

## ENVIRONMENTAL SECURITY: WHAT'S NEW AND DIFFERENT?\*

Norman Myers

*"Few threats to peace and survival of the human community are greater than those posed by the prospects of cumulative and irreversible degradation of the biosphere on which human life depends. True security cannot be achieved by mounting buildup of weapons (defence in a narrow sense), but only by providing basic conditions for solving non-military problems which threaten them. Our survival depends not only on military balance, but on global cooperation to ensure a sustainable environment."*

Brundtland Commission Report, 1987

*"Sustainable development is a compelling moral and humanitarian issue, but it is also a security imperative. Poverty, environmental degradation and despair are destroyers of people, of societies, of nations. This unholy trinity can destabilise countries, even entire regions."*

Colin Powell, 1999

This review seeks to assess the latest state of play in the Environmental Security (ES) arena, and to summarize how the issue has developed since its first emergence in the mid-1970s. After it became established in the mid-1980s, notably through a chapter in the Brundtland Report, there was somewhat of a lull in professional assessment until the mid-1990s when it attracted renewed interest. Moving on to today, what is "new"--and how could it become newer still?

I first raised the concept of ES in the mid-1970s when I wrote a report for the Organization for African Unity on the Ogaden war between Ethiopia and Somalia. The war had been caused in major measure by deforestation and soil erosion, plus runaway population growth and poverty, in the Ethiopian highlands, which triggered widespread famine followed by a mass migration from the highlands toward the lowlands and hence toward the Ogaden--which Somalia viewed as prelude to an invasion.

\* Based on a policy backgrounder for the University of Peace, 2002

This opening presentation of the concept was confirmed in the late 1970s by the architect of the 1967 Israel victory in the Six Day War, General Moshe Dayan. He assured me that a prime motivation for the war, on top of General Nasser's manoeuvrings, was the threat by Syria and Jordan to sequester a good part of the River Jordan's flows--a threat viewed by Israel as a sufficient casus belli. Around the same time, moreover, Ethiopia was asserting its plan to divert much of the Blue Nile to irrigate extensive sectors of its highlands. Egypt promptly declared that if this occurred, it would immediately declare war.

### The water sector

Water has long served as a key illustration of ES. The first recorded instance was 4500 years ago when two Mesopotamian city states went to war in what is now southern Iraq. But the phenomenon of ES in the full sense of the term is much more recent, arising only in the last few decades, and primarily as a result of wholly unprecedented growth in human numbers and human activities. Since 1950 the global freshwater supply per person has fallen by 60% as world population has swelled by over 150% and the world's water consumption has increased by 180%; consumption can be expected to increase by a further 40% within the next two decades. Thus today's world is radically changed from all former worlds, and it is "new and different" to an extent we can barely apprehend, let alone comprehend. During the past half century there have been more than 450 water-related disputes of hostile sorts, and on 37 occasions rival countries have fired shots, blown up a dam, or undertaken some other form of violent action.

At least 261 of the world's major rivers are shared, with 176 flowing through two countries, 48 through three countries, and 37 through four or more countries. Their river basins account for more than 45% of the Earth's land surface, they account for 60% of the world's freshwater supply, and they supply nearly 40% of the world's population with water for domestic use, agriculture, hydropower and other salient purposes. As many as 80 countries with nearly three billion people or two-fifths of the world's population already suffer serious water deficits. Two-thirds of water withdrawals are used to produce that basic commodity, food. In Southern Asia, water shortages rather than land shortages look likely to curtail plans to expand agriculture. In Asia as a whole with 60% of the world's people, there is only 36% of the world's renewable freshwater.

Already there are hefty pushings and shovings between Turkey on the one hand and Syria and Iraq on the other hand over the Rivers Tigris and Euphrates; between India and Pakistan over the Indus; between India, Bangladesh and Nepal over the Ganges; between Brazil and Argentina over the Rio de la Plata; and between nations sharing the Mekong's river basin. Water wars, anyone?

#### Other environment/security linkages

What has emerged because of water deficits applies also to deforestation, soil erosion, desertification, decline of marine fisheries, and a host of other environmental problems with widespread impact. Desertification, for instance, can generate broadscale problems for human welfare and political stability. By virtue of its capacity to trigger famines, internal displacements and international migration, desertification often serves as a recipe for political instability (Algeria, Chad), for tensions between neighbouring countries (e.g. Zimbabwe, Botswana), and even for armed conflict. It is surely not coincidental that in the Sahel zone of Africa, not a single government survived the droughts of the 1970s and 1980s, several fell twice over, and a few are moving toward still further collapse. Desertification and drought threaten the livelihoods of one billion people in more than 110 countries, and another one billion are at risk. Yet according to the Convention to Combat Desertification, also the United Nations Environment Programme, a 20-year global effort would cost no more than \$22 billion per year, with savings for agriculture alone worth \$42 billion per year.

The desertification case points up a basic qualifier: we must be careful not to overstate the case. Not all environmental problems lead to conflict, and not all conflicts stem from environmental problems. Far from it. Indeed it is rare for linkages to be directly and exclusively causative. But there is enough evidence for the central thesis to stand. Similarly, while environmental phenomena contribute to conflicts, they can rarely be described as sole causes. There are too many other variables mixed in, such as inefficient economies, unjust social systems and repressive governments, any of which can predispose a nation to instability--and thus, in turn, make it specially susceptible to environmental problems. In developing countries, absolute poverty water, shelter and health--afflicts 1.3 billion people, or one in five of humankind. Impoverished people become desperate people, all too ready to challenge governments through e.g. support of guerilla groups as in the Philippines and Peru. At the same time, impoverished people feel driven

by their plight to overwork their croplands, to clear forests and to cultivate drylands and mountain slopes for additional croplands, all of which trigger soil erosion and other environmental ills, and result in poverty compounded.

To reiterate a central point: there is often a number of further factors that undermine security. They include faulty economic policies, inflexible political structures, oligarchical regimes, oppressive governments and other adverse factors that have nothing directly to do with environment. But these deficiencies often aggravate environmental problems, and are aggravated by environmental problems in turn.

In short, there is a growing linkage between environment and conflict. Environmental deficiencies supply conditions which render conflict all the more likely. They can serve to determine the source of conflict, they can act as multipliers that aggravate core causes of conflict, and they can help to shape the nature of conflict. Moreover they can not only contribute to conflict, they can stimulate the growing use of force to repress disaffection among those who suffer the consequences of environmental decline.

All this means that national security is no longer about fighting forces and weaponry alone. It relates increasingly to watersheds, forests, soil cover, croplands, genetic resources, climate and other factors rarely considered by military experts and political leaders, but that taken together deserve to be viewed as equally crucial to a nation's security as military prowess. The situation is epitomized by the leader who proclaims he will not permit one square metre of national territory to be ceded to a foreign invader, while allowing hundreds of square kilometres of topsoil to be eroded away each year.

The meta-problem of ES began to be recognized in the mid-1980s when the Brundtland Commission included a chapter on the issue in its final report: "The environmental problems of the poor will affect the rich as well in the not too distant future, transmitted through political instability and turmoil." And as Mikhail Gorbachev put it in 1989, "The threat from the skies today not so much nuclear missiles as ozone-layer depletion and global warming." Since the 1980s the issue has steadily grown in importance, and the 1990s, especially the second half, have witnessed an outburst

of fresh studies and appraisals (see References and Bibliography, mostly from the last half dozen years). To this extent, the issue is becoming, shall we say, newer than it has ever been.

In summary review: the ES issue can be defined as the relationship to established security of those environmental factors--water, soil, vegetation, climate, and whatever others are prime components of a nation's environmental foundations--that ultimately underpin all our socioeconomic activities and hence our political stability. Conversely, when these environmental resources are degraded or otherwise depleted, so our security declines too. Thus the definition reflects security in its proper broad sense: security for all, security for ever. However hard it may be to demonstrate the thesis with empirical evidence, it is much harder to demonstrate that the opposite is the case.

#### Lack of predictive capacity

There is a sizeable difference, moreover, between current analyses and those of the past. The principal point of discourse today lies with the continuing lack of predictive capacity for the issue. It is in this respect that the past few years have seen an emergent new "slant" as a growing number of analysts have raised a central critique.

In essence: we still have no over-arching sense of which environmental problems will lead to which sorts of conflict in which lands at which stage of the future. If we knew more along those lines, we could do more to anticipate conflicts and wage pre-emptive strikes (environmental protection measures) against them. Of course the best way to cut off environmental problems at the pass is to tackle them at source. We need much greater effort to push back the deserts, to replant the forests, to get more work out of every unit of energy, to recycle on every side, to stabilize climate, etc. These are all things we should be doing for all kinds of other good reasons, even if there were no security aspect. To this formidable extent, we face a win-win situation.

#### Collective security

There is a further crucial lesson to be learned from the new view of environment-based security. While we need to expand our understanding of security to incorporate an environmental dimension, we also need to adapt our policy purview by doing more to highlight collective security. The challenge is well illustrated by the question of climate change. This is a problem to which all

nations contribute; by which all will be affected; from which no nation can remotely hope to insulate itself; and against which no nation can deploy worthwhile measures on its own.

What can governments do to meet the new challenges? Primarily they can recognise that many forms of environmental impoverishment constitute a distinctive category of international problems, unlike any of the past. They lie beyond the scope of established diplomacy and international relations. While impinging on the strategic interests of individual nations, they prove altogether immune to the standard response to major threats, namely, military force. We cannot launch fighter planes to resist global warming, we cannot despatch tanks to counter advancing deserts, we cannot fire the smartest missiles against rising sea levels.

These problems require a response different in yet another sense. This response must emphasize cooperation rather than confrontation within the international arena. No nation can meet the challenges of global change on its own. Nor can any nation protect itself from the actions--or inaction--of others. Plainly this demands a seismic shift in spirit and strategy alike. It postulates as big a change for the nation-state as any since the emergence of the nation-state 400 years ago. To cite Sir Crispin Tickell, former British Ambassador to the United Nations, "No man is an island, no island is an island, no continent is an island. Yet nation-states still think principally if not almost entirely in terms of islands--economic, political, environmental islands." To cite too the opening sentence of the Brundtland Commission's report, "Our Earth is one, our world is not."

#### The Mediterranean experience

As an example of the newly needed collaboration, note an eminent success story. Until the mid-1970s the Mediterranean Sea had long been used as a cesspool by the 100 million people who lived along its shorelines and by the still larger throngs of people who took their vacations there each year, making up one third of all tourists worldwide. As an enclosed sea with an outlet confined to the narrow Straits of Gibraltar, the Mediterranean renews its waters only once every eighty years. Tides are small and currents weak, leaving pollution pretty much where people dump it. In fact, few areas of the world are subject to as much human disruption as the Mediterranean. It is one of the world's main waterways for shipping, with one third of total petroleum trade, while the great bulk of pollutants stem from land sources in the form of industrial waste, municipal sewage and agricultural residues.

In 1975 the United Nations Environment Programme started on what seemed an absurdly ambitious project. It wanted to persuade all the coastal nations to formulate a joint strategy to tackle their joint problem. Eventually the seventeen nations except for Albania sat down to formulate a plan of action. UNEP's feat was all the more remarkable in light of some of the parties making common cause with each other: Israel and Syria, who were in a state of perpetual hostility; Egypt and Libya: long-standing foes; Turkey and Greece, with hundreds of years of enmity; France and its former colony Algeria, still mistrustful of each other; and Spain and Morocco, wary of ancient antagonisms. A 1980 conference came up with a draft treaty, which came into operation in 1982. As a result, pollution has been much reduced, and while the Mediterranean is not yet healed by a long way, it is no longer dying.

There could hardly have been a region in the world with greater political disparities among nations in question, yet they were persuaded to rise above their individual interests in favour of the collective welfare. The Mediterranean blueprint now serves as a model for parallel programmes in other regional seas, notably the Baltic, the Persian Gulf and the Caribbean.

#### International linkages

By contrast with the Mediterranean experience, certain of the environmental problems cited, notably water shortages, agricultural decline and deforestation, are located almost entirely in developing nations. Why then, one might ask, should security analysts in developed nations be concerned with water disputes in the Indian sub-continent, food shortages in Africa and deforestation in Amazonia? There are several reasons. One arises with respect to political stability in developing countries. To cite a 1988 report of the Ikle and Wohlstetter Commission on Integrated Long-Term Strategy, "Violence in the Third World threatens our interests in a variety of ways. It can imperil a fledgling democracy (as in El Salvador), increase pressures for large-scale migration to the United States (as in Central America), jeopardize important U.S. bases (as in the Philippines), and threaten vital sea lanes (as in the Persian Gulf)." Again, these security linkages between the United States and developing nations apply to other developed nations, albeit with differences in accord with particular strategic relationships.

A second linkage between the developed world and the developing world lies with the fact that environmental problems in one country often spill way beyond its borders. As Amazonia is subjected to widespread burning, roughly one fifth of the world's chief greenhouse gas, carbon dioxide, comes from burning of tropical forests. To this extent, everyone in the developed world has an emphatic interest, whether they are aware of it or not, in what goes on in developing countries way beyond the horizon. Climatic patterns embrace the whole world--and the winds carry no passports.

### Financial tradeoffs

We have already noted the financial tradeoffs implicit in the United States between one extra fighter plane and various environmental safeguards. The generic question of tradeoffs needs to be addressed in detail with lots of illustrative examples. Suffice it here to note that just 10% of military spending worldwide, now running at over \$2 billion per day, would be enough to finance the Anti-Desertification Plan, to supply clean water and sanitation worldwide, and to upgrade agriculture throughout the developing world. Major military spenders today are the United States with \$405 billion per year, Japan \$47 billion, U.K. \$36 billion, France \$34 billion, and China \$31 billion. Note also sales of arms and other weaponry, \$16 billion per year, of which the United States accounts for \$7 billion, Russia almost \$6 billion, and U.K. \$4.5 billion.

Needed urgently: an across-the-board review of tradeoffs implicit. Data could be obtained from Worldwatch, SIPRI and UNDP.

### Conclusion

The field of environmental security gained little attention following its emergence in the mid-1970s. It prompted only a few substantive assessments until the mid-1990s, whereafter a sizeable number of analysts have broached it. Today the field has advanced so far that the overall rationale has been frequently cited among security appraisals by nations such as the United States, the United Kingdom, Norway, India and Australia, also by NATO. Regrettably it has not yet become officially and formally adopted within long-term thinking by any of the nations listed, still less has it become embedded within overall strategic planning. It has a long way to go before it earns the prominence it deserves. All the more welcome, then, is the May 2004 conference.



## ENVIRONMENTAL SECURITY: REFERENCES AND BIBLIOGRAPHY

- Allenby, B. 1998. Environmental Security as a Case Study in Industrial Ecology. *Journal of Industrial Ecology* 2: 45-60.
- Allenby, B. R., T. J. Gilmartin and R. F. Lehman II, editors. 1999. *Environmental Threats and National Security*. Lawrence Livermore National Laboratory, Livermore, California, USA.
- Alvarez, M.D. 2001. Could Peace be Worse than War for Colombia's Forests? *The Environmentalist* 21: 305-315.
- Arun, E. 1999. *Hydropolitics in the Third World: Conflict and Cooperation in International River Basins*. US Institute of Peace Press, Washington DC., USA.
- Ascher, W. and N. Mirovitskaya, 2000. *The Caspian Sea: A Quest for Environmental Security*. Kluwer, Dordrecht, Netherlands.
- Baechler, G. 1998. Why Environmental Transformation Causes Violence: A Synthesis. *Environmental Change and Security Project Report 4*: 24-44. Woodrow Wilson Center, Washington DC, USA.
- Barnett, J. 2001. *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era*. Zed Books, London, UK.
- Benedick, R.E. 2000. Human Population and Environmental Stresses in the Twenty First Century. *Environmental Change and Security Project 6*: 5-18. Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.
- Brennan, E.M. 1999. Population, Urbanization, Environment, and Security: A Summary of the Issues. *Environmental Change and Security Project 5*: 4-14, Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.
- Carius, A. and K.M. Lietzmann, editors. 1999. *Environmental Change and Security: A European Perspective*. Springer Verlag, Berlin, Germany.
- Christopher, W. 1996. *American Diplomacy and the Global Environmental Challenges of the 21st Century*. Department of State, Washington DC, USA.
- Conca, K. and G. D. Dabelko, editors. 1998. *Green Planet Blues: Environmental Politics from Stockholm to Kyoto*. Westview Press, Boulder, Colorado.
- Dabelko, G.D., ed. 2001. *Environmental Change and Security Project Report, Issue no. 7*. The Woodrow Wilson Center for Scholars, Washington DC, USA.

Dalbelko, G. S. Lonergan and R. Matthew. 2001. State of the Art Review on Environment, Security and Development Cooperation. Organisation for Economic Co-operation and Development, Paris, France.

de Soysa, I. and N. P. Gleditsch. 1999. To Cultivate Peace: Agriculture in a World of Conflict. Environmental Change and Security Project 5: 15-15, Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.

Deudney, D.H. and R. A. Matthew, editors. 1999. Contested Grounds: Security and Conflict in the New Environmental Politics. State University of New York Press, Binghamton, NY, USA.

Diehl, P. and N. Gleditsch, editors. 2001. Environment and Conflict. Westview Press, Boulder, Colorado, USA.

Dobkoski, M. N., and I. Wallimann, editors. 1998. The Coming Age of Scarcity. Syracuse University Press, Syracuse, New York, USA.

Douglas, B.C. Michael S. Kearney and Stephen P. Letherman, editors. 2001. Sea Level Rise: History and Consequences. Academic Press, New York. USA.

Engelman, R. 1997. Human Population Prospects: Implications for Environmental Security. Environmental Change and Security Project Report Issue 3: 47-54. Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.

Esty, D. C. 1999. Pivotal States and the Environment. In R. Chase, E. Hill and P. Kennedy, editors, The Pivotal States: A New Framework for U.S. Policy in the Developing World: 290-314. Norton, New York, USA.

Fleishman, R. 1995. Environmental Security: Concept and Practice. National Security Studies Quarterly: 11-16.

Gasana, J. 2002. Natural Resource Scarcity and Violence in Rwanda. IUCN, Gland, Switzerland; also 2002, Remember Rwanda? World Watch Magazine 15(5): 24-33.

Gizewski, P., and T. Homer-Dixon. 1996. Environmental Scarcity and Violent Conflict: The Case of Pakistan. Peace and Conflict Studies Program, University of Toronto, Toronto, Canada.

Gleditsch, N.P., ed. 1997. Conflict and the Environment. Kluwer Publisher, Dordrecht, Netherlands.

Gleick, P.H. 2000. Environment and Security: Water Conflict Chronology. Pacific Institute for Studies in Development, Environment and Security, Oakland, California, U.S.A.

Gleick, P. 2002. The World's Water 2002-2003: 194-208. Island Press, Washington DC, USA.

Goldstone, J. A. 1999. Population and Pivotal States. In Chase et al, editors, The Pivotal States: 250-269. Norton, New York, USA.

- Gurtov, M. 2002. *Pacific Asia? Prospects for Security and Cooperation in East Asia*. Rowman and Littlefield Publishers Inc., Lanham, Massachusetts, USA.
- Haddadin, M. 2002. *Diplomacy on the Jordan*. Kluwer Academic, Dordrecht, Netherlands.
- Haque, M. S. 2002. *Non-Traditional Security and the Environment in Northeast Asia*. United Nations University, Tokyo, Japan.
- Hermann, C., H. K. Jacobson, and A. S. Moffat, editors. 1999. *Violent Conflict in the 21st Century: Causes, Instruments and Mitigation*. The Midwest Center of the American Academy of Arts and Sciences, Chicago, Illinois, USA.
- Hjort, Af. Ornas, A. and S. Lodgaard. 1992. *The Environment and International Security*. Environmental Policy and Society Programme, Uppsala University, Uppsala, Sweden.
- Homer-Dixon, T. 1996. *Project on Environment, Population, and Security: Key Findings*. Woodrow Wilson Center, Smithsonian Institution, Washington D.C., USA.
- Homer-Dixon, T. 1999. *Environmental Scarcity and Violence*. Princeton University Press, Princeton, New Jersey, USA.
- Homer-Dixon, T. and J. Blitt, editors. 1998. *Eco-Violence: Links Among Environment, Population, and Security*. Rowan and Littfield, Lanham, Massachusetts, USA.
- Hussein, A. and A. Wolfe, eds. 2000. *Water in the Middle East: A Geography of Peace*. University of Texas Press, Austin, Texas, USA.
- Kasperson, J.X. and R.E. Kasperson, eds. 2001. *Global Environmental Risk*. United Nations University Press, Tokyo, Japan.
- Klare, M.T. 2001. *Resource Wars: The New Landscape of Global Conflict*. Henry Holt, New York, USA
- Lietzmann, K.M. and G. D. Vest. 1999. *Environmental Security in an International Context*. Environmental Change and Security Project 5: 34- 48, Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.
- Lopez, A. 1999. *Environmental Change, Security, and Social Conflicts in the Brazilian Amazon*. Environmental Change and Security Project 5: 26-33, Woodrow Wilson Center for Scholars, Smithsonian Institution, Washington DC, USA.
- Lowi, M. R. 1995. *Rivers of Conflict, Rivers of Peace*. *Journal of International Affairs*, Summer 1995: 123-144.
- Matthew, R. 1998. *Environment and Security: Concepts and Definitions*. *National Security Studies Quarterly* 4: 63-72.

- Matthew, R., ed. 1999. *Contested Grounds: Security and Conflict in the New Environmental Politics*. SUNY Press, Albany, New York, USA.
- Matthew, R. 2000. The Environment as a National Security Issue. *Journal of Policy History* 12: 101-122.
- Matthew, R. (co-author), 2000. *Environment, Population, and Conflict: Suggesting a Few Steps Forward*. Environmental Change and Security Project Report 6.
- McNeely, J. 2000. War and Biodiversity: An Assessment of Impacts. Pp: 353–369 in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives*. J. Austin and C. Bruch, eds. Cambridge University Press, Cambridge, U.K.
- Messer, E., M. Cohen, and J. D’Costa. 2000. *Armed Conflict and Hunger*. <http://www.worldhunger.org/articles/fall2000/messer1.htm>.
- Messer, E. 2001. *Conflict and Hunger*. Environmental Change and Security Project Report, Issue no. 8. Woodrow Wilson Center for Scholars, Washington DC, USA.
- Myers, N. 1987. Population, Environment and Conflict. *Environmental Conservation* 14(1): 15-22.
- Myers, N. 1989 Environment and Security. *Foreign Policy* 74: 23-41.
- Myers, N. 1993. Population, Environment and Development. *Environmental Conservation* 20(3): 1-12.
- Myers, N. 1996. *Ultimate Security: The Environmental Basis of Political Stability*. Norton, New York, USA.
- Myers, N. 2001. Environmental Refugees: Our Latest Understanding. *Philosophical Transactions of the Royal Society B*: 356: 16.1-16.5.
- Myers, N. and J. Kent. 1995. *Environmental Exodus: An Emergent Crisis in the Global Arena*. The Climate Institute, Washington DC, USA.
- Myers, N. and J. Kent. 2001. Food and Hunger in Sub-Saharan Africa. *The Environmentalist* 21: 41-69.
- National Intelligence Council and the Central Intelligence Agency. 2001. *Global Trends 2015*. National Intelligence Council and Central Intelligence Agency, Washington D.C., USA.
- Nichiporuk, B. 2000. *The Security Dynamics of Demographic Factors*. RAND, Santa Monica, California, USA.
- Ohlsson, L. 2000. *Livelihood Conflict: Linking Poverty and Environment and Causes of Conflict*. Swedish International Development Agency, Stockholm, Sweden.

- Ostrom, E., J. Burger, C. B. Field, R. B. Norgaard and D. Policansky. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284: 278-282.
- Smith, D. and W. Ostreng, eds. 1997. *Environment, Poverty and Conflict: A Proposal*. International Peace research Institute, Oslo, Norway.
- Pirages, D. C. and T. M. DeGeest. 2003. *Ecological Security: An Evolutionary Perspective on Globalization*. Rowman and Littlefield, Lanham, Maryland, USA.
- Postel, S. 1997. *The Last Oasis*. Norton, New York, USA.
- Postel, S.L. and A.T. Wolfe. 2001. Dehydrating Conflict. *Foreign Policy* Sept/October 2001. 60-67.
- Preston, R. The Demon in the Freezer, *The New Yorker* July 4 1999: 44-61.
- RAND Corporation. 2000, *Demographics and the Changing National Security Environment*. RAND Corporation, Santa Monica, California, USA.
- Renner, M. 1996. *Fighting for Survival : Environmental Decline, Social Conflict, and the New Age of Insecurity*. Worldwatch Institute, Washington D.C., U.S.A.
- Renner, M. 2002. *The Anatomy of Resource Wars*. Worldwatch Institute, Washington D.C., USA.
- Suliman, M. editor. 1999. *Ecology, Politics and Violent Conflict*. Zed Books, London, U.K.
- Teitelbaum, M.S. 1999. International Migration as a Pivotal Issue, in Chase et al, editors, *The Pivotal States: 270-289*. Norton,, New York, USA.
- United Nations. 1997. *Report of the Secretary-General on a Comprehensive Assessment of the Freshwater Resources of the World*. United Nations, New York, USA.
- United Nations Secretariat of the Convention to Combat Desertification. 2002. ([www.unccd.int](http://www.unccd.int))
- U.S. Department of Defence. 1995. *Report of the Defence Science Board Task Force on Environmental Security*. Government Printing Office, Washington DC, USA.
- U.S. Department of Defence. 1996. *Memorandum of Understanding Concerning Cooperation in Environmental Security*. Government Printing Office, Washington D.C., USA.
- U.S. Environmental Protection Agency. 1999. *Environmental Security: Strengthening National Security through Environmental Protection*. U.S. Environmental Protection Agency, Washington DC, USA.
- U.S. Environmental Protection Agency, Department of Energy, and Department of Defence. 1996. *Cooperation in Environmental Security*. Government Printing Office, Washington DC, USA.

Wolfe, A.T. 1998. Conflict and Cooperation Along International Waterways. *Water Policy* 1(2): 251-265.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford University Press, New York, USA.

And, what's more, the radical changes to daily life that we're seeing now are not "thankfully" going to be permanent. History tells us that when emissions have fallen sharply in the past, as they do after recessions, there's often a rocketing rebound that wipes out any short-term cut in emissions. (Read more about Covid-19's lasting impact on the environment.) Is this pandemic any different? Future Planet talks to BBC Minute about the close ties between lockdown and carbon emissions. In a nutshell: we could see long-lasting positive environmental change after the pandemic. But it's all down to how we move on after lockdown. You can watch the video above.