and rivers; both countries have important transboundary river basins and strong social movements protesting large dams and the privatization of water. Much of the water in Brazil, which is a signatory to 15 international water agreements, is the subject of active and violent dispute. Yet, despite these enduring conflicts, governance of water and aquatic ecosystems in Brazil is increasingly institutionalized around a shared understanding of roles and rules.

The complex case of South Africa is seldom fully understood by foreign writers. Conca does an exceptionally good job, however, of tracing the golden thread of water and political contestation in the country. Post-apartheid South African water law, policy, and practice is more technocratic and less participatory than Brazil's. In addition, South Africa's desire to be a good riparian neighbor has shaped water governance. Water marketization and associated issues are more controversial in South Africa, but Brazil has witnessed greater resistance to water infrastructure projects. These conclusions demonstrate the great value that serious empirical studies can offer to the discipline of hydropolitics and IR theory.

Four important forces—international law, neoliberal structural adjustment, elite networking among water resource professionals, and transnational activism for the rights of local communities—are pushing and pulling water-related policies, laws, and practices in different directions.

Conclusion

Four important forces—international law, neoliberal structural adjustment, elite networking among water resource professionals, and transnational activism for the rights of local communities—are pushing and pulling water-related policies, laws, and practices in different directions. Each force is thoroughly transnational and sufficiently embedded in international intercourse to govern and influence global practice, but none has yet generated a dominant framework for governing watershed practices at the local level. Therefore, if watershed governance is being normalized across national boundaries, it is taking place at the intersection of these various forces. Consequently, we should not assume that international environ-

mental agreements are the best—or indeed the only—ways to govern rivers and aquatic ecosystems that cross international political borders.

In conclusion, Conca's well-written and thought-provoking *Governing Water: Contentious Transnational Politics and Global Institution Building* is a serious book. It fills major gaps in IR theory, IWRM literature, and the discipline of environmental security, and it informs water resource managers of the implications of GATS. It demonstrates the real value of empirical research, taking its place alongside the paradigm-busting work led by Aaron Wolf at Oregon State University, Peter Ashton at the Council for Scientific and Industrial Research (CSIR) in South Africa, Tony Allan at the Water Issues Group in London, and Nils Petter Gleditsch at the International Peace Research Institute in Oslo. Conca's work should be read by university students, water sector professionals, and IR scholars alike, and I sincerely believe that it will play a substantial role in placing the discipline of hydropolitics firmly on the IR research agenda.

Notes

1. These three roles resonate with a current initiative by the Universities Partnership for Transboundary Waters (UPTW) to understand governance of water and aquatic ecosystems as the manifestation of a "trialogue," which is a specialized form of dialogue among government, science, and society. In conjunction with Group on Development Issues (EGDI) at the Swedish Ministry of Foreign Affairs, the Swedish Water House, and UNESCO, UPTW hosted a special session at the Stockholm World Water Week 2005. Following a second workshop in October 2005, the trialogue governance model will be published in a textbook and a special edited volume of *Water Policy,* the scientific journal of the World Water Council.

2. This echoes research by Tony Allan and his team of graduate students at the School of Oriental and African Studies and Kings College London into what they are calling "hydro-hegemony."

3. For more information, see http://www.transboundarywaters.orst.edu/

4. Table 9.1 in Turton et al. (2004) identifies 30 international water agreements to which South Africa is a signatory, 20 of which are not listed in the *Atlas of International Freshwater Agreements* (United Nations Environment Programme, 2002). Ashton et al. (2005) has identified 59, but not all of these are limited to river basin management.

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HIV and National Security: Where Are the Links?

Laurie Garrett
New York: Council on Foreign Relations, 2005. 67 pages.

Reviewed by JENNIFER WISNEWSKI KACZOR

Jennifer Wisnewski Kaczor is a program associate for the Environmental Change and Security Program.

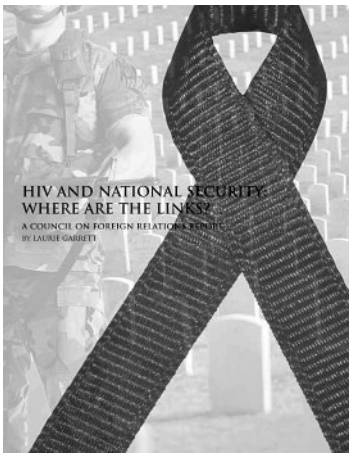
Since 2000, the international policymaking community has discussed HIV/AIDS in the context of national and international security. *HIV and National Security: Where Are the Links?* by Laurie Garrett of the Council on Foreign Relations summarizes the state of the argument and examines the research linking HIV/AIDS to security.[1]

Garrett treads familiar ground, detailing the risks posed by high HIV prevalence in militaries, infection rates among UN peacekeepers, the impact of AIDS orphans, demographic trends such as "youth bulges" and urbanization, and the connections to economic security. Despite the lack of groundbreaking information, Garrett is careful to outline the real challenges facing assessments of AIDS' threat to national and international security. One interesting chapter calls for more funding to improve tracking of virus types and mutations, outlining the real benefits to the international community. Policy reports rarely delve into the science of the disease, and Garrett's argument for improved tracking is convincing.

Interestingly, Garrett chooses to begin the body of the report by comparing HIV/AIDS to another great killer, the Black Plague, which ravaged Europe in the 13th, 14th, and 15th centuries, wiping out two-thirds of the population and bringing sweeping social, political, and economic changes in its wake. Though the case of the Black Plague illustrates the way a disease can engender widespread social change, it is unclear exactly what policymakers should take away from this lesson. Most historians would argue that the long-term impacts of the Black Plague led to the end of feudalism and the eventual rise of democracy in Europe. Garrett could have better spent the space by citing specific examples of successful initiatives or projects—international, national, and local—that could mitigate the impacts of the HIV/AIDS epidemic.

Despite this one problem, Garrett ends strongly with six key recommendations for policymakers, including:

- Develop strategies for preventing the emergence of drug-resistant HIV strains;
- Develop HIV-prevention programs aimed specifically at uniformed personnel;
- Use viral genetic fingerprinting to track the spread of HIV;
- Fund long-term longitudinal studies on population cohorts to study the social, political, and economic impact of the AIDS epidemic;
- Develop an HIV vaccine; and
- Develop strategies to provide HIV treatment for all sufferers, not only the elite.



HIV and National Security is most useful for those interested in a review of the current literature linking AIDS to security issues. It is a concise, well-written, and useful addition to the literature on this important connection.

Notes

1. A pdf copy of the report can be downloaded from the Council on Foreign Relations website, at http://www.cfr.org/content/publications/attachments/HIV_National_Security.pdf

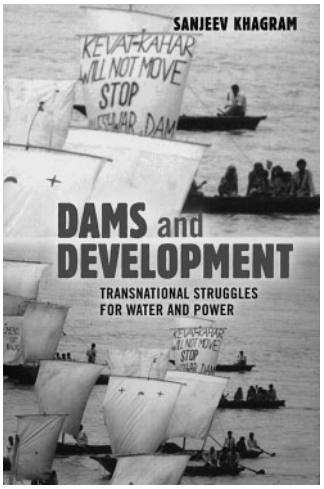
Dams and Development: Transnational Struggles for Water and Power

By Sanjeev Khagram
Ithaca: Cornell University Press, 2004. 270 pages.

Identity, Conflict and Cooperation in International River Systems

By Jack Kalpakian
Aldershot, UK: Ashgate, 2004. 213 pages.

Reviewed by ANTON EARLE



Anton Earle is the deputy head of the African Water Issues Research Unit, based at the University of Pretoria, South Africa. He conducts applied research into southern African water management issues, with a specific focus on transboundary water management. As a member of the Regional Technical Committee of the Global Water Partnership-Southern Africa, he facilitates research and capacity-building initiatives on transboundary water management issues in the Okavango, Limpopo, Orange-Senqu, and Incomati river basins.

Fresh water—its availability, distribution, and control—has been woven into the fabric of human settlement and development at least since the Neolithic Revolution. Not only necessary for daily survival, water is an essential part of our economy, society, and ecology. But this much-needed resource is distributed across space and time in a highly dispersed and variable pattern. Not only do large parts of the globe contend with general water scarcity, they also suffer fluctuations in supply.

In reaction to this natural climatic variability, people have tried to secure their water supplies in dry times, storing water in reservoirs or transferring it from water-rich areas. The path toward hydro-security invariably crosses the tracks of power—be it political, economic, or military. Powerful countries can appropriate a greater share of water resources, while powerful groups within countries can mobilize resources in their favor. Large-scale infrastructure development can provide many benefits, but the costs affect different groups in unequal measures. On an international scale, these power inequalities have sparked debate about the likelihood of "water wars." Especially in the world's arid zones, such as the Middle East and southern Africa, some predict that the wars of the future will be fought to secure scarce water resources for growing populations—although none have to date (Wolf et al., 2003). On a local level increased water demand, especially due to urbanization and industrialization, pits rural communities dependent on agriculture against the supporters of large dam-building projects.

Dams and Development

In *Dams and Development: Transnational Struggles for Water and Power*, Sanjeev Khagram describes the rising opposition to large-scale dam-building projects in the developing world. According to Khagram, the traditional model of development seeks mainly to enlarge GDP through large-scale, top-down technocratic

methods of exploiting natural resources. The alternative vision of development is based on "bottom-up participatory processes directed towards socially just and ecologically sustainable outcomes," which is gaining more international acceptance (page 4). He contends that the conflicts associated with competition between these two modes of development have been most vividly displayed in the transnational opposition to large-dam projects.

Khagram identifies three important prerequisites for ensuring effective opposition to large-dam projects:

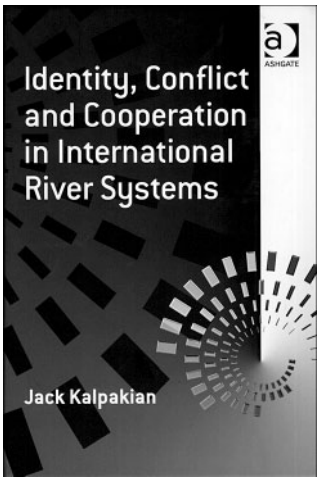
- Global norms and principles regarding human rights, indigenous peoples, and the environment, among others, must converge in international anti-dam pressure groups;
- Local opposition to large-dam projects must link up with international pressure groups to be effective; and
- The political environment must be open and democratic, upholding civil liberties such as freedom of the press, equality before the law, and freedom of association.

Khagram investigates case studies from six developing countries with different degrees of local opposition to large dams—India, Brazil, Indonesia, South Africa, Lesotho, and China—but half the book is devoted to India's Narmada River project. Initial local resistance efforts in the 1950s were unsuccessful; only after local groups began working with international groups did they stop the largest components of the project. By making international donors, such as the World Bank, aware of the project's negative social and environmental impacts, the opposition swung opinion their way. Intuitively, one would expect this nonviolent approach to be more successful in the land of Mahatma Gandhi than in Indonesia or China.

Surprisingly, social resistance to large dams managed to flourish in Brazil, even during the military rule of 1964–1985. The World Commission on Dams (WCD), of which Khagram was a member, ranks Brazil as one of the top 10 big-dam builders in the world (WCD, 2000). Since the 1950s, successive governments developed plans for large-scale water storage, water transfer, and hydropower schemes. By the mid-1980s, anti-dam groups had managed to mobilize around issues such as native rights, displacement processes, compensation packages, and environmental concerns, in conjunction with international movements. Most of the projects were abandoned as costs spiraled, driven by the social and environmental provisions required for construction and operation. Brazil's debt crisis in the 1980s reduced public funding for big-dam projects, but the efforts of social opposition movements prevented the country from borrowing money from the World Bank and other donors to fill the gap.

A rapidly industrializing arid country, South Africa is also ranked among the top 10 large-dam builders by the WCD. Khagram hypothesizes that the Lesotho Highlands Water Project, which sought to transfer water from South Africa's neighbor, moved ahead in 1986 and completed its first phase in 2002 due to a lack of domestic social resistance to the project. Khagram does not tell us, however, whether

> The cases show that countries' actions are more likely to be informed by national identity issues than by hydrologic realities. Thus, Sudan chooses to side with Egypt in the management of the Nile River, even though it could gain more by siding with other riparians. The common culture and religion shared by the countries' ruling elites exert greater influence than hydrology.



people in the region supported the project or whether resistance faded in the face of political turbulence in the early 1990s. Certainly, the rate of big-dam building in South Africa has dropped markedly over the past decade, but is this due to social mobilization against dams or because all the prime sites are in use? This question could also be posed about Brazil and India.

While *Dams and Development* provides a wealth of detailed information on international opposition to big-dam building in the developing world, it focuses too much on India's Narmada Valley. The reader is caught up in the minutiae of protest marches, meetings, and court cases. Coupled with the large number of acronyms and mixture of metric and imperial measurement units (e.g., acre-feet coexist with cubic meters), the book is cumbersome to read. However, these problems should not detract from its solid contribution to the scientific literature—they just require the reader's perseverance.

Identity, Conflict and Cooperation in International River Systems

In *Identity, Conflict and Cooperation in International River Systems*, Jack Kalpakian sets out to correct the emphasis on water conflict in international relations literature. For a book that grew out of a Ph.D. dissertation, it reads surprisingly well, reviewing literature on international river management and using three case studies to illustrate the de-coupling of water as a direct driver of conflict. The author disproves the hypothesis that water disputes lead to serious conflicts between states, but he fails to convince us when he refers to this as "a completely unforeseen result" (page 2).

Kalpakian's literature review focuses on the Realist and post-Realist schools of international relations, with an emphasis on writers such as Thomas Homer-Dixon (1995a, 1995b), Thomas Naff (1993), and Nurit Kliot (1994), all broadly in the "water wars" camp. Although he notes that water disputes do not cause interstate conflicts—instead, he says they are "secondary fora for conflicts rooted in national identity questions" (page 7)—he does not mention the research conducted by Aaron Wolf (1998; Wolf et al., 2003), Anthony Allan (1998a, 1998b, 1999, 2000, 2002), and Anthony Turton (2003; Turton & Earle, 2005), which promotes this alternative school of thought. In other words, issues of national identity and views of co-riparian states are more likely sources of conflict than water. The omission of the work by Wolf, Allan, and Turton on this view detracts from the book and is a surprising oversight.

The strength of *Identity, Conflict and Cooperation* lies in its comprehensively researched case studies of the Nile, Tigris-Euphrates, and Indus rivers, which include a wealth of data on hydrology, water use, and socio-economic conditions in the basin states. In all three cases, data are contested—the basin states do not agree on even basic facts such as the extent and size of catchments. The cases show that countries' actions are more likely to be informed by national identity issues than by hydrologic realities. Thus, Sudan chooses to side with Egypt in the management of the Nile River, even though it could gain more by siding with other riparians. The common culture and religion shared by the countries' ruling elites exert greater influence than hydrology. Consequently, the state "is becoming less and less of an independent actor in International Relations" (page 84).

Disputes over the allocation of water from the Tigris-Euphrates will only end once the underlying identity clash is resolved, which dates to World War I and the animosity between Turkey and its Arab neighbors arising from the demise of the Ottoman Empire. Syria's intermittent support of Kurdish separatist movements in Turkey also destabilizes the relationship. "Identity tends to be both the organizing criteria and cause of conflict. It is rooted in the language of exclusion and inclusion of groups into or out of the respective national governing communities of the states involved" (page 140).

The 1960 agreement between Indian Prime Minister Jawaharlal Nehru and Pakistani President Field Marshall Ayub Khan resolved issues of water allocation, financing, and adju-

dication on the Indus River. Unfortunately, this functional cooperation—even at a political level—has not spilled over into general relations between the two countries. Three wars (1947, 1965, and 1971) have been fought between the states, the first two over Kashmir and the last on the partitioning of Bangladesh. Much of the rest of the basin (e.g., Afghanistan and Nepal) also lacks peace and stability. Thus the hydrologic interdependence between India and Pakistan, although leading to cooperation over water resources, has not led to peace in the region. The reader is left to wonder if a greater degree of water stress would contribute to the hostility between the states—a significant omission from an otherwise illuminating case study.

Dams and Development and *Identity, Conflict and Cooperation* are solid contributions to our understanding of the nexus of water, power, and conflict, at the interstate as well as domestic level. Both books have their limitations—such as a lack of maps illustrating the case studies—and could have used a good editor to improve the readability of the first and correct the second's many spelling and grammatical errors. But these problems do not detract from the books' overall usefulness to the study of water conflict and cooperation.

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Journal of Peace Research: Special Issue on the Demography of Conflict and Violence

Henrik Urdal and Helge Brunborg (Eds.)
Volume 42, No. 4, July 2005.

Reviewed by CHRISTIAN LEUPRECHT

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The *Journal of Peace Research (JPR)* can always be relied upon to deliver an interesting, relevant, high-quality product. This special issue, tackling the relationship between demography and conflict, lives up to *JPR*'s reputation.[1]

In recent years, the prominence of conflict and demography has grown. In the aftermath of the Cold War, international wars have almost disappeared. Domestic strife has also waned. All forms of civil war—e.g., ideological, revolutionary—have declined, save one: ethnopolitical conflict. The vast majority of civil conflicts now involve issues of language, culture, and especially religion. Since 3,000 of the world's estimated 5,000 ethnic groups are located in Asia and another 1,800 in Africa, it is no surprise that these two continents have emerged as the world's main internecine flashpoints.

These two continents are also of particular interest to demographers. On no continent is the population expected to burgeon in the 21st century as in Africa. AIDS notwithstanding (70 percent of those infected with the virus live in Africa), the continent's population is projected to grow 50 percent by 2050. Similarly, many Asian states, especially the arc of Muslim countries stretching from Egypt through Indonesia, will continue to be subject to considerable—albeit differentiated—pressures owing to their growing populations.

Demographic composition and demographic change are never a cause of conflict or violence, per se. Researchers tends to ask questions about contingency instead: what impact, if any, might a population's composition have on political stability? To what extent does relative deprivation factor into the relationship between demographic change and conflict? Is the competition for scarce natural resources, such as water, a growing problem? And how does migration affect population dynamics within and between population groups?

Two of the *JPR* articles address relative deprivation. Marie Besançon examines the relationship between economic inequality and political conflict. Using aggregate regression-type statistical analysis with data from the State Failure Task Force,[2] she arrives at the counterintuitive (and thus all the more important) conclusion that economic inequality is not a predictor of genocide. Her analysis also finds ethnic conflict to be more likely when groups are economically equal; improving a group's economic stature without also addressing political and social grievances actually increases the propensity for conflict. Unfortunately, Besançon's investigation does not tell us whether political and social grievances are occasioned by improved economic conditions, nor whether the potential for conflict can be mitigated if political and social grievances are addressed without improving the equality of condition.

Helen Ware compares the determinants of conflict in Polynesia, Micronesia, and Melanesia. The article is worth reading for the wealth of experience she brings as a long-time Australian diplomat. In her conclusion, she negates the neo-Malthusian claim that population pressures on land and natural resources precipitate conflict. The second part of the conclusion, however, unfortunately posits, as an alternative explanation, the popular myth that "idle hands make work for the devil." Of course, there are many peaceful places in the world with a plethora of unemployed young men. Therefore, what other variables intervene in the particular case of Oceania? Had the author's research addressed this question, the article's contribution to the literature would have been considerably more germane.

Henrik Urdal—who co-edited this special issue with statistician Helge Brunborg—also questions the neo-Malthusian proposition. His statistical contribution finds that population pressure on natural resources is not a determinant of a state's security or its political stability. Countries with rapidly growing populations, high rates of urbanization, or large refugee populations do not face a disproportionate risk of civil war.

Urdal's finding, however, contrasts to some degree with Manus Midlarsky's analysis of genocide. Comparing pogroms committed against European Jews, Midlarsky infers that genocide is more likely when loss of territory is compounded by an influx of refugees. Still, Urdal's and Midlarsky's findings are commensurate insofar as they suggest that the environmental pressures and competition that might ensue from less land and more people are not to blame for any conflict that might arise.

Also on the topic of refugees, Stephen Lubkemann's ethnographic research in Mozambique leads him to caution against generalizing about the cause of forced migration in a given conflict. His research confirms other findings (e.g., Sambanis, 2001) that show that the same macro-conflict may have different logics of violence at the local level. It follows that addressing the problem of displaced persons during a conflict necessitates a multipronged, micro-approach to conflict resolution.

John Landers asks whether the advent of firearms had a measurable demographic impact on warfare in Europe. From his comparative historical analysis, he concludes that the demographic impact was a function of the strategies adopted by rulers rather than of the growing scale and cost of warfare. His careful research contrasts starkly with the banality of Quan Li and Ming Wen's behavioralist pretensions. Under the positivist guise of substituting sophisticated mathematical techniques for substantive depth, they arrive at the perfectly intuitive conclusion that more severe conflicts lead to greater loss of life. Their article's redeeming qualities, such as its focus on the gender differences in mortality rates in the immediate and long-term aftermath of violent conflict, are compromised by its blind faith in weak mathematical relationships. Had Li and Wen struck a better balance between pedestrian use of statistical methods and understanding the literature, they would have realized that the relationship between degree of conflict and loss of life has already been amply documented and is thus hardly novel.

In the grand scheme of things, however, the research in this special issue makes several germane contributions to the literature on the demography of conflict and violence. First, it complements a body of research that challenges neo-Malthusians to advance more nuanced claims. Second, violent causes and consequences of migration warrant our attention if we are to resolve or avert future conflict. Third, the mass destruction of human life is due less to advanced weaponry than light arms under the control of instrumentalist elites. Fourth, we should pay more attention to political and social grievances and put less emphasis on improving socio-economic well-being. Thus, environmental sustainability and relative-deprivation policies are more likely to reduce the risk of conflict and violence if they are linked to socio-political improvement.

The seven articles in this edition of *JPR* provide a good overview of many of the key

Environmental sustainability and relative-deprivation policies are more likely to reduce the risk of conflict and violence if they are linked to socio-political improvement.

debates on the relationship between demography and conflict. The edition is refreshingly interdisciplinary, spanning political science, history, anthropology, statistics, international relations, and foreign policy. The methodological pluralism is notable: quantitative and statistical work is balanced by qualitative and comparative approaches, as well as an impressive ethnographic case study. Senior scholars are joined by some very talented young scholars. The heavily gendered field of conflict studies notwithstanding, three of the seven articles are authored by women. The authors come from four continents and the research and data cover just about every corner of the globe. They hone in on different eras and investigate diverse types of conflict and violence. In other words, this even-handed volume unequivocally does justice to the topic in every conceivable way. And finally, the journal tops it all off with an excellent critical review of the most recent literature on the relationship between demography and conflict.

Notes

1. The special issue emerged from a conference on the demography of conflict and violence sponsored by the International Union for Scientific Study of Population and the Peace Research Institute of Oslo, held in Norway in 2003. The *European Journal of Population* (2005, Volume 21, Issues 2-3) has published a set of additional articles emerging from the conference that will be of greater interest to strict demographers.

2. Now known as the Political Instability Task Force; see http://globalpolicy.gmu.edu/pitf/

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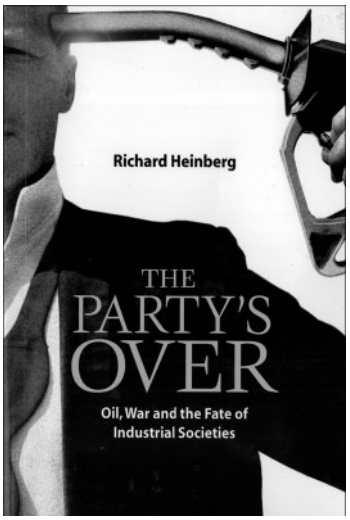

The Party's Over: Oil, War and the Fate of Industrial Societies

Richard Heinberg
Gabriola Island, British Columbia: New Society Publishers, 2003. 274 pages.

Reviewed by Michael Renner

Michael Renner is a senior researcher at the Worldwatch Institute, where he directs the Global Security Project. His main research interest concerns the intersection between resources, environment, and peace and conflict issues.

As oil prices rise, turmoil in Iraq continues, and the United States, China, and others jockey for access to oil and gas resources, energy issues are once more climbing to the top of the global agenda. But if journalist and educator Richard Heinberg is correct, these concerns are only a foretaste of far more fundamental upheavals to come.

According to Heinberg's latest book, *The Party's Over: Oil, War and the Fate of Industrial Societies,* industrial civilization as we know it—predicated on the consumption of cheap, but finite, reserves of fossil fuels—is drawing to a close, as oil production will soon peak and then begin a slow but inexorable decline. As it declines, competition for remaining energy resources will grow, prices will rise, countries will undergo wrenching economic and political changes, and the global human carrying capacity will plummet.

Mainstream energy analysts project the world's demand for oil will grow endlessly—

the typical scenario foresees a 50 percent expansion in the next 20 years—but how will that rising demand be satisfied? Heinberg points out that the rate of global oil discoveries peaked in the 1960s and that consumption far outpaces today's new discoveries. Moreover, the amount of energy required to find additional deposits keeps increasing, as the easily-extracted deposits are drained, thus squeezing the amount of "net energy" available to society. In the United States, for instance, the amount of energy extracted relative to the energy expended to find and extract oil fell from 28:1 in 1916 to 2:1 in 1985, and continues to drop.

Pioneered by petroleum geologist M. King Hubbert (1969), the concept of "peak oil" was long derided or ignored. According to Hubbert, any given oil field will reach its production peak when roughly half of the total oil in the reservoir has been extracted, followed by a steady decline in output. In the 1950s, Hubbert correctly predicted that U.S. oil production would peak between 1966 and 1972; the actual peak occurred in 1970.

While U.S. reserves have been largely depleted, conventional wisdom suggests that supplies from other regions of the world will remain abundant. But even in oil-rich Saudi Arabia key fields may be past their prime, limiting the country's ability to satisfy rising demand. The Saudis angrily deny such assertions, but have never refuted them with concrete evidence to the contrary.

The literature on this previously near-taboo subject is growing fast, but not surprisingly, there is no consensus on when oil production might peak globally. The U.S. Department of Energy (1998) expects the peak to occur near the middle of this century; Heinberg contends that it will occur much earlier—some time between 2006 and 2015.

But pinpointing when the peak will happen is less important than understanding its likely consequences and preparing for the post-peak period—and, ultimately, life after oil. Acknowledging that forecasts are necessarily speculative, Heinberg offers a range of equally pessimistic and unpalatable predictions for the post-petroleum age—in his own words, a "century of impending famine, disease, economic collapse, despotism, and resource wars" (page 199).

The end of cheap and plentiful energy will cause the world economy to sputter, producing fewer goods and services, fewer jobs, and a financial crisis. Fewer cars will be built, and only the wealthy will be able to afford them. Road building will grind to a halt and existing roads will gradually disintegrate. Air travel will become prohibitively expensive. Without abundant transportation fuels, businesses will return to local production for local consumption—globalization in reverse. And agriculture will support far smaller populations: "The agricultural miracle of the 20th century may become the agricultural apocalypse of the 21st" (page 177).

Of equal importance are the likely social and political impacts, greatly exacerbating even today's grotesque inequalities and triggering more intense struggles between empowered and disempowered groups, as well as intergenerational conflict. Coming decades will likely see more frequent and deadly conflicts over fading energy supplies. Heinberg predicts that these scarcities and pressures "will likely place ever greater stress on the already battered democratic ideals of industrial societies" (page 188). He is skeptical that large nation-states as we know them will hold together under such conditions, and he foresees the emergence of regional enclaves—which could be either democratic or authoritarian—in their place.

The era of cheap oil may have been a promised land for those—mostly the inhabitants of Western countries—who benefited from the flow of "black gold." But for many others, particularly the inhabitants of poor oil-producing countries, oil is more aptly described as the "devil's tears." A growing literature has focused on the downside of oil development. For example, in *Oil: Politics, Poverty, and the Planet*, *Financial Times* journalist Toby Shelley (2005) summarizes the social and economic distortions that have afflicted so many oil-producing countries, including growing poverty and inequality, the inability to develop a vibrant economy out-

Environmental sustainability and relative-deprivation policies are more likely to reduce the risk of conflict and violence if they are linked to socio-political improvement.

side the oil sector, massive corruption and patronage, and civil conflict.

The oil-related wars of the past and present have been essentially fought to divide the spoils. In the future, conflicts are more likely to arise to secure dwindling supplies, particularly as rising economic powers such as China and India join Europe, North America, and Japan in their voracious appetite for energy.

What about alternatives to oil? Oil is a particularly valuable commodity because it is easily transported, energy-dense, and suitable for many types of uses—and thus difficult to replace. Natural gas, coal, and nuclear energy are no saviors in Heinberg's judgment. Each comes with its own set of problems, including pollution, vexing—and perhaps irresolvable—waste disposal problems, dangers to human health, and declining net energy yield. These are valid observations, yet societies may pursue these options anyway, because industries are addicted to endless growth, irrespective of the costs.

Heinberg also throws cold water on environmentalists' sometimes cozy assumptions. Though he is in favor of pursuing wind and solar power, he cautions that it will take decades to fully develop them. Even then, electricity cannot easily provide the fuel needs of transportation and agriculture. "A Golden Age of plentiful energy from renewable sources is simply not in the cards," he says (page 4).

Could fuel cells and a hydrogen economy come to the rescue? Heinberg agrees there are reasons to be hopeful, but he scorns boosters that "occasionally exhibit a techno-utopianism of almost messianic intensity" (page 147). He warns that the transition to a hydrogen energy infrastructure would require huge amounts of time and money, and that hydrogen production always uses more energy than the resulting hydrogen will yield. And dwindling natural gas supplies will soon force decision-makers to decide whether the transition to a hydrogen economy or heating people's homes should receive priority.

Heinberg is careful to note that he is not arguing that we abandon the development of such alternatives—quite the contrary. But he emphasizes that the transition to a new energy system will entail an almost complete redesign of industrial societies and wrenching adjustments toward a "less mobile, more localized, and more materially modest society." He warns that "it is misleading to think that we can achieve that result easily or painlessly" (page 165).

The choice is not whether, but how to reduce energy use, and how to deliberately, systematically simplify society's structures: "gracefully and peacefully… or petulantly and violently" (page 230). Heinberg refers to this as a "managed collapse," as opposed to a sudden and chaotic disintegration. He does not offer (or claim to offer) novel solutions. But his provocative book is a wake-up call rousing us from our abundance-induced complacency. One does not have to share all of the author's pessimistic prognostications to agree that we urgently need fundamental changes in policy.

The political obstacles are enormous, and Heinberg acknowledges that "the vast majority of people will continue to prefer happy illusions to the stark truth," voting for candidates and parties that promise a rosy future (page 200). He laments lost opportunities for launching a transition during the past three decades. While it is now too late for a completely painless transition, Heinberg argues that it is never too late to improve the future. In an otherwise pessimistic analysis, he is cautiously hopeful that these radical shifts can occur if an informed citizenry dramatically increases its involvement. The solution, then, lies not so much in alternative technologies, but in a revitalized political process.

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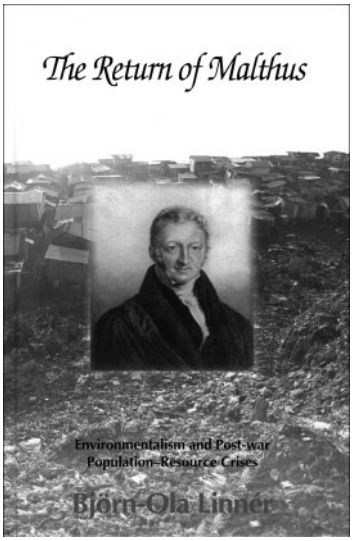
The Return of Malthus: Environmentalism and Post-war Population-Resource Crises

Björn-Ola Linnér
Isle of Harris, UK: White Horse Press, 2003. 303 pages.



Reviewed by TED GAULIN

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In the 1970s the ecologist Garrett Hardin observed that although long dead, Thomas Malthus continues to haunt each new generation of scholars (Daly, 1977, page 43). In his excellent new book, *The Return of Malthus: Environmentalism and Post-war Population-Resource Crises*, Björn-Ola Linnér explains in detail why Malthusian concerns have been raised intermittently over the past 50 years.

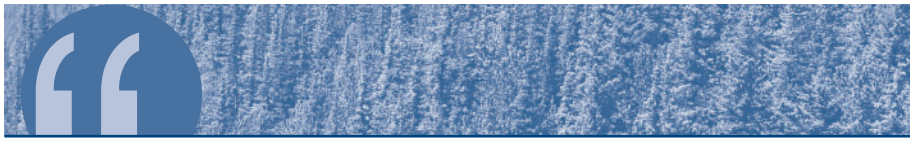
Malthus, one will recall, was an 18th century British economist and clergyman who suggested that humanity was likely to outstrip the food supply. This prediction arose from his observation that population growth increased exponentially while agricultural production increased arithmetically (Malthus, 1798). Left unchecked, human reproduction would lead to famine, instability, and war. Since the end of World War II, according to Linnér, similar Malthusian fears have risen and fallen in three waves.

The first wave emerged immediately after World War II, as hunger reigned in much of Europe and Asia. Years of war had despoiled farmland and depleted livestock; dilapidated transportation systems hindered food distribution. Parts of Europe experienced actual starvation. However, massive provisions of American food and reconstruction aid averted the worst outcomes. Within a few years agricultural production—at least in Western Europe—began to recover.

Paradoxically, even after this crisis had been averted, the fears continued. Linnér argues that political and economic factors account for the persistence of Malthusian concerns. In particular, he points to the transformation of the global economy and the geopolitical interests of the United States. The new world economy that the United States sought to construct after the war depended on a steady flow of raw materials. Political and social unrest in countries providing these materials—many of which happened to be resource-scarce—would be detrimental to this new interlinked economy.

In addition, American policymakers worried that resource scarcity in poor countries might engender political unrest and leave them ripe for a communist takeover. Thus, the issue of natural resources became vital to U.S. national security policy (page 33). Indeed, the resource-security nexus underlay Truman's Point Four Program, which specifically sought to aid underdeveloped areas. Years later, U.S. efforts to prevent famine in India was arguably another manifestation of these concerns (page 153).

After a brief interregnum of optimism in the 1950s, neo-Malthusianism returned with a vengeance in the 1960s. This second wave of Malthusian anxiety arose in part from historical circumstance: catastrophic famines in Asia and Africa killed millions, lending credence to the warnings of an impending population-resource crisis. Global food trading patterns also shifted; until World War II, many developing countries were net exporters of food. By the 1960s, they imported 13 million tons annually—consistent with the image of a looming crisis.



Linnér shows how the bulk of biotechnology research has been, and continues to be, directed towards crops for Western markets. Yet, for the last decade the biotech industry's primary arguments center on feeding the world's poor.

This wave of concern was also influenced by the growing scientific recognition that human behavior was transforming the environment. This was a new twist in the Malthusian logic: not only were the differential rates of population growth and agricultural production on a crash course, human beings were actually undermining the productive capacity of the Earth through pollution and despoliation. We were burning the environmental candle at both ends, so to speak. These developments led to an explosion of neo-Malthusian scholarship by thinkers like William Vogt, Fairfield Osborn, Julian Huxley, Garrett Hardin, and Paul Ehrlich—whose provocatively titled *The Population Bomb* (1968) became a national bestseller.

Throughout his narrative, Linnér returns to one particular neo-Malthusian thinker, the Swedish biologist Georg Borgström. Borgström is most well-known for his 1965 book *The Hungry Planet*, but he began writing passionately about population-resource issues in the early 1950s. Linnér shows Borgström to be a particularly prescient scholar whose work should be better appreciated. For example, his concept of "ghost acreage"—the amount of additional arable land a country would require in order to be able to feed itself—anticipated by 30 years the term "ecological footprint." His efforts to track food and energy flows on a global scale anticipated the full-cost accounting approach that environmental economists use today. His calls for "nutritional equalization" would be perfectly in sync with the appeals of today's environmental justice movement. In addition, his 1960s estimates of future population levels have proved—in hindsight—to be particularly accurate.

Linnér does not simply wish to raise Borgström's historical profile; he is interested in Borgström as a "conveyer of ideas" on environmental issues. A conveyer serves as a mediator between the scientific community, policymakers, and society at large. In tracing Borgström's career Linnér demonstrates how conveyers can become controversial, inciting both praise and resentment from the general public and within the scholarly community. More generally, Linnér is trying to show how Borgström's ideas—and the ideas of other neo-Malthusians—were vital to the development of a coherent environmental ideology.

A third wave of Malthusian warnings emerged in the late 1990s. Linnér describes this most recent cycle as the product of discursive arguments employed by large plant-breeding corporations to promote their genetically modified (GM) crops. In the author's view, biotechnology companies like Monsanto, Pioneer, and Novartis have revived Malthusian rhetoric in the hope of gaining public support for GM crops. For example, Monsanto's public relations literature ominously warns: "World population is soaring, yet the amount of arable land available for food production is diminishing. New agricultural technology has never been more urgently needed" (page 203). This is an interesting argument, and Linnér should be credited for pointing out the duplicity of this rhetoric. He shows how the bulk of biotechnology research has been, and continues to be, directed towards crops for Western markets. Yet, for the last decade the biotech industry's primary arguments center on feeding the world's poor.

Linnér's focus on the discourse of the biotech industry causes him to overlook a larger, more significant source of neo-Malthusianism in the 1990s; namely, the extensive research conducted throughout that decade on the issue of environmental scarcity and conflict. Research by Thomas Homer-Dixon's (1991, 1994, 1995) project at the University of Toronto, Günther Baechler's (1998) project at

the Swiss Peace Institute, and a number other organizations on the potentially violent consequences of the depletion of renewable natural resources reintroduced neo-Malthusianism into the political discourse in the 1990s.[1] This research, communicated to policymakers through a few highly influential articles, put neo-Malthusianism on the post-Cold War map.[2] This research set the stage for the biotech industry to use a Malthusian discourse.

This point highlights the one shortcoming of *The Return of Malthus*: its failure to engage with the large and pertinent literature on the security implications of environmental change. In fact, the readers of this journal will be surprised to learn that Linnér never refers to Homer-Dixon or Baechler. Nor does the book reference those who criticize some environmental security texts as overly Malthusian. This is a strange omission, since Linnér had already made the scarcity-security connection in his discussion of the immediate post-World War II era. Why not explore whether those same dynamics were at work immediately after the Cold War, when the environmental security research agenda took shape? One wonders if Linnér, who has carefully analyzed Malthusianism from a historian's perspective, would classify key thinkers like Homer-Dixon as neo-Malthusian.

This shortcoming, however, hardly dilutes the power of *The Return of Malthus*. The book is a strong work of scholarship that demonstrates that population-resource debates date back much further than those taking place within the environmental security community today. And it demonstrates that Malthusian thought—right or wrong—has had a powerful effect on the development of the environmental movement.

Notes

1. To be sure, many of the scholars associated with these projects would renounce the Malthusian label. But the connection these researchers make among growing populations, dwindling resources, and frequently bleak outcomes gives much of this work an undeniable Malthusian cast. On the Malthusian nature of Homer-Dixon's work, for example, see Peluso and Watts (2001).

2. For a detailed analysis of how the environmental security paradigm took shape see Richard Matthew (2002).

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Scarcity and Surfeit: The Ecology of Africa's Conflicts

Jeremy Lind and Kathryn Sturman (Eds).
Pretoria, South Africa: Institute for Security Studies, South Africa, 2002. 388 pages.

Reviewed by BIDISHA BISWAS

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In the past decade, the links between natural resources and violent conflict—particularly in the resource-rich but conflict-ravaged countries of Africa—have garnered increased attention. Controversial research, led by Paul Collier and his associates at the World Bank (see, for example, Collier et al., 2003), argues that conflicts are more likely to be caused by economic opportunities—greed—rather than grievances. This argument contrasts with earlier studies, such as those by the Ted Robert Gurr (1968; 2000), which argue that social, political, and economic deprivation, inequities, and grievances are the main causes of political violence. The August 2005 issue of *Journal of Conflict Resolution* contains a series of articles exploring and critiquing aspects of the resource-based explanations of violent conflict (e.g., Ron, 2005), illustrating the importance of understanding such links.

Jeremy Lind and Kathryn Sturman, editors of *Scarcity and Surfeit: The Ecology of Africa's Conflicts*, have compiled six case studies in two volatile regions of Africa, the Greater Horn (Somalia, Ethiopia, and Sudan) and the Great Lakes (Burundi, Rwanda, and the Democratic Republic of the Congo). The contributors challenge the distinction between greed and grievance, naming structural inequalities, resource mismanagement, and predatory states as among the principal causes of conflict. While the quality of the case studies is uneven, the authors all agree that resource-based factors play an important role in sustaining conflicts in Africa. At the same time, they carefully emphasize that ecological issues are rarely the main causes of civil discord.

The chapters on Rwanda, Burundi, and Somalia persuasively examine how economic issues, particularly land distribution, play significant roles in conflicts traditionally viewed as driven by ethnicity. Jean Bigagaza, Carolyne Abong, and Cecile Mukarubuga argue that Rwanda's political violence was greatly influenced by competition to control scarce land. Unfortunately, peace-building attempts in the region (e.g., the Arusha peace process) placed undue emphasis on the ethnic dimensions of the conflict. As a result, the remedies focused on institutional solutions such as sharing power, holding elections, and adjusting the ethnic composition of the armed forces. These efforts lacked concerted attempts to tackle unequal land distribution, the decreasing international value of agricultural commodities, and deepening rural poverty.

The Burundi case study makes a similar argument. Like Rwanda, Burundi must cope with the problem of land scarcity, which is accentuated by the country's dependence on its main natural resource, coffee. The Burundi state is predatory and rent-seeking; controlling the state means controlling coffee production and export. In Somalia, too, the interplay between local and

national competition for land influences politics. To help build peace, all three countries need greater consideration of land usage patterns and policies that emphasize sustainable natural resource use and management.

The war-ravaged Democratic Republic of the Congo (DRC) illustrates the tragedy of the "resource curse." Though the country is richly endowed with high-value natural resources, 70 percent of its population lives in absolute poverty. Celine Moyroud and John Katunga investigate the deleterious effects of coltan extraction, which is concentrated in the eastern part of the country.[1] While coltan extraction is not the sole—or even primary—cause of conflict, it is an aggravating factor, as it contributes to environmental degradation and tensions over land ownership and utilization—and generates revenues for rebel groups. The authors provide some interesting insights into the politics of natural resource extraction in DRC; for example, trade in coltan is controlled almost entirely by Rwandan brokers. Policymakers might benefit from heeding the chapter's suggestions. For example, the authors favor an international code of conduct to monitor the extraction and purchase of coltan, but they also argue that this issue must be addressed within the wider context of the conflict.

Writing on Sudan, Paul Goldsmith, Lydia A. Abura, and Jason Switzer counter identity-based interpretations of conflict by arguing that resource mismanagement, exploitation, repression, and the absence of community participation in decision-making have all sharpened divisions in the country—to the point that conflicts would have occurred even if the country's people shared one religion. While the authors challenge ethnicity-based explanations of civil war, a clearer discussion of the role of environmental factors, such as the availability of water or oil and the specific links between their exploitation and conflict, would have strengthened the chapter.

Fiona Flintan and Imeru Tamrat examine the role of water scarcity in exacerbating conflicts in Ethiopia, underlining the importance of local capacity in resolving or mitigating resource-based conflicts. Community elders and religious leaders manage access to and distribution of resources. According to traditional norms, clan resources are often shared in times of resource scarcity or stress. Clan leaders also help adjudicate conflicts and appeal to the government in the event of larger conflicts. Traditional peace-building institutions have worked with the government to hold peace conferences in the Afar region. In addition, women often act as mediators between competing clans and play important roles in conflict prevention and resolution. While the authors provide some fascinating insights, the article needs a tighter focus on the impact of water issues on the situation, and an analysis of the strengths and limitations of localized conflict management efforts, particularly in disputes between Ethiopia and Eritrea.

The case studies compiled in this volume persuasively argue that structural inequalities, particularly land distribution, are key determinants of conflict in Africa. Rather than blaming violence solely on opportunistic criminals, these studies examine how state power can become an arena of conflict over material resources. Many of the authors suggest that building local capacity to effectively utilize resources would be a useful way to challenge predatory states. A close examination of local or national initiatives that have contributed towards peacemaking and peace building would help these efforts.

The causal process of conflict is complex, and, as these case studies make clear, environmental factors are only one dimension of political violence. By examining how resource issues can harden ethnic divides (or vice versa), we can enhance our understanding of the interplay of conflict's economic, social, and political determinants. However, we need more systematic empirical research to understand the precise role of resource-based issues. In the concluding chapter, Richard Cornwall calls for more critical and innovative research on the subject. Indeed, attempts to prevent, manage, and resolve conflicts can greatly benefit from efforts by the research and policy communities to understand, as clearly as possible, the role of ecology in conflicts in Africa and elsewhere.

The contributors challenge the distinction between greed and grievance, naming structural inequalities, resource mismanagement, and predatory states as among the principal causes of conflict.

Notes

1. Coltan (short for columbite-tantalite) is a key ingredient in capacitors for cellular phones. The technology boom caused the price of coltan to soar, but it settled down after 2002. However, other resources have since become new targets (see Balint-Kurti, 2005).

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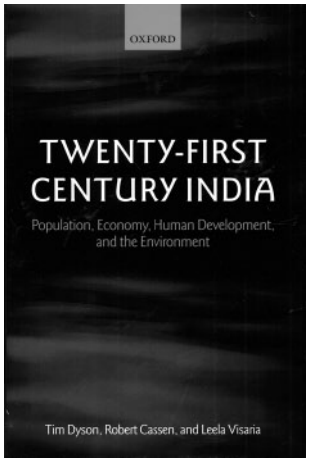
Twenty-First Century India: Population, Economy, Human Development, and the Environment

Tim Dyson, Robert Cassen, and Leela Visaria (Eds.)
Oxford: Oxford University Press, 2004. 414 pages.

Reviewed by TOUFIQ A. SIDDIQI



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The comprehensive and excellent book *Twenty-First Century India: Population, Economy, Human Development, and the Environment* is the outcome of a research project "designed to examine the nature and consequences of the future growth of India's population" (page vii). The book's editors—Tim Dyson and Robert Cassen of the London School of Economics, and Leela Visaria of Delhi's Institute of Economic Growth—have achieved this ambitious goal.

The volume's 16 chapters can be grouped into 3 sections. The first describes past, present, and future trends in India's population growth, while the middle section examines the implications of this growth for education, employment, poverty, and the economy. The last third of the volume outlines major challenges that India faces in meeting its requirements for food, water, and energy, as well as the implications for the environment. The final chapter discusses the lessons learned, and suggests policies to address these challenges. The 14 authors, most of them based in the United Kingdom (the rest

mainly in India), bring a variety of disciplinary backgrounds to bear on the topics, resulting in a rich diversity of approaches.

Past, Present, and Future Trends in India's Population Growth

With a current population of more than 1 billion, it is hard to imagine that India had only 251 million people in 1921. Due to high mortality from infectious and parasitic diseases, epidemics, and famines, preceding centuries witnessed only a small growth rate (Visaria & Visaria, 1982). Improved health care led to a rapid decline in mortality after 1921, and attention turned to the country's high birth rate. Consequently, in 1952 India became the first country to officially adopt a family planning program, but it was not until the 1990s that the birth rate began to fall significantly faster than the death rate.

The chapter "Mortality Trends and the Health Transition" provides tables detailing not only the overall death rates during the last part of the 20th century, but also the impact of specific communicable diseases, such as tuberculosis (TB) and typhoid. The resurgence of malaria, the spread of drug-resistant TB, and the rapid rise in HIV/AIDS indicate that despite considerable progress communicable diseases are still major contributors to mortality.

Many of the book's tables provide state-level data rather than country-level aggregates—a particularly useful feature in a country as vast as India, where regions differ considerably. Policies must be designed to take social, cultural, and economic differences into account. In his chapter on India's future population, Dyson projects a total population of about 1.4 billion by 2026 and more than 1.5 billion by 2051. Uttar Pradesh and Bihar (in their former borders) will continue to have the largest populations during the next 50 years.

Education, Employment, Poverty, and the Economy

The much-discussed "outsourcing" of software and other services to India by the United States is one indicator of India's enormous progress in providing quality education to ever-larger numbers. The overall literacy rate has climbed to 65 percent, but a third of the population is still illiterate. As in many other developing countries, poorer children and girls have access only to lower-quality schooling. *Twenty-First Century India* provides a wealth of information on education-related topics, such as school attendance and literacy rates, in various states and age groups.

Although the Indian economy grew fairly rapidly during the 1990s, unemployment has also increased, due to privatizations of state enterprises and the introduction of modern technologies, among other factors. Kirsty McNay, Jeemol Unni, and Cassen, in their chapter on employment, estimate that eight million people will join the work force every year for the next 20 years. Even if the Indian economy grew by eight percent a year during that period, unemployment is still likely to increase—a serious and growing problem that policymakers should address.

Poverty is defined these days not only as lack of income, but also as lack of education, health care, and other important components of the quality of life. The analysis undertaken in the education chapter confirms the prevalent view that inequalities in many fields are large and growing, both within and between states. In their chapter on education and literacy, Geeta Gandhi Kingdon, Cassen, McNay, and Visaria conclude that five large states—Bihar, Madhya Pradesh, Orissa, Rajasthan, and Uttar Pradesh—suffer more than their fair share of poverty, inadequate health care, and malnutrition. They also find large gaps between religious groups, and between the mainstream population and cultural minorities.

During the 1990s, India's economy increased about six percent per year; the states of Gujarat and Maharashtra grew the fastest, with Rajasthan not far behind. In the chapter "The Economy, the Past, and the Future," Shankar Acharya, Cassen, and McNay ascribe this growth to the states' reform of infrastructure, industrial policy, and investment incen-

tives, which echoes the conclusions of other analysts (e.g., Bajpai & Sachs, 1999). They also address a question seldom explicitly discussed: how might environmental degradation affect economic growth? The authors estimate that India's annual losses due to environmental damage range from 2-9 percent, depending on different estimates of the impacts on human health and the value assigned to human life.

Major Challenges

Twenty-First Century India also addresses the opposite and more traditional concern: the impact of economic growth on the environment. Based on the results of a model that links real GDP to emissions from energy production and use, Dennis Anderson makes five propositions:

- Addressing environmental problems will improve, not reduce, India's economic prospects;
- If environmental policies were in place, the "population effect" would be relatively small;
- The worst environmental problems affect the lowest income groups the most, and environmental policies will therefore help them the most;
- Technical progress, and policies that induce it, are the most important factors in promoting growth along with improving the environment; and
- Environmental problems should be addressed sooner rather than later.

Anderson provides case studies to support these propositions, and uses computer simulation models to predict emissions of pollutants under various scenarios. His findings are generally in agreement with those of several other studies (e.g., Grubler, 1998; Pachauri & Sridharan, 1998). He recommends eliminating subsidies for rural electrification and for coal-fired and nuclear power, which would not only provide economic benefits, but also help reduce the pressure on groundwater resources.

As in other rapidly growing developing countries, India's environment has deteriorated—particularly in the urban areas—due mostly to the use of fossil fuels for transportation, power generation, industrial activities, and domestic needs. Many of India's largest cities rank among the most polluted in the world. The chapter "India's Urban Environment, Current Knowledge, and Future Possibilities" predicts that these negative trends—as well as the problems of municipal solid waste, sewage, and shortage of safe drinking water—will continue, and that environmental quality in urban areas will become increasingly problematic for India.

Water, agriculture, and food are closely related. While short, the chapter on water by Bhaskar Vira, Ramaswamy Iyer, and Cassen addresses several important issues, including the possible effects of climate change. Climate modeling is still not precise enough to predict the magnitude and direction of changes in rainfall and temperature at the state level, but such changes will likely occur by the middle of this century. Thus, policymakers should begin contingency planning soon. Many parts of India already suffer water shortages, especially during the dry months, which have led to conflicts between states and between end-users. The authors summarize the demand for water through 2050, concluding that India can avoid a water crisis if appropriate supply- and demand-side measures are adopted in time.

The chapter points out that some states' policy of providing free water and electricity has led to overuse of surface and ground water. Political parties have been unwilling to incur farmers' wrath by eliminating or reducing this costly subsidy. Since water comes under the jurisdiction of the state rather than the central government, the latter can only intervene in the cases of rivers that flow across state borders.[1]

Cereal production in India has increased faster than the population during the past 50 years. In "Prospects for Food Demand and Supply," Amresh Hanchate and Dyson assert that this trend may continue for the next few decades, if some policy changes, such as increasing the price of water and electricity, can be implemented. While this may be true for the

As in other developing countries, implementing policies in India that create some hardships will take time, education, and a social safety net.

country as a whole, over a long-term horizon, regions can fluctuate considerably from one year to another. Global climate change could also affect future cereal production.

Common pool resources (CPR)—which include fuel wood, fodder, crop wastes, cow dung, organic manure, and small timber, as well as local fisheries and water for drinking, cooking, and irrigation—are closely linked to India's rural economy. Vira's chapter on CPR describes the conflicting claims on these resources by, for example, the forest product and chemical industries.

Lessons Learned

In the final chapter, "Lessons and Policies," the editors outline the policies that they consider to be especially important for meeting India's challenges. While the government has already articulated policies and legislation for the issues discussed in the book, difficulties arise in their implementation. Policymakers in many developed as well as developing countries face this problem, so it is no surprise that the authors offer no magical solutions. For example, while many parts of India suffer from water shortages, the agriculture sector uses a great deal of water, which is essentially provided free of charge. No political party is willing to advocate charging money for water, for fear of being voted out in the next election. Similarly, closing down a factory for polluting—even temporarily—is likely to lead to widespread demonstrations and strikes. As in other developing countries, implementing policies in India that create some hardships will take time, education, and a social safety net.

Despite the lack of new policy recommendations, *Twenty-First Century India* is an insightful and comprehensive book that should be of great value to academics, policy advisors, and researchers interested in exploring the demographic and sustainable development challenges facing the second most populous country in the world.

Notes

1. Readers interested in examining these issues in greater detail should refer to a number of recent works, such as Shiva (2002) and the two volumes edited by Siddiqi and Tahir-Kheli (2004, 2005).

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Online resources for data on HIV/AIDS

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AIDS Epidemic Update: December 2005

UNAIDS
http://www.unaids.org/Epi2005/doc/report.html

UNAIDS lists its most recent estimates of HIV prevalence and AIDS mortality, country by country. With maps and regional summaries, the 2005 edition explores new trends, including evidence that adult HIV infection rates have decreased in certain countries, in large part due to changes in behavior to prevent infection—such as increased use of condoms, delay of first sexual experience, and fewer sexual partners. A special section on HIV prevention looks at intensive efforts to reduce transmission, but despite their success, overall rates of HIV transmission continue to increase in all regions of the world except the Caribbean.

Population, Development, and HIV/AIDS, with Particular Emphasis on Poverty: The Concise Report (2005)

UN Population Division
http://www.un.org/esa/population/publications/concise2005/PopdevHIVAIDS.pdf

The UN Population Division examines the relationship between poverty and HIV prevalence to illustrate how poverty not only exacerbates the impact of HIV/AIDS but is also a key factor leading to behaviors that expose people to the risk of HIV infection. Globally, the UN finds the highest prevalence of HIV in poor countries, but within regions such as Africa, the poorest countries do not necessarily have the highest rates. Data resources include demographic and poverty indicators, among others, grouped by both region and level of HIV prevalence.

Population and HIV/AIDS 2005: Wall Chart

UN Population Division
http://www.un.org/esa/population/publications/POP_HIVAIDS2005/POP_HIVAIDS.htm

The extensive tables in this wall chart display country-level data on HIV/AIDS, with a special focus on government policies and programs for the prevention and treatment of the disease. It tracks five government measures for each country, in addition to per capita expenditures on health. Other datasets report HIV prevalence; demographic indicators impacted by AIDS; number of AIDS orphans; and condom usage.

Financing the Response to HIV/AIDS in Low and Middle Income Countries: Funding for HIV/AIDS from the G7 and the European Commission

Kaiser Family Foundation
http://www.kff.org/hivaids/7344.cfm

The Kaiser Family Foundation's detailed overview of donor financing for HIV/AIDS programs includes the latest data on funding commitments and disbursements by the Group of 7 and the European Commission, the largest international donors for HIV/AIDS through their bilateral programs and contributions to the Global Fund to Fight AIDS, Tuberculosis, and Malaria. The report—which suggests that despite these commitments the funding gap continues to grow—also examines several ways to assess "fair share" among donors.

Combating AIDS in the Developing World: Report of the UN Millennium Project's Working Group on HIV/AIDS

UN Development Programme
http://www.unmillenniumproject.org/documents/HIVAIDS-complete.pdf

The Working Group on HIV/AIDS draws on existing data and research to examine strategies for achieving the Millennium Development Goal (MDG) to halt the spread of HIV/AIDS by 2015. Chapters of the report address the scope of the epidemic, prevention, treatment, AIDS orphans, and financing. The report offers 10 imperatives for meeting the MDG, including rapidly scaling up essential HIV prevention and antiretroviral treatment through sustained investment in health systems.

Please visit http://www.wilsoncenter.org/ecsp for more population, health, environment, and security links.

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