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ENVIRONMENTAL SECURITY:

EVOLUTION OF A NEW CONCEPT IN SECURITY STUDIES

by

John T. Ackerman, Major, USAF

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Advisor: Director of Security Studies Department, Lt Col Jim Forsyth

Maxwell Air Force Base, Alabama

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Contents

Preface

> *Environmental threats do not heed national borders and can pose long-term dangers to our security and well-being. Natural resource scarcities often trigger and exacerbate conflict. Environmental threats such as climate change, ozone depletion, and transnational movement of hazardous chemicals and waste directly threaten the health of U.S. citizens,*[1]

Struggles for natural resources are one of the oldest causes of conflict. The barbarians who destroyed the Roman Empire outgrew their northern forests and found greener pastures in Italy. The Japanese excursion into imperialism in World War II was precipitated by a need for oil, iron ore, and rubber, and the near extinction of American Indians revolved around gold and scarce farming land. These are but a few examples of resource driven conflict, but only recently has the topic of "environmental threats" received serious attention. In the field of security studies most of the research on environmental scarcity and violent conflict began in the early 1960s and continues today. Thomas Homer-Dixon, one of the leading researchers into human-induced environmental pressures, defines environmental scarcity as depletion or degradation of renewable resources.[2] Research on the connection between environmental scarcity, violent conflict, and the concept of environmental security began in the late 1970's. Environmental security and its direct impact on national and international security has not gone unnoticed by our nation's leaders. Former Secretary of Defense William Perry identified two environmental security challenges for the U.S. in a speech on "preventive defense."[3] One challenge is to "understand where and under what circumstances environmental

degradation and scarcity may contribute to instability and conflict and to address those conditions early enough to make a difference. The second challenge is to determine where military environmental cooperation can contribute significantly to building democracy, trust, and understanding."[4]

The focus of this paper is on the first challenge. Our goal here is to add to our knowledge of the relationship between environmental scarcity, violent conflict, and environmental security. Quite possibly, this will add to our understanding of the "where and under what circumstances" environmental degradation, scarcity, and conflict occur and how they will impact U.S. environmental security. My general belief is a deeper understanding of environmental scarcity will aid us in "shaping the international environment to prevent or deter threats,....responding across the full spectrum of potential crises,....and preparing today to meet the challenges of tomorrow's uncertain future."[5]

I received substantial assistance from my research advisor Lt Col Forsyth. He gave me the freedom to search for a topic I was very passionate about and the experienced guidance on how to take the information I gathered and turn it into what I hope is useful knowledge. Helping prepare our military for an unclear future is my goal, and I hope I have made a contribution

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Abstract

The objective of this paper is to determine how environmental degradation impacts U.S. National Security by researching the evolution of the concept of environmental security. Research was pursued via Internet and AU Library sources. Significant articles, papers, and books on population impacts, environmental degradation, violent conflict, and environmental security were reviewed and analyzed from 1960 till 1998. In the first chapter, I analyzed the research material investigating the causes and effects of environmental degradation in the 1960s and 1970s, focusing on the impact of population growth. This early material debated the potential, deadly environmental effects, swift decline in living conditions, and violent conflict for scarce renewable and nonrenewable resources that the impending "population bomb"[6] would cause. Chapter Two looks at the growing debate during the 1970s and 1980s on the effects of environmental degradation on ecosystems, and the possible ramifications on international security. The first appearance of the concept of environmental security was seen during this phase. The third chapter deals with the connection between degradation of renewable resources, violent conflict, and environmental security. Finally, the last chapter introduces my conclusions, and gives suggestions for intervention by the U.S., our allies, and the United Nations into environmental security threats in the 21st century.

Notes

[1] Clinton, William J., 1998. *A National Security Strategy for a New Century*, page 13. The White House, October 1998.

[2] Homer-Dixon, Thomas F., 1994. "Environmental Scarcities and Violent Conflict: Evidence from Case Studies," page 5. *International Security*, 19(1): 5-40.

[3] Wasserman, Sheri G., 1996. "The Environment and National Security," page 2. National Defense University.

[4] Ibid., page 1.

[5] Clinton, William J., 1998. *A National Security Strategy for a New Century*, page 6. The White House, October 1998.

[6] Ehrlich, Paul R., 1968. *The Population Bomb*, page 1. New York.

Chapter 1

Environmental Impact of Population

Population when unchecked increases in a geometric ratio. Subsistence increases only in an arithmetic ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison with the second.

—Thomas Malthus[1]

This chapter analyzes the various facts, theories, and hypotheses of selected research from 1960-1979 focussing on the impact of human population on the environment. The information presented ranges from human impacts on the natural world and the beginnings of the environmental movement. Also presented are apocalyptic predictions of the end of mankind from human over population and some contrary optimistic assessments of the effects of human population growth.

Dawn of the Environmental Movement

Rachel Carson's epic novel *Silent Spring*, published in 1962, was a wake-up call for humanity. Carson's detailed and undeniable research on the effects of DDT and other man-made pesticides eloquently exposed a new danger. Man now had the ability to destroy whole populations of animals and insects, and with them entire ecosystems. *Silent Spring* vividly described the long-term and deadly effect pesticides, fungicides, and rodenticides had on birds, insects, mammals, and humans. For example, bird mortality in areas sprayed with DDT to counter the spread of Dutch Elm disease resulted in some

gruesome statistics. "Careful comparative studies of sprayed and unsprayed areas, reported robin mortality to be 86% to 88%"[2] and "populations of nesting birds in general have declined as much as 90% in some of the sprayed towns."[3] In an attempt to stop an outbreak of black-headed budworm in British Colombian forests, DDT was sprayed and "in one of the rivers, the young of a run of 40,000 adult Coho salmon were almost completely annihilated."[4] Humans suffered no less. Farmers, migrant workers, spraymen, pilots, children and others exposed to appreciable quantities of pesticides died sudden and tragic deaths.[5] The bottom line of Rachel Carson's illuminating research was the profound interconnectivity of human beings and the natural environment. She concludes, "through all these new, imaginative, and creative approaches to the problem of sharing our earth with other creatures, there runs a constant theme, the awareness that we are dealing with life—with living populations and all their pressures and counter-pressures, their surges and recessions."[6]

Population Growth and Violent Conflict

In 1968, Paul and Anne Ehrlich reopened the Malthusian inspired debates on the effects of rapid human population growth. Their epic book, *The Population Bomb*, painted a picture of three of the four apocalyptic horsemen—war, pestilence, and famine, operating as "the agencies most likely to result in the drastic rise in the death rate in the next few decades."[7] They predicted that, as a result of this trio of killers, over 500 million people world-wide would die."[8] *The Population Bomb* was followed in 1973 by *Human Ecology: Problems and Solutions*, which predicted more dire situations. "Considering present technology and patterns of human behavior, our planet is grossly overpopulated,"[9] and they also predicted, "the limits of human capability to produce food

by conventional means have very nearly been reached,….as many as 10-20 million people are starving to death annually,….attempts to increase food production further will tend to accelerate the deterioration of our environment, which in turn may eventually reduce the capacity of the Earth to produce food."[10] Finally, they conclude that rapid population growth definitely increases the probability of a lethal worldwide plague and a thermonuclear war.[11] Two horrors that could end civilization as we know it.

The Ehrlich's saw a clear connection between increasing population, decreasing food supplies, a global environmental crisis, and increasing international violent conflict. They believed that unrestrained population growth was going to lead to the end of civilization if drastic changes were not implemented. The Ehrlichs were not alone in their beliefs, but others had a different focus on the impact of population growth.

Nazli Choucri and Robert C. North's *Nations in Conflict: National Growth and International Violence*, presented a different approach to the impact of population growth. They discovered in their research "extensive interdependency among certain variables: growth, expansion, competition, conflict of national interests, and violence."[12] In particular they found that "domestic growth (as measured by population density and national income per capita) is generally a strong determinant of national expansion,… investigations have identified strong linkages from domestic growth and national expansion to military expenditures, to alliances, and to international interactions with a relatively high potential for violence."[13] Also, they stated "the interactive processes inherent in population growth, technological advancement, and rapidly increasing demands for resources have always had implications for conflict and violence."[14] Basically, they determined that population growth will lead to growth of the haves, the

rich, developed nations[15] at the expense of the have nots, the poor, undeveloped nations,[16] and violent conflict could easily erupt from ensuing competition for resources.

On a solo effort, Robert C. North also found some interesting relationships between population, resource scarcity, technology, and conflict. Mr. North's article "Toward a Framework for the Analysis of Scarcity and Conflict" presented some simplistic yet revealing models for studying the relationship between scarcity, population, technology, and conflict. His premise was "world distributions of population, technology, capital, and usable resources thus affect the characteristics and behaviors of individual countries in important ways."[17] He found that population pressure combined with low access to resources and no technology to save the day, yields a country looking to expand and usually by force. Alternatively, scarcity of resources with no technological advances to mitigate the scarcity will result in conflict, especially if over population pressure magnifies the problem.

The research presented up till now is generally very alarmist and pessimistic. Carson's work illustrated the need to understand the web of life and the intricate strands that connect predator and prey and the delicate balances necessary to maintain ecosystems. The Ehrlichs aggressively presented a scenario of uncontrolled population growth causing future wars, famine, and plagues. They believed the carrying capacity of the Earth would soon be reached and a violent collapse of civilization would follow. Choucri and North explained that population growth will lead to national expansion and wars of conquest for scarce natural resources. North's solo effort focused on the lack of advanced technology to alleviate the environmental degradation caused by over population in developing countries as the determining factor for conflict. All of these

papers strongly assert that over population will have negative environmental affects on many countries and eventually lead to conflict. As the debate surged on, a new level of sophistication to the research efforts was added by the "Club of Rome."

A virtual model of man's impact on the Earth was created by the "Club of Rome," a group of concerned scientists and politicians. Donella and Dennis Meadows, with assistance from MIT, created a computerized model of the world to investigate five major human pressures: accelerating industrialization, rapid population growth, widespread malnutrition, depletion of nonrenewable resources, and a deteriorating environment.[18] Their major conclusion was "if the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years,....the result will be a rather sudden and uncontrollable decline in both population and industrial capacity."[19] Here was another apocalyptic vision of the world's future showing the extremely strong beliefs of impending doom caused by population growth. Generally, this genre of research dominated the literature in the 1960s and 1970s. The literature was dominated by predictions of doom and gloom. Prospects of a nuclear or over population driven Armageddon influenced researchers and clearly created great pessimism for the future of man. The world as we knew it was going to end very shortly and the only way out was to stop population growth entirely and in some areas of the world that were over populated, create conditions for negative population growth.

E.B. Russell's paper "Population Pressure and War" explained where some of these doomed feelings came from. He states, "war caused by pressure of population are no novelty. History has recorded numerous times where population pressures were

relieved by migration, emigrations, or hostile expansion (i.e. war)."[20]   But Russell also points out some other new environmental problems caused by population growth. He identified the threats of technological advances in agriculture not keeping up with the effects of runaway population growth and that technological advance will not overcome the effects of erosion and the loss of soil nutrients from land overuse.[21] New threats of soil erosion, desertification, deforestation, air/water pollution, and fisheries depletion were just coming to light at the end of the 1970s and the beginning of the 1980s. I'll revisit these new environmental issues in the next chapter. However, the end of the world has not occurred and mankind has not succumbed to the three horsemen of the apocalypse; war, famine, and pestilence. Why not?

Counter Arguments to Population Growth and Violent Conflict

Many Malthusian followers predicted a gruesome end for mankind around the end of the 1970s. However, not all researchers believed in the power of over population to create war, famine or pestilence. They believed that other factors, including political; economic; social; and technological, had as great or greater effect on our environment and conflict. Howard M. Bahr, in his book *Population, Resources, and the Future: Neo-Malthusian Perspectives*, countered the Malthusian vision. He states, "population size is a relatively unimportant determinant of variation in the quality and length of human life when compared to the impact of technological development and the nature and efficiency of a society's social organization."[22] Bahr also asserts that the 'self-fulfilling prophesy' that Neo-Malthusians push forward was more of a threat than the actual problems caused by over population.[23]   Bahr directly attacks Ehrlich and other Neo-Malthusians by concluding that implicit in their theories are a 'forced choice' between prevention of

millions of new births or a justification for wide-spread violence and war.[24] He believes

that there are many more other 'choices' and they are much more complex than the Neo-

Malthusians lead people to believe.

Quincy Wright's, *A Study of War,* offered a different perspective on the causes of

war. He states, over population problems are never 'necessary' causes of war nor are

they 'rational' causes of war.[25] Wright further explains the role of population as a cause

for war in the following: "Increasing population differentials may tend to create tensions

and lead to war between neighbors who are traditional rivals,…population changes affect

war and migration only indirectly,…civilized men migrate or make wars because of their

thoughts,….not because of necessity."[26] Finally, he identifies the other factors involved,

"population pressures may or may not lead to international difficulties, depending upon a

multitude of geographic, cultural, technological, physiological, political, military,

psychological, and other factors in the particular situation."[27] Wright asserts that there

are many causes of war and that population is far from the most important or relevant.

On the other hand, he states, population increase may lead to closer cooperation among

people and to peaceful interdependence.[28]

Despite the counter arguments, population growth was still determined to be a huge

factor in the propensity of countries to engage in violent conflict, but initially only in

domestic conflicts. The pressures that over population cause on the political, social,

economic, technological, and cultural elements of a society are profound and very

difficult to deal effectively with. The research so far has only identified a few of the

domestic symptoms of the problem and the overall cause. The symptoms include soil

erosion, desertification, deforestation, air/water pollution, and fisheries depletion all

caused more or less by over population pressures. What emerged next is the concepts of global interconnectivity of these symptoms and global environmental threats. The next chapter will investigate these global threats along with population impacts, development of ecosystems as study entities (investigating the interconnectivity of the threats), and environmental security as an international security topic where global threats are becoming international security issues.

Notes

[1] Malthus, Thomas, 1798. *Essay on the Principle of Population*.

[2] Carson, Rachel, 1962. *Silent Spring*, page 109. Boston MA: Houghton Mifflin.

[3] Ibid., page 109.

[4] Ibid., page 138.

[5] Ibid., page 188.

[6] Ibid., page 296.

[7] Ehrlich, Paul R., 1968. *The Population Bomb*, page 61. New York.

[8] Ibid., page 62.

[9] Ehrlich, Paul R & Anne H. Ehrlich, 1973. *Human Ecology: Problems and Solutions*, page 277. San Francisco, CA: Freeman.

[10] Ibid., page 277.

[11] Ibid., page 278.

[12] Choucri, Nazli, and Robert C. North, 1974. *Nations in Conflict: National Growth and International Violence*, page 3. Lexington MA.

[13] Ibid., page 279.

[14] Ibid., page 286.

[15] Ibid., page 284.

[16] Ibid., page 284.

[17] North, Robert C. 1977. "Toward a Framework for the Analysis of Scarcity and Conflict," page 582. *International Studies Quarterly*, 21(4):569-592.

[18] Meadows, Donella; Dennis Meadows, Jorgen Randers & William Behrens, 1972. *The Limits of Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*, page 21. New York: Universe Books.

[19] Ibid., page 23.

[20] Russell, E.B., 1964. *Population and War*, page 1, in S Mudd, ed *The Population Crisis and the Use of World Resources,* Bloomington IND.

[21] Ibid., page 2.

[22] Bahr, Howard M., 1972. *Population, Resources, and the Future: Non-Malthusian Perspectives*, page 271. Provo UT.

[23] Ibid., page 271.

[24] Ibid., page 273.

Notes

[25] Wright, Quincy, 1965. *A Study of War, 2nd*, edn., page 280. Chicago IL: University of Chicago Press [First published in 1942].

[26] Ibid., page 283.

[27] Ibid., page 284.

[28] Ibid., page 278.

Chapter 2

Ecosystems and International Security

A threat to national security is an action or sequence of events that: 1) threatens drastically and over a relatively brief span of time to degrade the quality of life for inhabitants of a state, or 2) threatens significantly to narrow the range of policy choices available to the government of a state or to private non-government entities (persons, groups, corporations) within a state.

—Richard H. Ullman[1]

This chapter looks at selected environmental research from 1980 through 1989 that debated the relative impact of environmental problems on international security. The issues are the interconnectivity of population and resource scarcity, water wars and international security implications, and the importance of studying regional/ecosystem environmental impacts in relation to security. The result of the debates was the birth of a new international security concept, environmental security.

Population Growth, Resource Scarcity, and Violent Conflict

Arthur H. Westing describes in his book, *Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action*, his feelings on the interrelationship between humans and resources. He believes, "humans depend for their well-being and very survival on the resources they derive from the environment. Warfare—a prominent human activity—is one of the means by which access to these

resources is achieved."[2] The obvious dependence on resources by humans creates many pressures on the environment, most negative. Westing states that population growth in a country leads to overly intense agricultural, range, and tree-cutting practices that result in accelerated erosion and other forms of land degradation.[3] As Westing stated earlier, competition for scarce resources often results in conflict and war. He identified certain natural resources where competition has caused conflict and will likely do so again in the future. Westing pointed to past international disputes over fishing in exclusive economic zones which have escalated into armed conflicts. He cited as an example the Anglo-Icelandic Clash of 1972-1973 and also concluded that the Falkland-Malvinas Conflict of 1982 was in part over the control of offshore fishery resources.[4] Specifically, he believes the mineral fuels--coal, oil, natural gas, and uranium are of special concern: he points to the Chaco War of 1932-35, where Paraguay annexed a region of Bolivia, because they believed that it contained oil deposits.[5] Also, the Paracel Island Clash of 1974, where China routed Viet Nam to re-establish its claim on these islands in the South China Sea, was apparently over offshore oil deposits.[6] He sums up his ideas regarding the relationship between population growth and resources in the following statement: "In a world that already has too many people for all to be able to enjoy a standard of living approximating that of the developed nations, a heightened level of competition and dispute over natural resources can be expected in the years to come….some disputes could well become overtly hostile and thus lead to armed conflict."[7]

The assertion that resource scarcity will contribute to violent conflict and war is further supported by Robert Mandel's research in "Roots of the Modern Interstate Border Dispute." Mandel believes that competition for global resources will cause a larger

proportion of border disputes than will conflict over ethnic issues, and that the resource

competition will be for nonrenewable resources rather than renewable ones.[8] Along these

lines, Ted Gurr, in his article "On the Political Consequences of Scarcity and Economic

Decline," dives deeper into the political ramifications of the ecological constraints

imposed on economic growth by serious resource scarcity. He sees two outcomes for the

competition for resources in a world of expanding populations. The first is where

scarcity in rich societies leads to more conflict. The second, where a different kind of

politics is developed with new values, policies, institutions to overcome the problems

caused intense scarcity.[9] Gurr arrived at some other interesting conclusions concerning

the impacts of resource scarcity. One is that the economic impacts of scarcity will

depend on how quickly a resource becomes scarce and if no substitutes for it are found.[10]

He also asserts that the rapidity of economic decline will affect the ability of the political

system to respond.[11] He concluded that 'bureaucratic-authoritarian states' should be

better able than democracies to deal with scarcity induced crises.[12] However, other

researchers came to some different conclusions on the potential causes of future wars.

John K. Cooley's article on "The War Over Water" explains, "long after oil runs out,

water is likely to cause wars, cement peace, and make and break empires and

alliances….as it has for thousands of years."[13] Cooley believes that the 1967 Israeli/Arab

War was partly because the Arabs had unsuccessfully tried to divert into Arab rivers the

Jordan River headwaters that feed Israel.[14] Many other researchers also see water as a

prime source of conflict in the future. Nevertheless, not all researchers linked population

growth to competition for scarce resources and thus violent conflict or war.

Counter Argument to Population Growth, Resource Scarcity, and Violent Conflict

Julian L. Simon's article, "Lebensraum: Paradoxically, Population Growth May Eventually End War" arrived at some very optimistic conclusions compared to the pessimistic predictions seen above. He suggests that future shortages will hasten the discovery of ways to alleviate the shortages. The discoveries will lead to greater availability of substitute resources and none of these discoveries would happen without population pressures causing shortages.[15] His bottom line on the impact of population growth is over population will lead to shortages and increased economic burdens in the short run, but the economic problems will lead to increases in technology. How? 'Demand-side' pressures will increase payoffs for inventions and 'supply-side' pressures will increase the number of potential inventors from the larger population and the whole process will continue indefinitely.[16] He concludes that if nations will just calculate the economic benefit-cost ratio of war before hostilities, war would never happen.[17] Simon sees population growth as an opportunity for new technology to mitigate scarcities and therefore lessen the reasons for war. He believes that a large population only means more inventors, more discoveries, better technology, and more discoveries will mitigate over population problems. As the debates on the connection between population growth, resource scarcity, and violent conflict ebbed and flowed, new lines of debate emerged. Ecosystems and environmental security became hot topics during the 1980s.

Ecosystems and Environmental Degradation: A New Security Concept

In 1982, Johan Galtung wrote of a new approach to security in his book, *Environmental Development and Human Activity: Towards Alternative Security*

Doctrines. He contends that wars will further degrade the environment (emphasis on the effects of nuclear wars and population growth) and create an environment less able to sustain human societies and this will lead to even more wars as societies struggle for ever scarcer resources.[18] He identified some linkages between security and environment, "if a country (including the human part) is a stable ecosystem, then it is less vulnerable and hence more secure in withstanding attacks better and less likely to attack others,…as the security of others also contributes to one's own security, helping to build stable ecosystems in others, nationally and locally, e.g. through international cooperation, promotes general security."[19] He ties it together by saying, "if unstable ecosystems and deteriorating environments lead to war-like activity, it stands to reason that building stronger ecosystems, among other steps through control of population and depletion, would contribute to a decrease in war-like activity."[20] Galtung presents a viable argument that stable ecosystems, security, and environmental degradation are interconnected and that the greatest threats are from nuclear war and uncontrolled population growth.

Arthur Westing, in 1989, published, "The Environmental Component of Comprehensive Security." In it, he brings forth the concept of an "ecogeographical region"[21] which equates to a view of environmental ecosystems for analysis. For example, the Horn of Africa would be an ecosystem for analysis due to the interconnectivity and interdependency of the habitat and non-human/human populations. Using this specific approach he stresses that achieving environmental security for an ecosystem requires region-wide cooperation at all levels of government.[22] His main point is that "comprehensive security—extends far beyond military security, additionally

encompassing and combining--as it must—economic, social (including humanitarian), and environmental security."[23] Now we see the introduction of ecosystems as regions to be monitored for degradation, and the habitat and life forms living in them, studied to understand their interconnectivity. These studies determined that degradation of ecosystems create security risks to those nations that share the ecosystems. Finally, it was concluded that cooperation in sustainable ecosystem management amongst nations is implicit or conflict and further degradation will result.

Later in the 1980s, other researchers tried to pinpoint the exact types of environmental degradation that are threats to ecosystems and security. Johan J. Holst's article "Security and the Environment: A Preliminary Exploration" identified some of the threats. He states that population growth causes many farmers to till marginal soils and the whole process is exacerbated by inequitable land-holding systems, inadequate irrigation systems, conversion of agricultural land to non-agricultural uses, and to deforestation. Holst also stated, "soil erosion also leads to political erosion as the marginalization of peasants as producers frequently will result in their marginalization as a political force: in their becoming further removed from the process of authoritative decision making."[24] He further identifies another issue, desertification, where 35% of the Earth's surface and 20% of the world's population are threatened by this problem.[25] Holst cites the case of Haiti where, "almost 1 million Haitian 'boat people,' one-sixth of the entire population, have fled that island country because Haiti suffers some of the world's most severe erosion, making it impossible for farmers with reasonable amounts of land to make a living."[26] In addition to land degradation, he also sees water degradation as a source for conflict and hence insecurity. He explains that transnational

river basins may become battle zones as growing populations and industry fight over hydroelectric power and irrigation water. Farmers will need new water sources to rectify soil erosion caused by over-cultivation and further deforestation of river valleys by industry will damage water catchment areas causing rivers to flood and dry.[27]

Johannes B. Opschoor further investigates the issue of environmental security in his article "North-South Trade, Resource Degradation, and Economic Security." He examines various trade patterns in developing countries and finds, "a variety of factors, including environmental ones, force developing countries to engage in world trade relationships that in the long run may increase insecurity by widening the gap of resource endowments."[28] He defines environmental security as: "(1) a situation of sustainable resource utilization, (2) pollution within safe limits, and (3) adequate environmental crisis management."[29] Opschoor sees a major insecurity for developing countries as they sell out tomorrows resource base or natural capital to meet short-term financial requirements, thus putting an unpayable mortgage on tomorrow's security.[30] He uses examples from developing countries to make his point. For instance tapioca production in Thailand brings in 12% of total export income,[31] but also causes substantial deforestation, high rates of erosion, and huge drops in soil fertility. Once the land loses its nutrients because of tapioca cultivation, it becomes useless for between 5 and 20 years.[32] Another example of 'selling out tomorrow's resource base' is the soy crop in Brazil. Even though soy provided Brazil with some $2.5 billion in 1983[33] of income, it is grown on deforested land that was once irreplaceable savannas and forests.[34] Opschoor concludes that developing countries will need substantial assistance from the developed countries to overcome these poor patterns of resource utilization. This will include "sharing

environment and resource-saving technology, developing diversified and sustainable patterns of production and consumption, and diversifying trade flows to increase economic security."[35] The national environmental tragedies seen in Haiti, Brazil, and Thailand are not isolated cases. World-wide, many of the detrimental effects of population growth on fragile environments were being identified in the 1980's. More and more threats to national security caused by environmental degradation and scarcities were being investigated and identified. The debate on the issue of environmental security was growing and a broader definition soon evolved.

In 1988, Jessica T. Mathews, in her article "Redefining Security," wrote on the need for "a broadening definition of national security to include resource, environmental, and demographic issues."[36] Her major premise is, "for the first time in its history, mankind is rapidly—if inadvertently—altering the basic physiology of the planet. Global changes currently taking place in the chemical composition of the atmosphere, in the genetic diversity of species inhabiting the planet, and in the cycling of vital chemicals through the oceans, atmosphere, biosphere, and geosphere, are unprecedented in both their pace and scale,…unchecked, the consequences will be profound and irreversible."[37] Furthermore, she states plainly that population growth lies at the core of most negative environmental problems.[38] Specifically, she states "our accepted definition of the limits of national sovereignty as coinciding with national borders is obsolete. The government of Bangladesh, no matter how hard it tries, cannot prevent tragic floods….preventing them requires active cooperation from Nepal and India."[39] She believes that "the majority of environmental problems demand regional solutions which encroach upon

what we now think of as the prerogatives of national governments,"[40] hence a new definition of national and international security encompassing environmental threats.

We have seen the debate on environmental threats flow from negative impacts of over population, to global resource scarcity and violent conflict caused by population pressures, to identification of individual environmental problems, like soil erosion and desertification, and their effects on ecosystems and security. Ullman's definition of security seen in the Chapter 2 epigraph clearly identifies these problems as threats to national security. Soil erosion, desertification, or deforestation will "drastically and over a relatively brief period of time, degrade quality of life for inhabitants of a state" and competition for or conflict over scarce natural resources like fish, oil, or water will "narrow the range of policy choices available to the government of a state or to private non-government entities (persons, groups, corporations) within a state." The new threats that were identified fit neatly into the definition that Ullman proposes for threats to national security. The next chapter will delve into the sharpening debate on environmental scarcity causing violent conflict and how this impacts security.

Notes

[1] Ullman, Richard H., 1983. "Redefining Security," page 133. *International Security*, 8(Summer): 129-153.
[2] Westing, Arthur, H., ed., 1989. *Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action*, page 3. Oxford: Oxford University Press.
[3] Ibid., page 8.
[4] Ibid., page 16.
[5] Ibid., page 12.
[6] Ibid., page 12.
[7] Ibid., page 17.
[8] Mandel, Robert, 1980. "Roots of the Modern Interstate Border Dispute," page 452. *Journal of Conflict Resolution*, 24(3): 427-454.
[9] Gurr, Ted R., 1985. "On the Political Consequences of Scarcity and Economic Decline," page 54. *International Studies Quarterly*, 29(1): 51-75.

Notes

[10] Ibid., page 55.

[11] Ibid., page 65.

[12] Ibid., page 70.

[13] Cooley, John K., 1984. "The War Over Water," page 3. *Foreign Policy*, Spring, 1984.

[14] Ibid., page 3.

[15] Simon, Julian, 1989. "Lebensraum: Paradoxically, Population Growth May End Wars," page 165. *Journal of Conflict Resolution*, 33(1): 164-180.

[16] Ibid., page 177.

[17] Ibid., page 179.

[18] Galtung, Johan, 1982. *Environment, Development, and Human Activity: Towards Alternative Security Doctrines*, page 7. Oslo: Norwegian Press.

[19] Ibid., page 100.

[20] Ibid., page 100.

[21] Westing, Arthur H., "The Environmental Component of Comprehensive Security," page 131. *Bulletin of Peace Proposals*, 20(2): 129-134.

[22] Ibid., page 131.

[23] Ibid., page 133.

[24] Holst, Johan J., 1989. "Security and the Environment: A Preliminary Exploration," page 125. *Bulletin of Peace Proposals*, 20(2): 123-128.

[25] Ibid., page 125.

[26] Ibid., page 126.

[27] Ibid., page 128.

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Chapter 3

Renewable Resources, Ingenuity, and Violent Conflict

We must manage the earth's natural resources in ways that protect the potential for growth and opportunity for present and future generations…Global environmental concerns respect no international boundaries. The stress from these environmental challenges is already contributing to political conflict.

—1991 National Security Strategy

In 1991 the U.S. government acknowledged the importance of environmental issues as a subset of our national security interests. This chapter goes in depth into the environmental security issues of the 1990s. First, a discussion of the water issues that continue to challenge today's leaders. Next, an investigation into the most recent information on population, resource scarcity, environmental degradation, and their relationships to violent conflict, is presented. Last, supporting data from selected case studies on environmental problems will be analyzed.

Water and Violent Conflict

Water is still the lifeblood of nations, especially in the Middle East and North Africa. In Joyce R. Starr's 1991 article, "Water Wars," she identifies the enormous importance of water in this arid region. She states, "water security will soon rank with military security in the war rooms of defense ministries."[1] Starr highly recommends aggressive

international cooperation in developing a water dialogue or any possibility of peace in the Middle East is doomed.[2]

Mary E. Morris, in her paper, "Dividing the Waters: Reaching Equitable Water Solutions in the Middle East," further states that "the availability and control of water is also tied inextricably to environmental and demographic issues."[3] More importantly, time is of the essence, as explained in Pritt J. Vesilind's article "The Middle East's Critical Resource: Water." He states, "nations like Israel and Jordan are swiftly sliding into that zone where they are using all the water resources available to them. They have only 15 to 20 years left before their agriculture, and ultimately their food security is threatened."[4] If history is any judge, then Israel will not hesitate to maintain its water security through violence and aggression and therefore, water scarcity will be a cause of violent conflict in the future among other countries. While water is critical to some countries, population pressures, scarce resources, and preserving the natural environment are critical to all.

Population, Resources, Environmental Degradation, and Violent Conflict

Ronnie D. Lipschutz's and John P. Holdren's article, "Crossing Borders: Resource Flows, the Global Environment, and International Security," discusses the dependency of nations on resources and the potential security implications of trying to manage resources. They contend that the greatest threat to international security comes from the continuous degradation of the world's environment because of the enormous effects degradation has on the well-being and stability of many Third World countries.[5] On the dilemma of scarce resources, they feel the real issue is the distribution of resources and

how people perceive their relative position or standing in the distribution.[6] Also, they explain the greatest threats to international security won't come from the economics or politics of supply but from the environmental 'side-effects' of climate change caused by carbon dioxide released during the burning of fossil fuels, or the spread of nuclear bomb material by nuclear energy technology.[7] Lipschutz and Holdren introduce two new environmental security issues, climate change/global warming and the spread of weapons of mass destruction. Climate change will be discussed more in depth later, but weapons of mass destruction are not discussed in this paper.

Jaroslav Tir and Paul F. Diehl's article, "Demographic Pressure and Interstate Conflict: Linking Population Growth and Density to Militarized Disputes and Wars, 1930-89," determined a direct relationship between population pressure and international conflict. One of their basic conclusions was that population growth pressure increases the likelihood of a state becoming involved in a military conflict.[8] Specifically, they ascertained, "significant military capability may be necessary for population pressures to lead to conflict….low technology countries are more subject to population pressures and conflict involvement that their more advanced peers….the Third World will likely be the focus of population-driven conflicts….advanced technology may mitigate some of the deleterious effects of high population growth."[9] Tir and Diehl's report strongly supports the belief that population growth/pressure can contribute to violent conflict while Lipschutz and Holdren presented evidence that resource scarcity caused by unequal distribution causes violent conflict, and they determined the greatest threats come from the pressures of climate change. Both reports support the connections between over population causing environmental degradation and then violent conflict.

Acute Conflict: Evidence from Case Studies

Working within the emerging debates, Thomas Homer-Dixon is the leading researcher on environmental scarcity and violent conflict. His 1991 article, "On the Threshold: Environmental Changes as Causes of Acute Conflict," explores several interesting issues. He explained why the topic of environmental damage has received so much attention lately. The demise of the Soviet Union and superpower confrontation opened the public discourse door for a genuine shift in the scientific community's awareness of global environmental problems. What emerged was great concern over the earth's climate, which was previously thought to be relatively resilient and stable in the face of human insults, but now it is widely believed to be unstable because of man's global environmental activities.[10]

On the environmental side of the equation, Homer-Dixon identifies seven major environmental problems that could cause conflict inside and between developing countries: "greenhouse warming, ozone depletion, acid deposition, deforestation, degradation of agricultural land, overuse and pollution of water supplies, and depletion of fish stocks."[11] On the conflict side of the equation, he identified three types of conflicts likely to arise from environmental change in the developing world. They are "simple scarcity conflicts, group-identity conflicts, and relative-deprivation conflicts."[12] A simple scarcity conflict occurs "when state actors rationally calculate their interests in a zero-sum or negative-sum situation as might arise from resource scarcity."[13] He proposes that simple scarcity conflicts could arise over river water, fish, and productive farm land.[14] Next, group-identity conflicts occur from "large-scale movements of populations brought about by environmental change."[15] Last, relative-deprivation conflicts will occur "as

developing societies produce less wealth because of environmental problems, their citizens will probably become increasingly discontented by the widening gap between their actual level of economic achievement and the level they feel they deserve. The rate of change is key: the faster the economic deterioration…the greater the discontent."[16] Homer-Dixon explains the complexities of the issues by stating, "assessing the prospect for civil strife arising from environmental degradation in a particular society requires a through understanding of the society's social relations and institutions; its class, ethnic, religious, and linguistic structure; the culture of leadership in these groups and in society as a whole; and the beliefs about the social good that motivate challenger and elite groups."[17]

In a subsequent article, "Environmental Scarcities and Violent Conflict: Evidence from Cases," Homer-Dixon reports on the results of an international effort on this agenda. In general, he found that environmental scarcities are already contributing to violent conflicts in many parts of the developing world and the violence will usually be persistent but will not spread beyond national borders.[18] He also identifies the three main sources of scarcity of renewable resources as "environmental change, population growth, and unequal social distribution of resources."[19] The case studies he used to support his findings were varied and complex. In a study of the Senegal River Valley he illustrates where 'resource capture'[20] by one elite group, using unequal distribution of scarce land, resulted in "resource scarcity for an ethnic minority, expulsion of the minority, and ethnic violence."[21] He found in Bangladesh and Assam symptoms of environmental scarcity causing large population migration, which in turn caused group-identity conflicts.[22] The civil unrest by poor peasants in the Philippines against rich, large land holding elites,

clearly shows that "environmental scarcity (of agricultural land) simultaneously increases deprivation and disrupts key social institutions, which in turn causes 'deprivation' conflicts."[23] He concludes that the social impacts of environmental scarcity truly deserve more attention from security scholars.[24]

A 1998 article by Val Percival and Thomas Homer-Dixon, "Environmental Scarcity and Violent Conflict: The Case of South Africa," presented another case study. The study proposed that the violence that erupted after Nelson Mandela's release from prison was linked to the environmental scarcity caused by the apartheid regime. They contend that unequal distribution of agricultural lands, severe soil erosion, and rapid population growth caused environmental scarcity and was a major factor in the violent conflicts right before Mandela's election.[25] Clearly, from this case study, better understanding of the relationships between environmental problems and national and international security issues is needed.

The final case study is Colin H. Kahl's, *Population Growth, Environmental Degradation, and State-Sponsored Violence: The Case of Kenya*. Kahl researched the civil strife in Kenya from 1991-93. He found that "during the 1980s, population and environmental pressures led to an acute scarcity of arable land, rising economic marginalization in the countryside, and substantial rural-to-urban migration."[26] In addition, he found that the enormous growth of Kenya's population over the past five decades, combined with significant environmental degradation and a highly unequal distribution of good agricultural land, produced severe scarcity of arable land in Kenya.[27] Contributing to these problems was another environmental catastrophe. Eighty-three percent of Kenya's total land area suffered from some degree of desertification, and 19%

was severely affected.[28]   The final straw was a minority, elite government trying to stay in power by "manipulating a set of demographically, environmentally, and historically rooted land grievances"[29] to their advantage.   Kenya's rulers were able to pit ethnic groups against one another to maintain control and manipulate scarce resources.[30]   Again, we see a clear connection between environmental problems and security issues.   The case studies continue to point to environmental change, over population, and manipulation of scarce resources as major causes of acute conflict.   Most developing countries are inadequately prepared to deal with the insecurities caused by environmental degradation.   Third World populations are also growing much faster than their education systems and therefore they have little home grown scientific leadership to show the way to develop in sustainable ways.   Furthermore, they have little hard currency to buy state-of-the-art technology to prevent or mitigate pollution or degradation, and often sell renewable resources just to feed their people at the expense of their future development.   A vicious cycle that needs serious attention from all countries of the world that can help.

Notes

[1] Starr, Joyce R., 1991. "Water Wars," page 19. *Foreign Policy*, 82: 17-36.

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[3] Morris, Mary E., 1993. *Dividing the Waters: Reaching Equitable Water Solutions in the Middle East*, page 2. Santa Monica CA., RAND.

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[7] Ibid., page 126.

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[14] Ibid., page 107.

[15] Ibid., page 108.

[16] Ibid., page 109.

[17] Ibid., page 111.

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[19] Ibid., page 8.

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[22] Ibid., page 20

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Chapter 4

Conclusions

Now or never!

—Henry David Thoreau[1]

Which Path?

Are environmental problems national and international security issues? Clearly yes for four fundamental reasons. First, interstate violence caused by environmental problems has everything to do with national and international security. Any threat that can inflict harm or degrade the quality of life of a nation's citizens is a threat to national security. Second, any vehicle, national security debates, environmental controversy, or resource issues, that can harness the awareness and action necessary to prevent, mitigate, or intervene before environmental degradation or scarcity causes conflict is the right vehicle. Third, environmental degradation has and is contributing to international insecurity (Jordan and Israel fighting over water, India and Bangladesh warring over land) and will continue to do so in the future if the threats are not addressed properly. Finally, the belief that the military mindset predominant in national security issues and the environmental mindset found mostly in "civilian" issues are incompatible is also

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false.[2] I would hope that both military people and environmentalist both want peace, they may only disagree on how to attain it.

A clear link does exist between environmental problems, violent conflict, and international security. The only reason that the predictions in Chapter 1 of wide-spread pestilence, famine, and war did not come true then is because Julian Simon's faith in human ingenuity was rewarded.   Technology temporarily saved the day. Ronald Bailey in *EcoScam* states, "the 'Green Revolution' came along (at just the right time) and dramatically boosted crop production,"[3] and he noted that "just as Ehrlich was setting the fuse to his population bomb, 'a contraceptive revolution' was beginning."[4] The Neo-Malthusians were not wrong in their calculations, only in the timing.   The world's population is expected to reach six billion this summer. Furthermore, according to *E Magazine*, "the United Nations projects that 9.4 billion people will be sharing the planet by 2050, a number that will profoundly strain the world's natural resources."[5] We cannot continue to hope that 'technology will save the day' as the number of 'Haiti's' grow and pestilence, famine, and war march on hardly challenged.   Around the globe, environmental degradation caused by over population, poor resource management, and unequal distribution of resources is destroying the future of many countries.   Evidence of the portent for pestilence running rampant is being uncovered every day. For example, "most of the great plagues that have trimmed human numbers substantially have been triggered by some change in the environment or change in human behavior that has tipped the balance between human beings and disease organisms."[6] Gross environmental change is happening now, so is a global plague not far behind? World-wide famine may be also right around the corner. The growth in grain harvest has fallen behind that of

population and the grain fed to livestock and poultry is now the world's only food reserve in the event of a world food emergency.[7] Wars will undoubtedly continue to occur over scarce resources as seen in New Zealand's recent attacks on Chinese fishing boats pirating fish stocks off Antarctica. Another example is the enormous environmental destruction and on-going civil strife in Nigeria over who really should control the oil industry, Nigerians or multinational corporations. The debate is over and now is the time to find solutions to these environmental security problems. The paths we choose might determine the future.

Jim Motavalli foresees three potential paths to take in his article, "2000: Earth at the Crossroads." One path leads to "Fortress World of haves and have nots,"[8] where the wealthy, protected First World seals itself off from the deteriorating conditions in the Third World. The second path is to "Market World, a triumphant global capitalism uses the hidden hand of markets to bring forth technological innovations."[9] However, nowhere in "Market World" are the issues of sustainability, habitat/species protection, or equality brought out. The last path is to "Ecotopia: where corporate policy takes a green path, public opinion crystallizes around a shared sense of environmental commitment, international treaties stabilize energy use (and eliminate the internal-combustion engine), recycling eliminates waste, rainforests are saved, global climate preserved, and biodiversity loss halted."[10] What is the right path?

The Path Less Traveled

'Ecotopia' is the obvious choice, but how do we get there from here? The path to 'Ecotopia' demands prevention or mitigation of environmental degradation that threatens our national security through a capability for global intervention. But before a

framework for intervention is presented the parts of the environmental threats/causes/conflict equation must be reviewed for clarity. The parts are: environmental problems/threats, causes of environmental problems/threats, and types of resulting conflicts if intervention does not work. The threats to the environment and national security usually fall into the following categories identified by Homer-Dixon's research: "(1) greenhouse warming, (2) ozone depletion, (3) acid deposition, (4) deforestation, (5) degradation of agricultural land, (6) overuse and pollution of water supplies, and (7) depletion of fish stocks."[11] These environmental problems are caused by the factors discussed earlier: (1) over population (especially in less resilient ecosystems), (2) poor resource management, and (3) unequal resource distribution. The types of conflict that can result again come from Homer-Dixon's work, and they are: "(1) simple resource scarcity conflict, (2) group-identity conflicts, and (3) relative-deprivation conflicts."[12] These parts can be combined visually into an expanded Homer-Dixon model developed by James A Winnefeld and Mary E. Morris (see the Annex).[13] The model displays points of intervention that may prevent or mitigate degradation and conflict. The key is to understand the process of degradation and find out the root causes and make wise, sustainable corrections.

We have the satellite resources, we have the technology, we have the knowledge base, but we must find the funding, the leadership, and the will power to make sustainable corrections before the problems become irreversible. The United States should lead this effort, intervening, mitigating, or enforcing wise global choices. However, understanding when and how to prevent environmental degradation from reaching the point where global degradation is irreversible and violent conflict breaks out

is no easy task. Yet, there are solutions and options. The U.S., other developed countries, and the U.N. can head off conflict by preventing the causes of environmental degradation and show the world the right path to 'Ecotopia.' We in the U.S. can shape the future environment by choosing the sustainable future and use our military to respond to crisis, but we must prepare now by gaining knowledge and understanding the complexities of our world and our ecosystems. The developed countries should help the Third World produce sustainable harvests or provide affordable access to food supplies. Developing countries must be shown how to share fresh water and keep their sources replenished and unpolluted. The oceanic fisheries have to be shared by all nations and sustainable catch limits have to be imposed and enforced. The world's forests need protection from unsustainable harvesting and the fragile systems like rain forests must be protected from all development that will degrade them. All countries, large and small need recreational areas where wilderness is protected and people can return to their roots. Biodiversity must be protected world wide because when we lose a species to extinction we lose their potential benefits to all mankind. Climate change and energy consumption have to be addressed and brought under control through global teamwork. Waste disposal is an international threat to clean air, water, and habitat and it must be accounted for and disposed of properly. The last ingredient is population control. The U.S. must lead global family planning efforts. All young women on the planet should have access to family-planning services. Also, young girls have to be educated on the pro and cons of smaller families. Last, a world-wide campaign to convince couples everywhere that two children or less are the best and most sustainable numbers for a family must be developed.[14] All these activities will not happen without leadership from the United

States. The path we must choose is the least traveled and probably the most difficult.

Nevertheless, we can have a safe, clean, sustainable, prosperous, democratic, 'Ecotopia'

but, it truly may be 'now or never!'

Notes

[1] Thoreau, Henry D., 1993. *Walden or Life in the Woods*. Barnes and Nobles Books.
[2] Deudney, Daniel, 1990. "The Case Against Linking Environmental and National Security," page 461. *Millennium*, 19(3): 461-476.
[3] Bailey, Ronald, 1993. *EcoScam*, page 60. St Martin's Press, New York, NY.
[4] Ibid., page 60.
[5] Motovalli, Jim, 1999. "2000: Planet Earth at the Crossroads," page 29. *E Magazine.* 10(1): 29-35. Jan/Feb 1999
[6] Pirages, Dennis, 1995. "Microsecurity: Disease Organisms and Human Well-Being," page 6. *Washington Quarterly*, 18(4): 5-12.
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[9] Ibid., page 30.
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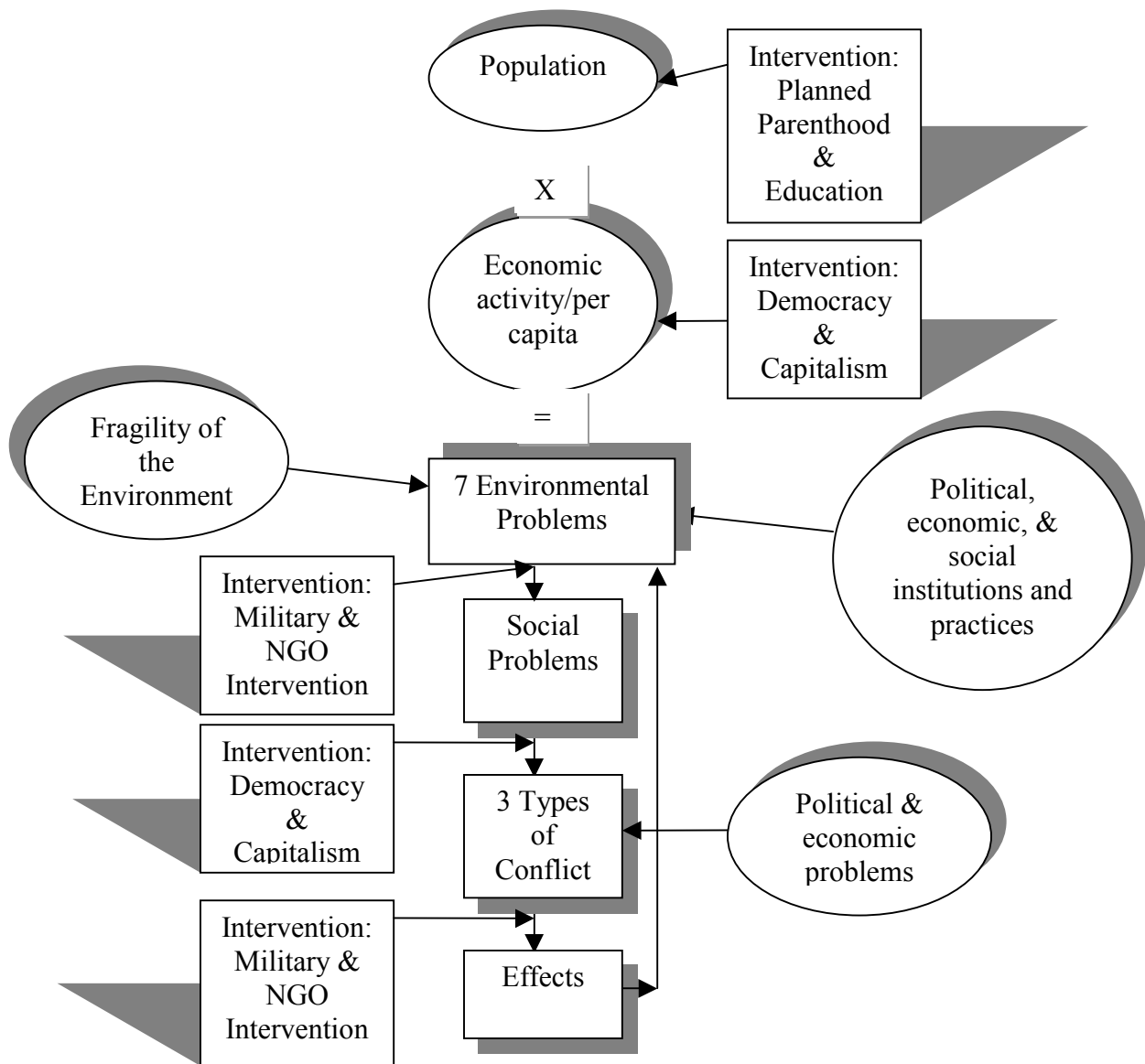[12] Ibid., page 104-114.
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Appendix A

Expanded Homer-Dixon Model

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