Linkages Between Environment, Population, and Development

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What Is the Problem?

Environmental problems—the overuse of natural resources and the degradation of ecosystems—are increasingly understood to play an important role in increasing human vulnerability, undermining livelihoods and human well-being, creating instability, and potentially generating or exacerbating violent conflict. The depletion of water resources, overfishing, degradation of arable land, decimation of forests, and alteration of natural cycles and ecosystems are among the principal concerns. Climate change is likely to augment these challenges. Different environmental problems can be traced to various roots, but common underlying causes typically include overconsumption in the world's richer nations and communities, demographic pressures in poorer societies, and distributive inequities in both the global North and South.

Although environmental change threatens all of humanity, people living in the developing world are often the most vulnerable to its effects, as large portions of these populations are directly dependent on activities such as agriculture, forestry, and fishing for their well-being and survival. These activities depend on healthy ecological systems, and there are few buffers to protect the poor from the repercussions of environmental decline.

In at least some cases, environmental change can be a factor in generating or exacerbating violent conflicts. But scholarly research shows that environmental change is never a single cause of conflict. Environmental issues are part of a complex mix of factors and pressures that vary in composition and dynamics from country to country. Persistent poverty, growing income inequality, population growth, job shortages, and disease burdens are key additional concerns. This potent combination is placing severe stress on the social fabric of many communities, leading to political strife in a number of countries, and even to devastating violence in some.

Environmental challenges do not respect human-drawn boundaries, and indeed some—air pollution, climate change-related repercussions, and water scarcity among them—are international or even global in nature. Many analysts have cited rising water demand and conflicting claims to this increasingly scarce resource as a possible cause of future interstate armed conflicts over shared rivers. But it is by no means a foregone conclusion that violence,

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rather than negotiated solutions (e.g., working out water-sharing agreements and joint watershed management), will result. On the whole, environmentally induced conflict is more likely to occur within, rather than between, countries. Growing water scarcity, for instance, has caused internal disputes and, in a few cases, even violent confrontations in several countries, including China, India, the Central Asian states, Mexico, the United States, and Spain.

There are a number of pathways through which environmental degradation can translate into greater vulnerability, instability, and conflict:

Security Conflicts: Scarcity-related disputes may arise over access to renewable natural resources such as water, arable land, forests, and fisheries. This may be the result of tight supplies (depletion or degradation of natural resources), an unsustainable increase in demand owing to population pressures or increased per capita consumption, distributive inequities, or a combination of these factors. Disputes may arise among different communities and regions, and among contending groups that depend directly, though in different ways, on the health and productivity of the natural resource base. Farmers, nomadic pastoralists, ranchers, and resource extractors may find themselves in competition with one another, as happened in a number of recent cases, including conflicts in Rwanda, Sudan, the Chiapas state of Mexico, and elsewhere.

Different social groups and communities experience the effects of environmental degradation unevenly. These divergences can reinforce social and economic inequities or deepen ethnic fault lines, thereby exacerbating existing polarization. It is not a given that the repercussions of environmental degradation will lead to armed conflict. But they do sharpen hardships and burdens, heighten the desperation of those affected, and reinforce the perception that many disputes are of a "zero-sum" nature.

Resource Wealth Conflicts: At the other end of the spectrum from environmental scarcity, resource wealth is also a potential source of conflict. Control over petroleum deposits has been a factor in the sequence of wars that have afflicted Iraq and its neighbors since the late 1970s. Access to oil will likely continue to be a contentious issue as industrialized and industrializing nations grow increasingly dependent on imports. Oil, along with other commodities such as timber, diamonds, and various metals and minerals, has fueled armed conflict in Colombia, Angola, Sierra Leone, Sudan, the Democratic Republic of the Congo, and Burma, by providing governments, rebels, and warlords with the funds necessary to buy arms and maintain fighting forces.

Natural resources play a role in violence in other ways as well. Large-scale mining and logging projects are often characterized by a highly unequal distribution of benefits and burdens. Typically, a small group of domestic elite and foreign investors capture the bulk of the revenues, whereas local communities (often indigenous groups) bear the potential burdens, including expropriation of land, disruption of traditional ways of life, destruction of arable land, forest clear cutting, and disruption of fishing and hunting grounds. Typically, local communities are neither consulted during the planning of such projects nor compensated for their losses, and their grievances often go unheard. Frustration over this situation has led to a number of skirmishes in recent years, such as those in Nigeria and Indonesia.

Food Insecurity: A substantial portion of the world's farmland, estimated at 10 percent to 20 percent worldwide, is degraded to varying degrees. In developing countries, cropland degradation has accelerated in the past 50 years and now affects about one-quarter of total arable land. In many areas of the world, groundwater is pumped at unsustainable rates and groundwater quality is deteriorating. Portions of sub-Saharan Africa, Asia, and the Middle East are already suffering from water scarcity. Climate change is expected to intensify these problems by shifting vegetation zones and increasing the frequency and intensity of droughts.

These pressures translate into reduced agricultural productivity and greater food insecurity, and thus to increased malnutrition in the

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poorest countries. These effects are particularly pronounced where population growth is strong and land distribution is highly unequal. In such situations, small-scale and landless farmers are often compelled to cultivate steep slopes, areas cleared from rainforest, or other unsuitable patches of land. The soil productivity of these areas tends to be exhausted relatively swiftly, forcing people to seek opportunity elsewhere, sometimes in distant cities or even in other countries.

Disease: Illness and death from disease can in some cases be sufficiently severe to undermine economies and threaten social stability. Environmental factors play an important role in the transmission of and human susceptibility to a range of lethal diseases. It is estimated that more than three million people currently die each year from water-borne diseases. Societies across the planet are confronting a resurgence of infectious diseases. Exposure to previously unknown diseases is growing as human encroachment on tropical forests brings people closer to disease vectors. Logging, road building, dam construction, and climate change also enable known diseases to spread to previously unaffected areas. The building of large-scale dams encourages the spread of schistosomiasis. Warmer temperatures and increased precipitation related to climate change facilitate the bac-

teria that cause diarrheal diseases and are helping to extend the geographic reach of mosquitoes that transmit malaria and dengue fever.

Environmental factors are not at work alone. The spread of pathogens is also facilitated by growing international travel and trade, migrant populations, and the social upheaval inherent in refugee movements. And drug-resistant strains of certain diseases are developing in part because of the overuse of antibiotics in human medicine and animal husbandry. In many developing countries, infectious diseases such as malaria, tuberculosis, and HIV/AIDS, along with respiratory diseases, are overburdening fragile health systems and weakening families and communities.

Disasters, Inhabitability, and "Environmental Refugees": Population movements—induced in part by environmental change—can contribute to instability and conflict. The influx of people into another region or state often imposes a considerable burden on the receiving area through increased pressures on land, water, jobs, communal facilities, and social services. This is especially true if the influx is sudden and massive, and if political leaders or challengers are eager to capitalize on the situation by stirring up xenophobic resentments.

The decay of ecosystems has set the stage for more frequent and more devastating "unnatural" disasters: natural disturbances made worse by human actions. The poor, especially, have inadequate protection against extreme weather events. The past 50 years have seen a dramatic increase in major disasters. More than two billion people worldwide were affected in the 1990s, and the economic toll during that decade was more than that of the previous four decades combined. The experiences of the last few years suggests that the pace is likely to accelerate, especially as climate change translates into more intense storms, flooding, heat waves, and droughts.

The effects of disasters and environmental degradation may in some cases be sufficiently extreme to undermine the habitability of a given area, triggering an exodus of "environmental refugees." Environmental calamities are

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already contributing to the displacement of large numbers of people, though reliable numerical estimates do not exist. In addition, huge numbers of people are being uprooted by large-scale infrastructure projects. During the 1990s alone, tens of millions of people worldwide lost their homes to make way for dams, roads, logging operations, and other projects. The World Commission on Dams estimates that 40 million to 80 million people have been displaced by dams.

What Can Be Done?

Countries, communities, private enterprises, and civil society actors can employ many strategies to address the complex linkages between environment, population, development, and security. A multifaceted strategy is needed, including the following elements:

Promote renewable energy and energy efficiency. More aggressively promoting renewable energy and energy efficiency could substantially reduce reliance on oil and other exhaustible energy resources that contribute to global climate change and fan geopolitical tensions and civil wars. Renewable energy technologies are developing rapidly, with global wind power capacity tripling since 1998 and climbing more than tenfold over the last decade. And people living in developing countries could save up to 75 percent of their energy by incorporating more energy efficient cooking and heating technologies.

Combat land degradation and improve water productivity through sustainable agricultural practices and other techniques. A range of sustainable agriculture practices can be employed to combat land degradation, including improving fertilization practices, planting tree crops, and shifting to "no-till" farming practices. With agriculture using about 70 percent of all the water taken from rivers, lakes, and underground aquifers, less water-intensive farming methods could greatly improve water productivity. In general, water scarcity can be reduced by increasing the efficiency of private water use, decreasing leakage during water distribution, and reforming agricultural practices to lower water inputs.

Reduce population growth rates by providing widespread access to family planning, encouraging girls' education, and empowering women. Slowing population growth rates can help reduce local pressures on natural resources, and thereby reduce scarcity-induced tensions. Countries that go through a demographic transition—from high birth and death rates to lower birth and death rates—are marked by higher life expectancies and smaller family sizes. They have a lower likelihood of civil conflict and tend to fare better economically. This transition can be encouraged by expanding girls' educational opportunities, improving maternal and child health, and providing the resources necessary to allow women to choose the timing and frequency of pregnancy.

Safeguard ecosystems on which the poor depend, such as forests, watersheds, arable land, and fisheries. The poor are extremely dependent on local resources for their well-being and survival, as they cannot afford to purchase adequate shelter, food, and fuel. Safeguarding ecosystems ensures that vital ecosystem services such as air and water purification, pollination, climate stabilization, and erosion control are protected, thereby minimizing the potential for conflict over resource scarcity.

Develop certification systems for natural resources that use consumer power to discourage illegal trade and promote sustainable harvesting. Recent years have brought a heightened sensibility on the part of individual consumers to the ties that bind them, through global product chains, to people and communities in distant lands, along with the development of new tools that aid them in acting on this awareness, such as international labeling and certification systems. One example is the impact of the Forest Stewardship Council (FSC), established in 1993 to set standards for sustainable forest production. A decade later, the FSC had certified over 39 million hectares of commercial forest in 58 countries, more than 6 times as much area as in 1998, although this still only amounts to 2 percent of the world's

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forests. A Marine Stewardship Council that certifies fish products was established a few years later, and similar efforts are underway for other resources and economic sectors, such as the Kimberley Process certification program that seeks to ensure that diamond revenues do not finance armed conflicts. In the years ahead, greater efforts will be required to integrate conflict prevention and sustainability goals in Natural Resource Certification Initiatives.

What Is the Appropriate Role for the UN and Other International Organizations?

The UN and other international institutions have critical roles to play in spearheading these strategies and initiatives at the international level, including through the following activities:

Facilitate the negotiation and implementation of international environmental treaties and promote regional environmental cooperation. Existing international environmental treaties cover a broad range of issues relevant to environmental security, including climate change, cooperative water management, land degradation and desertification, and biological diversity. But most environmental treaties contain few specific targets and timetables, and provisions for monitoring and enforcement are generally weak to nonexistent. And several important environmental treaties have not yet been ratified by enough countries to enter into legal force, including the 1997 Kyoto Protocol to the UN Convention on Climate Change.[1] The UN Environment Programme (UNEP) and other UN agencies can continue to assist countries with negotiating and implementing relevant international agreements and actions plans, and encourage them to move forward with ratification. The UN can also promote greater regional environmental cooperation to protect shared river basins and other ecosystems. Working together to protect shared resources could build a spirit of cooperation rather than competition and conflict even among traditional adversaries, possibly advancing regional cooperation.

Accelerate efforts to achieve the Millennium Development Goals (MDGs) and the sustainable development targets contained in action plans from the World Summit on Sustainable Development (WSSD) and other major UN conferences. Recent years have seen governments adopt a number of important goals and targets related to poverty reduction, environmental sustainability, population stabilization, and women's empowerment that would help promote greater human and environmental security. The MDGs, for instance, call for eliminating gender disparity in primary and secondary education and halving by 2015 the share of the world's people living in extreme poverty and lacking access to clean drinking water. The WSSD Plan of Implementation reiterated the importance of the MDGs and contributed a number of new international targets, including halving the proportion of people without access to basic sanitation by 2015, restoring fisheries to their maximum sustainable yields by 2015, and reducing the loss of biological diversity by 2010. The UN has an important role to play in working in concert with civil society and other actors to galvanize action to achieve these goals.

Fund environmental and social initiatives in the developing world. Translating existing environmental treaties and sustainable development action plans into greater on-the-ground action will require funding for international environmental institutions and initiatives such as the Global Environment Facility (GEF) and UNEP. The GEF commits an average of $300 million per year to grants for global environmental protection initiatives in the developing world and UNEP has an annual budget of roughly $100 million. But raising even these relatively small sums from donor governments has proven to be a continuing challenge. Other relevant international institutions and initiatives have also suffered from scarce funding, including efforts to provide universal access to basic reproductive health services for all by 2015, as called for at the 1994 International Conference on Population and Development in Cairo. Meanwhile, global military expenditures

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currently add up to more than $800 billion annually.

Build environmental initiatives into post-conflict reconstruction efforts. Environmental damage incurred during armed conflicts slows the delivery of humanitarian aid and can also hinder redevelopment efforts. UNEP has documented the environmental damage in post-conflict Serbia and Montenegro, Afghanistan, and Iraq. Using such information, environmental protection should be integrated into the post-conflict reconstruction process. Methods for encouraging environmental protection include conducting environmental impact assessments, using environmentally friendly technologies, and maximizing information exchange between key stakeholders to avoid further risks to human health and the environment.

Promote open and transparent governance. Protecting environmental security requires open and transparent governance systems that discourage corruption and allow people affected by environmental damage to have a voice in decision-making. Toward this end, Principle 10 of the Rio Declaration on Environment and Development that emerged from the June 1992 Earth Summit stipulates that individuals are entitled to access information and judicial proceedings, as well as to be involved in decision-making. Six years later, this concept was enshrined in the legally binding June 1998 Aarhus Convention on Access to Information, Public Participation in Decision-making, and Access to Justice; other regional initiatives on public participation are under way in Latin America and in East Africa. The UN could encourage countries to abide by Principle 10 and take steps to ensure that UN processes and institutions themselves operate in a transparent and participatory manner.

Notes

1. Editor's note: Russian President Vladimir Putin signed the Kyoto Protocol on November 5, 2004, clearing the way for the international treaty to take effect in February 2005.