

AD-A278 469



PAGE

2

MARKINGS

1a. REPORT SECURITY CLASSIFICATION

Unclassified

2a. SECURITY CLASSIFICATION AUTHORITY  
N/A

2b. DECLASSIFICATION / DOWNGRADING SCHEDULE  
N/A

4. PERFORMING ORGANIZATION REPORT NUMBER(S)

NDU-ICAF-93-R812

3. DISTRIBUTION / AVAILABILITY OF REPORT

Distribution Statement A: Approved for public release; distribution is unlimited.

5. MONITORING ORGANIZATION REPORT NUMBER(S)

Same

6a. NAME OF PERFORMING ORGANIZATION  
Industrial College of the  
Armed Forces

6b. OFFICE SYMBOL  
(If applicable)  
ICAF-FAP

7a. NAME OF MONITORING ORGANIZATION  
National Defense University

6c. ADDRESS (City, State, and ZIP Code)  
Fort Lesley J. McNair  
Washington, D.C. 20319-6000

7b. ADDRESS (City, State, and ZIP Code)  
Fort Lesley J. McNair  
Washington, D.C. 20319-6000

8a. NAME OF FUNDING / SPONSORING  
ORGANIZATION

8b. OFFICE SYMBOL  
(If applicable)

9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER

8c. ADDRESS (City, State, and ZIP Code)

10. SOURCE OF FUNDING NUMBERS

PROGRAM  
ELEMENT NO.

PROJECT  
NO.

TASK  
NO.

WORK UNIT  
ACCESSION NO.

11. TITLE (Include Security Classification)

Transnational Environmental Degradation

12. PERSONAL AUTHOR(S)

Dary Thurston

13a. TYPE OF REPORT  
Research

13b. TIME COVERED  
FROM Aug 92 TO Apr 93

14. DATE OF REPORT (Year, Month, Day)  
April 1993

15. PAGE COUNT  
42

16. SUPPLEMENTARY NOTATION

17. COSATI CODES

| FIELD | GROUP | SUB-GROUP |
|-------|-------|-----------|
|       |       |           |
|       |       |           |
|       |       |           |

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

SEE ATTACHED

DTIC  
ELECTE  
APR 20 1994  
S B D

DTIC QUALITY INSPECTED 3

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT

☒ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS

21. ABSTRACT SECURITY CLASSIFICATION

Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL  
Judy Clark

22b. TELEPHONE (Include Area Code)  
(202) 475-1889

22c. OFFICE SYMBOL  
ICAF-FAP

# Transnational Environmental Degradation

by

Gary J. Thurston  
Defense Information Systems Agency

## Abstract

My paper discusses environmental issues which transcend national boundaries. A description of these issues is presented from a non-scientist, big picture point of view. My views are expressed as to how these environmental issues relate to United States national security, especially considering the world population growth doubling in the next sixty years. After discussing current environmental policies, I recommend future environmental policies.

|                    |  |
|--------------------|--|
| Accession For      |  |
| NTIS GRA&I         | <input checked="checked" type="checkbox"/> |
| DTIC TAB           | <input type="checkbox"/>                   |
| Unannounced        | <input type="checkbox"/>                   |
| Justification      |  |
| By                 |  |
| Distribution/      |  |
| Availability Codes |  |
| Dist               | Avail and/or<br>Special                    |
| A-1                |  |

**1993  
Executive Research Project  
RS12**

# **Transnational Environmental Degradation**

**Gary J. Thurston  
Defense Information Systems Agency**

*Faculty Research Advisor*  
**Colonel David L. Olson, USAF**



**The Industrial College of the Armed Forces  
National Defense University  
Fort McNair, Washington, D.C. 20319-6000**

**94-11889**



**DTIC QUALITY INSURED**

**94 4 19 065**

## **DISCLAIMER**

**This research report represents the views of the author and does not necessarily reflect the official opinion of the Industrial College of the Armed Forces, the National Defense University, or the Department of Defense.**

**This document is the property of the United States Government and is not to be reproduced in whole or in part for distribution outside the federal executive branch without permission of the Director of Research and Publications, Industrial College of the Armed Forces, Fort Lesley J. McNair, Washington, D.C. 20319-6000.**

## **Abstract**

My paper discusses environmental issues which transcend national boundaries. A description of these issues is presented from a non-scientist, big picture point of view. My views are expressed as to how these environmental issues relate to United States national security, especially considering the world population growth doubling in the next sixty years. After discussing current environmental policies, I recommend future environmental policies.

# TRANSNATIONAL ENVIRONMENTAL DEGRADATION

## Executive Summary

**Introduction.** My research paper provides policy options and recommendations for the Departments of Agriculture, State, Energy, Commerce, and Defense and the Environmental Protection Agency for responding to transnational environmental degradation which may threaten U.S. national security in the next decade. Examples are: water supply between nations, inadequate food supply within nations, air pollution to and from bordering nations, global Freon use depleting the ozone, and deforestation changing the earth's ecological system. These issues will be greatly magnified by the doubling of world population over the next sixty years.

**Background.** Beginning in 1991, global environmental concerns were identified in the U.S. National Security Strategy as contributing to international conflict. These concerns include diverse, but in some cases related, issues such as:

- climate change      ● food security      ● water supply
- deforestation      ● biodiversity      ● waste disposal
- ozone depletion      ● air and water pollution

These issues have no international boundaries: they are sources for international conflict.

**Policy Strategies.** Public policy concerning the environment can be classified into one of three general strategies: regulation, market approaches, and education. Factors such as political structure and culture can play an important role not only in understanding the variations in policy formation but also in explaining the impacts of the policies. International cooperation is key to formulating global environmental policy.

**Policy Options.** My suggestions are: 1) give environmental funding priority to those policies relating directly to human health and then to our human welfare, 2) pay particular attention to the environmental impacts caused by the population growth to the Africa and Asia continents, 3) produce and transfer food to developing nations in need, and 4) analyze whether U.S. fresh water collection and distribution systems can meet future need.

**Conclusions.** Policies should reverse adverse trends in transnational environmental degradation affecting human health first, then human welfare. This can also reduce the potential for international conflict. America can become a global leader in environmental matters by showing the way and making the sacrifice.

## Table of Contents

|   | <u>Page</u> |
|---|-------------|
| Abstract . . . . .  | ii          |
| Executive Summary . . . . .                               | iii         |
| Figures . . . . .   | v           |
| Introduction . . . . .                                    | 1           |
| U.S. National Security Interests and Objectives . . . . . | 2           |
| Impact of World Population Growth . . . . .               | 4           |
| Environmental Issues Affecting All Of Us . . . . .        | 6           |
| Environmental Policy . . . . .                            | 14          |
| Policy Options . . . . .                                  | 20          |
| Conclusion . . . . .                                      | 25          |
| Notes . . . . .   | A-1         |
| Bibliography . . . . .                                    | B-1         |

## Figures

| <u>Figure</u>                        | <u>Page</u> |
|--------------------------------------|-------------|
| 1. World Population Growth .....     | 4           |
| 2. Continent Population Growth ..... | 5           |



## Introduction

"We must manage the Earth's natural resources in ways that protect the potential for growth and opportunity for present and future generations. ... A healthy economy and a healthy environment go hand in hand."<sup>1</sup>

The above quote from the August 1991 National Security Strategy highlights the changing world for U.S. national security. When developing our strategy in the 1970s, "international" economics emerged as a national interest. The domestic economy was no longer the independent force it had once been, but was powerfully affected by economic policies in dozens of other countries.

The January 1993 National Security Strategy acknowledges this change: "the distinction between domestic economic policy and international economic policy is disappearing. ... United States' economic strategy must be global rather than national. It must include increased attention to the range of new issues on our agenda: environmental degradation, population pressures in developing countries, migration and refugees, disease and other health problems."<sup>2</sup> Already, these issues are breaking up national sovereignty.<sup>3</sup>

My paper addresses 1) transnational environmental degradation implications, both direct and indirect, for U.S. national security; 2) the additional pressure brought about by the population growth of developing nations; 3) policy options for responding to environmental degradation and the threat it creates; and 4) policy recommendations.

## **U.S. National Security Interests and Objectives**

Let me begin with the foundation to the United States National Security Strategy by restating the fundamental rationale of our national security interests and objectives:

**"The United States must ensure its security as a free and independent nation, and the protection of its fundamental values, institutions, and people. This is a sovereign responsibility which we will not abdicate to any other nation or collective organization."**

The approach to strengthen this foundation is through a strategy of seeking:

- Global and regional stability which encourages peaceful change and progress.
- Open, democratic and representative political systems worldwide.
- An open international trading and economic system which benefits all participants.
- An enduring global faith in America — that it can and will lead in a collective response to the world's crises.

Prior to 1991, our national security strategy focused on political, military and economic challenges to our national interests and objectives: the most significant was the Soviet Union. Now, with the Cold War over, there is no single, defining threat. The August 1991 and January 1993 national security strategies list key global environmental issues that could influence our national interests and objectives. They are:

- climate change      ● food security      ● water supply
- deforestation      ● biodiversity      ● waste disposal
- ozone depletion      ● air and water pollution

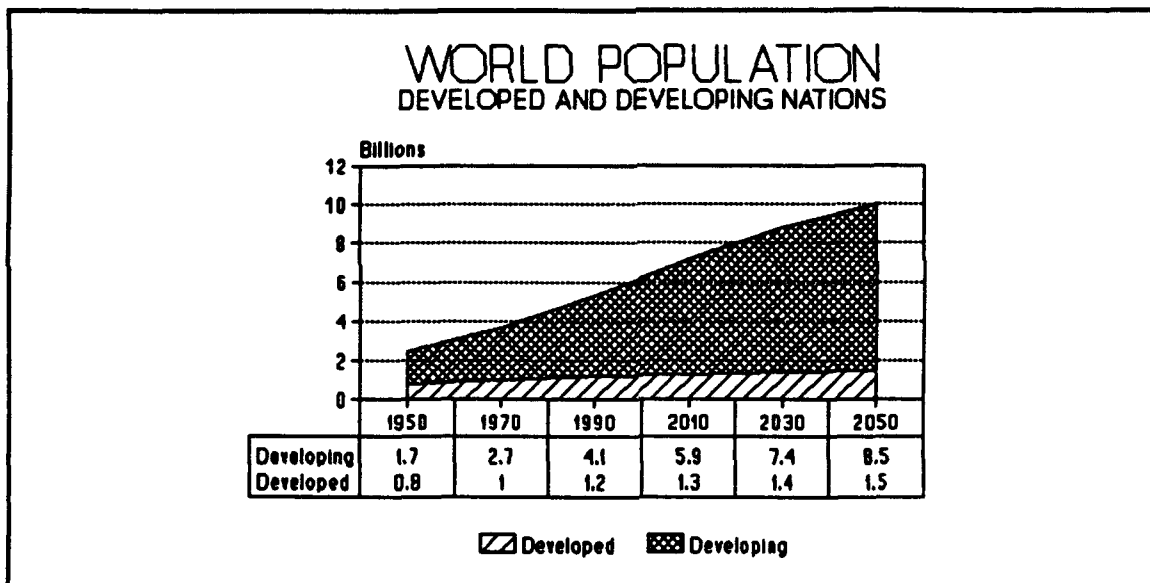
The costs to study and control these issues are limiting global economic development. Public awareness of these issues is growing every year. Many environmentalists are flogging us with the doomsday theory, while others can not agree on the causes nor the effects. What is a reality is the fact that we face a severe environmental problem—which translates to an economic problem—if we do not face up to the degradation soon. And by facing up to it I mean stopping the degradation by education and solid financial support. One approach was recognized in the August 1991 National Security Strategy:

- Achieve cooperative international solutions to key environmental challenges, assuring the sustainability and environmental security of the planet as well as growth and opportunity for all.

Before addressing the United States position on international environmental solutions, I wish to describe the world population dimension and then review them as they relate to U.S. national security.

## Impact of World Population Growth

"It is the absolute numbers of people, not their rates of growth, that affect the environment."<sup>5</sup> The world has just gone through a major growth spurt by doubling the number of people in just the last forty years: from 2.5 billion to 5 billion. Another doubling is likely to occur within the next sixty years to 10 billion. Most of this growth has come and will come from the developing nations (see Figure 1).



**Figure 1. World Population Growth**

The rates of growth are decreasing, which is why it will take sixty years vice forty years to double the population again. The developing nations have adopted various versions of "family planning;" however, some cultures have been slow to adopt a strategy. The impact of ten billion people "living" on this planet will depend on the standard of living and the technologies

used to support that standard. If the developing nations seek higher standards of living with inefficient technologies, it can only lead to continued damage to local and global environments.<sup>6</sup> International leadership is required to manage global population growth before threatening U.S. national interests.

Figure 2 illustrates that the center of gravity for world population growth is on the African and Asian continents.<sup>7</sup> Lacking massive emigration, Africa and Asia will demand most of the world's already limited resources. Whether these continents can peacefully sustain seven billion people leads to many lengthy debates. (Note: One potential population adjustment—not dealt with in this paper—is the AIDS epidemic in Africa.)

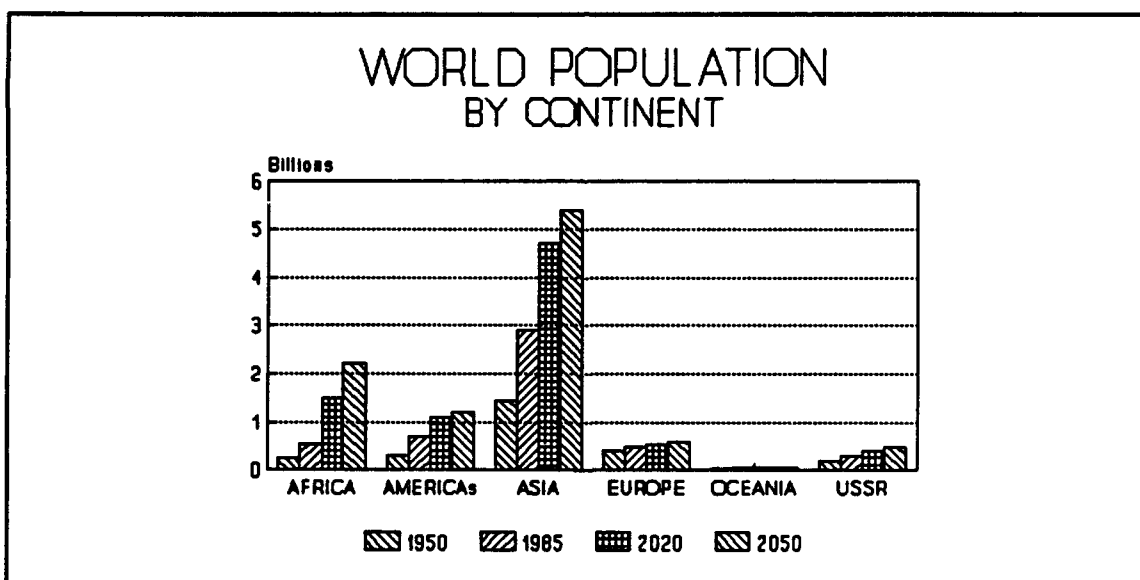


Figure 2. Continent Population Growth

The bottom line is that the world population increase alone will intensify transnational environmental issues and be most prevalent in the developing countries.

## **Environmental Issues Affecting All Of Us**

The environmental issues that affect us are divided into two distinct categories: human health and human welfare. Those that directly affect us as a risk to our human health are:

- Water supply
- Air and Water pollution
- Food security

And those that are relatively high risks to our natural ecology and human welfare are:

- Deforestation
- Waste disposal
- Ozone depletion
- Global climate change
- Biodiversity

These environmental issues do not stand alone—they are all interrelated.

Consensus on the magnitude of each issue has not yet been reached and there remains an uncertainty of the actual trend for some of the ecological issues. Also, there is no pure objectivity in stating the cause or effect of these issues, for everyone studying them is being compensated by someone. The

following paragraphs provide a high-level description of each listed environmental issue. First, those environmental issues that directly affect our human health.

**Water Supply:** The concern is meeting the quality and quantity needs of domestic, industrial, and agriculture use on a global basis. The total quantity of water on Earth has been constant for millions of years. The distribution of water between the land, ocean, and atmosphere has been relatively stable. It is believed that solar activity is the principal factor that governs this distribution. Therefore, the concern for the water supply is not the total amount but is the distribution.

Distribution on land is brought about by nations creating collection, storage, treatment, and transmission systems for all users. Humans use about 25% of the world's fresh water supply, although about 40% of the world population today does not have enough water.<sup>8</sup> With the world population growth likely to double within the next sixty years, tensions and conflicts will arise from both the lack of and the adequate distribution of water.

There are two reasons why the water supply is influencing U.S. national security. First, world population growth will impact the balance of water on land. As developing nations create water reservoirs and sophisticated distribution systems, a reduction in the availability of water for the U.S. is expected. Also, human consumption rates continue to grow and magnify the problem.

Second, regional wars could break out over water. One nation's reservoir could create another nation's "desert." These regional conflicts could threaten U.S. interests.

***Air and Water Pollution:*** The concern is the degradation of the natural resource by insertion of contaminants from man. Air and water pollution are interlinked by the hydrologic cycle which continually circulates water. The contaminants in the air end up in water and the contaminants in water end up in air, all the time transversing Earth due to weather. This is how pollution from one nation spills over into another.

In centuries past, land would be a filter providing us clean water and air. Today, our agricultural fertilizers, industrial air and water pollution, and emissions from transportation systems are the major pollutants. "Acid rain" originated with the industrial revolution—mid 1800's—and is a vivid illustration of this issue. For almost 150 years, we have been attempting to deal with pollution through economic, legislative, and administrative policies.

The Clean Air Act of 1972 and the Clean Water Act of 1970 have been the most effective domestic approach to this issue. The U.S. has been very successful in reducing the transportation system's impact to air pollution over the last 20 years—a decrease of 95%. So successful that the Clean Air Act Amendments of 1990 have shifted the focus from clean-up to prevention. The U.S. approach and technology should be shared with other nations



before their pollutants end up in the United States.

**Food security:** The concern is whether the per capita food supply in the developing countries can be maintained. Even though the diets of the developing countries, on average, are inadequate energy and protein.'

The developed nations have the capacity to satisfy the food needs of the world. The biggest problem is in transporting it to them. If the food security problem is approached as a global one, like it has been a national one, it can be solved and global economic growth could be realized.

With the Cold War over, all developed nations could reallocate their military expenditures to provide and transport food products to developing nations. Exporting food from developed nations—the U.S. is the largest—to developing nations could provide for long term economic growth by maintaining and possibly raising the per capita food supply of the developing nations.

Failure to produce, process, and transport food globally will exacerbate shortages which already exist in some countries and could virtually lead to widespread famine. We are already observing evidence of food security requiring international support by the situations in Somalia and Bosnia. The number of armed forces supporting these situations is dependent upon the regional threat and U.S. national interests. However, the U.S. is likely to continue to get involved from just a humanitarian

viewpoint. The U.S. must stabilize food deprived regional areas before they threaten world peace.

And now a description of the environmental issues that affect our natural ecology and human welfare.

**Deforestation:** The concern is the destruction of forests for the use of fuel, wood products, and agriculture. It includes the slow growth brought about by airborne pollutants — acid rain. Forests can be renewable resources with sound forestry policies and reduced pollutant levels. Most of the developed nations have adopted these policies. However, developing nations, for the most part, have increasing demand for forest products and are slow to replenish, if at all, their forests.

Some current economic policies undermine environmental incentives. For example, below-market timber sales, tax breaks, and subsidized interest rates for development in forest areas are encouraged in developing nations. The destruction of the trees of the forest, also brings destruction of the plant and animal species within it. This will be discussed later.

So far, the threat of serious environmental damage from deforestation is regional and not global. Yet, the principal threat of deforestation is to water and soil quality.<sup>10</sup> However, if aggressive forestry management programs are not established and enforced in the next decade in developing nations,

deforestation will begin to over-pressure local systems and could become a global problem. Planting trees to meet demand for forest products is the basic strategy to forest management.

The unanimous adoption of the Statement of Forest Principles at the Earth Summit in 1992 is a giant step forward. This document, although not legally binding, addresses 15 principles regarding the management of global forests and is the first global consensus on the protection and development of forests.

***Waste Disposal:*** The concern is the "placement" of residential and industrial waste on land and in water which leads to air and water pollution. A global threatening example is waste dumping in swampy areas. In some instances, these pollutants are not adequately contained and they can transverse globally via weather as discussed in the air and water pollution section. Besides the weather transfer, wetland pollution can be spread by migratory birds.

One positive movement on global waste disposal is the treaty on the export of hazardous waste. The treaty requires the sending government to obtain a written permit from the receiving government for the hazardous waste. It is doubtful the treaty does much to reduce pollutants, but at least it gets governments talking to each other about transnational environmental issues.

***Ozone depletion:*** The concern is the depletion of ozone is raising

ultraviolet radiation levels on the earth surface, thus increasing skin cancer and global warming. Ozone is produced naturally in the stratosphere by the interaction of sunlight with oxygen. Although present in only small concentrations, ozone blocks out highly damaging solar ultraviolet radiation and traps heat energy from the sun in the earth's atmosphere. Ozone is destroyed by the chain reaction involving nitrogen, hydrogen, and chlorine compounds.

Stratospheric ozone depletion threatens the U.S. by high health care costs to treat and do research on skin cancer. The effects on both plant and animal food production, resulting from global warming, are not yet clear and will require further assessment.

Scientists during the 1970's determined that the atmospheric release of chlorofluorocarbons (CFCs), such as Freon, contributes to depleting the ozone layer. In 1987, 31 nations—including the United States—signed the Montreal Protocol to freeze their levels of use of CFCs and to reduce their consumption of them by 50 percent or more by 2000. In 1990, an amendment was adopted for quicker reduction with a total phase out of CFC consumption by 2000. Also adopted in 1990, amendments for financial and technical assistance were provided for developing nations. The cooperation demonstrated by all involved nations has led China, India, and Brazil to sign up to the Montreal Protocol.<sup>11</sup>

The Montreal Protocol is the best example of global cooperation among developed and developing nations to address a

complex environmental concern. It is a model to be followed for solving other global environmental issues.

***Global climate change:*** The concern is that the global temperature is increasing more than it has in the past due to pollution and ozone depletion. Yet, no definitive scientific conclusions have been reached. In fact, recent studies suggest that the temperature of the sun and not global environmental factors may be causing the global climate changes. There is not enough evidence for the issue to be considered as threatening anything and more research is required before establishing policy for this issue.

***Biodiversity:*** The concern is the destruction of plant and animal species brought about by the decline of forests, degradation of coral reefs, and loss of wetlands. The threat is the depletion of unique genetic resources, particularly those confined to limited areas of tropical forests. An example is that one of the most effective medicines for the treatment of leukemia is made from a plant found in Amazonia.

The probability of serious damage in the next decade is minimal and the risks have been exaggerated. Preparation of environmental statements and sound forest policies are modest measures which can reduce the irrevocable loss.

## **Environmental Policy**

**Background.** Environmental policy is a relatively new area of public policy concern. Threats and potential threats to the environment have come to light only recently. Many are the direct result of industrial and technological developments.

Governments are having difficulty in formulating comprehensive environmental policies. First, although in other areas government intervention is thought to provide economic benefits, environmental protection is often viewed as a hindrance to economic growth and development. For example, measures taken to reduce pollution usually add to the costs of production and can put a nation at a trade disadvantage when competing with countries with less stringent environmental policies.

Second, many of the threats to the environment transcend national boundaries. A country might be able to regulate the levels of pollutants emitted into the air or water from within its borders, but it cannot stop pollution emanating from a neighboring country. No embargoes or restrictive tariffs can directly limit the importation of air and water pollution. International cooperation is needed in formulating global environmental policies.

Public policies concerning the environment can be classified into one of three general strategies: **regulation, market approaches, and education.**<sup>12</sup> They are listed in descending order of government intrusiveness or authoritativeness. These

strategies, however, are not mutually exclusive. Factors such as political structure and culture play an important role not only in understanding the variation in policy formulation but also in explaining the impacts of the policies.

The most restrictive and intrusive policy strategy is **regulation**. Environmental regulations have been established both to prevent future threats to the quality of the environment and to clean up and reduce current pollution problems. A regulatory approach usually is confrontational, with sanctions imposed for noncompliance. The people or industries affected by such regulations are forced to do something they probably would not do otherwise -- if they would do it on their own, there would be no need for the regulation.

One other aspect of regulation use is when government has to intervene in the marketplace because free competition does not adequately or fairly regulate the supply, price, and distribution of goods or services.

**Market approach** strategies represent a shift toward conciliation and away from the confrontation of regulation. In this way, potential polluters are encouraged rather than forced to cooperate. Market approaches are less intrusive than direct regulation in that potential polluters maintain the option of not complying with environmental standards if they are willing to absorb the economic costs. Nations that emphasize market

approaches (e.g., Germany and Israel) report more success than those that rely heavily on regulation. The U.S. is recognizing it must move in this direction for more effective protection of the environment and has so stated in the 1991/92 National Energy Strategy.<sup>13</sup>

The least intrusive type of government intervention is to provide public education about environmental concerns. Education is seen primarily as an attempt to provide long-term results.

The National Environmental Education Act was passed in 1990 with four years of funding beginning in 1992. This \$44 million bill is to increase public understanding of the natural environment and to advance and develop environmental education and training. The Environmental Protection Agency is chartered to renew and reestablish the Federal role in environmental education. It is designed to complement the existing environmental education programs now being implemented by nonprofit organizations and local and State government educational agencies.<sup>14</sup>

I will use automobile pollution as an example to describe the three types of policy approaches. The regulation approach would set corporate average fuel economy (CAFE) standards to reduce pollutant emissions. This would force automakers to produce more efficient automobiles. The market approach would tax gasoline. Consumers would then have a choice, yet encouraged, of which automobile to drive.<sup>15</sup> The education



approach would attempt to make the consumer fully knowledgeable of his decision to operate a particular automobile. Hoping that he would understand the environmental impact of his decision.

**Current Environmental Policy.** The Montreal Protocol and the Hazardous Waste Treaty are key global environmental policy actions. Other new policies were also initiated at the United Nations Conference on Environment and Development in Rio de Janeiro in June 1992. This was the largest and most complex conference ever held, with 128 national leaders attending and 180 nations participating. The conference was to establish a global partnership on global environmental actions and a nation's right to development. The goals of the conference were:<sup>16</sup>

- Establish sound environmental and development policies for the 21st century
- Adopt "Earth Charter" and the "AGENDA-21 plan"
- Sign treaties for climate change and biodiversity

AGENDA-21 is the plan to confront and overcome the economic and ecological problems of the late 20th century. The plan provides a comprehensive blueprint for humanity to use to forge their way into the next century by proceeding more gently upon the Earth. "The most politically difficult issues to be resolved were aspects of AGENDA-21 regarding financing and the transfer of environmentally sound technology to developing nations."<sup>17</sup>

The financial equation of the partnership was for the developed countries to finance \$125 billion per year and the developing countries to finance \$400 billion per year through the year 2000 to implement all activities of the AGENDA-21 plan. The U.S. has made no financial commitment to the plan. But, an agreement was instituted recognizing that development must be kept within the limits of the long term carrying capacity of the Earth's ecosystems: now referred to as sustainable development.

For the transfer of technology issue, the developed countries agreed in principle that developing countries need to have access to environmentally sound technology. However, there is intense disagreement on how to transfer the technology—sell or give. Such transfer will require enormous international cooperation to balance the environmental dangers and the economic costs.

Effective leadership and direction are clearly required for managing global environmental degradation. Former President George Bush had announced in his 1988 presidential campaign that it was his intention to be "the environmental president." But he was criticized by many environmentalists who believe that the U.S. had failed at being a global leader at the United Nations Conference on Environmental Development (Earth Summit). U.S. policy at that time was not to sign up to any worldwide environmental regulation which could financially burden our industry or taxpayers. Others said that what was being pushed through the conference was not right for all nations and the

burden of financing on the developed nations could not be agreed upon.

Former President Bush did not sign the biodiversity treaty because it called upon developed nations to give the developing nations financial incentives to protect endangered plants and animals. In his view the trade-off was for American jobs rather than the endangered plant and animals.

The remaining question to the Earth Summit is how many nations will take action on their own accord or how many nations will sit and wait for money. In summary, all nations at the Earth Summit agreed to do something but, when will they take action?

President Clinton and Vice-President Gore have stated that they "believe that environmental protection is fundamental to America's national security." And have further stated, "We will renew America's commitment to leave our children a better nation—a nation whose air, water, and land are unspoiled, whose natural beauty is undimmed, and whose leadership for sustainable global growth is unsurpassed."<sup>18</sup> We will have to wait and see how the Clinton administration policies and budgets endorse these statements.

## Policy Options

For this policy options section, I will deal only with the environmental issues affecting human health directly. The environmental issues affecting our human welfare ecological system are important but require more in-depth research and analysis. I will talk about policy in general and then make recommendations about water supply, food security, air and water pollution, and population growth.

General Policy. The U.S. should ask itself if it has the correct financial balance of environmental spending towards direct and indirect environmental issues. Also, global environmental policies should consider Africa and Asia population explosions. These continents already have serious environmental issues increasing international conflict. Considering the population growth, these areas will only increase in pressure points affecting international relations.

The U.S. should take firm action, to include financial support, on the AGENDA-21 plan. The U.S. needs to demonstrate more concern for the environment and integrate it into individual and collective decision-making. Even though the outlook for full financing is bleak, strong U.S. action on the AGENDA-21 plan would get the U.S. back into being a global environmental leader. American industry and taxpayers will have to recognize just what the options are: we can pay now or pay a lot more later.

There may be military expenditures worldwide which can be reduced to pay for "cleaning the Earth." This was not possible just fourteen years ago as pointed out by Gilland in 1979.<sup>19</sup> He cites the following objections to reducing military expenditures that are no longer valid:

1. Soviets would not reduce military spending.
2. Other nations were not willing to decrease because the Soviets were not willing.
3. Developed nations were unwilling to give aid just for growth to developing nations.
4. Developing nations receiving aid were ineffective to utilize aid.

With the Cold War over and lessons learned from foreign aid programs, global military expenditure reductions just might be able to begin solving global environmental problems.

Water Supply Policy. I mentioned that solar activity was believed to be a factor in distribution of water as well as other environmental issues. We should be sure to focus the study of the sun on water distribution as well as on ozone depletion and other global climate change agents.

We should analyze our fresh water collection and distribution systems to be sure they are in balance with our population and industrial needs, especially with the global

population growth forthcoming. Failure to have a global understanding of water supply could lead to expanded shortages of water far greater than the U.S. regional water supply problems brought on by cyclic water tables. Failure of this understanding will mean the U.S. will not be able to pinpoint blame on anyone when a shortage occurs. I envision the U.S. then blaming Canada and weakening a good relationship.

I must point out that environmentalist have played critical roles in limiting the number of aqueducts and reservoirs for environmental reasons.<sup>20</sup> The pendulum must swing back or some will lack a vital human resource—water—for direct consumption and also for production of food products.

Food Security Policy. Increased food processing and transportation to developing nations could bring about global economic growth. The U.S. can produce food by changing policy. Pull land out of soil banks to free up funds to finance increased production and processing. This will create jobs where we already have trained personnel and have developed efficient food production processes. Military resources could be used for transportation.

The Somalia and Bosnia situations are recent conflicts requiring military resources to solve food shortages. Some short term efforts of sending food instead of aid—which creates jobs in the U.S.—could reap long term growth. Or we can continue to pay for not growing in the U.S. and giving aid away for foreign

attempts at food production.

Air and Water Pollution Policy. There must be stronger enforcement of the Clean Air and Clean Water Acts. We must expound success stories where the environment has been cleaned-up and industry products are still competitive. Yes, this does not make great press and there are examples of failure. But, the U.S. public must be educated on how effective the Clean Air and Clean Water Acts have been. America has been a place of innovative technological advances and can continue to be. Although, the U.S. usually has its back up to the wall before something is done. The U.S. must continue the innovation without the pressure.

Trash recycling is both an education and market approach that is executed by the goodwill of the people and industry. Separation of paper, plastics, glass, and metal from all other "trash" reduces the amount of waste transfer to land. We need to create and expand the markets for the recycled waste. If not, regulation will be our only alternative of control.

One innovative program coming along slowly is electric powered vehicles to reduce air pollution. So far, an environmentally sound, cost effective, and acceptable vehicle has not been developed. Presently, battery power has significant drawbacks -- limited range and speed and, more importantly, the environmental problems of production and disposal. A cooperative research and development program, sponsored jointly by the

government and automakers, could produce batteries which are lighter in weight and less hazardous to the environment. A breakthrough in electric vehicles will reduce global environmental degradation and reduce petroleum dependency.

Population Growth Policy. I refer back to my general policy discussion on global military expenditures. The United Nations recently estimated that an investment of \$10.5 billion each year for ten years could stabilize world population in the mid to late 21st century. This is only about one percent of the world's annual military expenditures. If financing of family planning efforts received support, the environmental stress brought on by global human population would be in check.

However, the United States populace and political leaders have not been able to separate the abortion issues from family planning efforts. The U.S. leaders must understand the difference and support—finance—family planning efforts.<sup>21</sup> In the end, the intensity of transnational environmental issues would be in check.



## Conclusion

In 1962, Rachel Carson began to explain the "balance of nature" in her book *Silent Spring*. We have come a long way in the last thirty years to understand the delicate balance she was describing between humans and their impact of technology on nature. We must press on with understanding the environmental impacts we have created and do something about them.

Recently, we have gotten on another path with Earth warming, ozone holes, and biodiversity instead of dealing globally on vital human resource needs: water, food, and air. Implementation of the aforementioned policy statements will reduce the effects of humans on nature. These changes can also lead to a more peaceful planet having sustained development.

The biggest environmental challenges to assure the sustainability and environmental security of the planet are twofold:

- Reduce environmental impacts in the developed nations.
- Preclude environmental impacts in the developing nations.

In the end, a higher standard of living can be obtained by all.

## Notes

1. National Security Strategy of the United States, the White House, August 1991, p. 22.
2. National Security Strategy of the United States, the White House, January 1993, p. 9.
3. Jessica Tuchman Mathews, "Redefining Security", Foreign Affairs, Spring 1989, p. 162.
4. National Security Strategy of the United States, 1993, p. 3.
5. Nathan Keyfitz & Wilhelm Flieger, World Population Growth and Aging, 1990, p. 3.
6. Global Environmental Change, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, National Academy Press, Washington, D.C., 1988, p. 4.
7. Keyfitz, p. 104.
8. Diane Raines Ward, "Water's worth", World, Vol. 26, Issue 2, 1992, p. 25.
9. Bernard Gilland, The Next Seventy Years- Population, Food, and Resources, Abacus Press, 1979, p. 1.
10. Roger A. Sedjo and Marion Clawson, Global Forests, Resources for the Future, Washington D.C., 1984, p. 167.
11. "CFC reduction - technology transfer to the developing world," U.S. House of Representatives, 11 July 1990, pp. 16-18.
12. International Public Policy Sourcebook, Education and Environment, edited by Fredric N. Bolotin, Vol. 2, Greenwood Press, pp. 189-93.
13. "Powerful Ideas for America", National Energy Strategy, Executive Summary, 1991/92, p. 26.
14. National Environmental Education Act, Report 101-671, 4 August 1990, pp. 1-11.
15. James A. Swaney, "Market versus command and control environmental policies", Journal of Economic Issues, June 1992, Vol. 6, Iss. 2, p. 627.

16. AGENDA 21: The Earth Summit Strategy to Save Our Planet, edited by Daniel Sitarz, 1993, pp. 6-8.
17. Ibid., p. 24.
18. Governor Bill Clinton and Senator Al Gore, Putting People First: How We All Can Change America, 1992, pp. 93-4.
19. Gilland, pp. 96-7.
20. Marc Beauchanap, "Drought," Forbes, 23 July 1990, p. 113.
21. Jim L. Bowyer, "Human Population and Natural Resource Demands," Montana Business Quarterly, Summer 1992, p. 16.

## Bibliography

- Allman, W. F. (1992, June 8). Climate and the rise of man. US News & World Report, pp. 60-67.
- Beauchanap, M. (1990, July 23). Drought! Forbes. pp. 113,116.
- Bolotin, F. N. (1985). International public policy sourcebook, education and environment. Greenwood Press, editor.
- Bowyer, Jim L. (1992, Summer). Human population and natural resource demands. Montana Business Quarterly, pp. 15-20.
- Bregman, J. I. (1989, June). How to clean up the mess. The World & I, pp. 32-37.
- Budiansky, S. (1992, June 22). Giving green a bad name. US News & World Report, pp. 16-17.
- Carpenter, B. & Zimmermann, T. (1992, June 29). Spying on the Earth. US News & World Report, pp. 66-67.
- Chengappa, R. (1992, June 15). The wounded Earth. India Today, p. 69.
- Clinton, B. & Gore, A. (1992). Putting people first: how we can all change America, pp. 93-9.
- Ellsaesser, H. W. (1989, June). The siren song of environmentalism. The World & I, pp. 50-53.
- Gilland, B. (1979). The next seventy years - population, food, and resources, Abacus press.

Global Environmental Change. (1988). National Academy of Sciences, National Academy of Engineering, Institute of Medicine, National Academy Press, Washington, D.C.

Jeffreys, K. (1992, June). The 'Private' approach works. The World & I, pp. 42-49.

Keyfitz, N. & Flieger, W. (1990). World Population Growth and Aging.

Linden, E. (1992, June 1). Population: the uninvited guest. Time, p. 54.

Mathews, J. T. (1989, Spring). Redefining security. Foreign Affairs.

National Energy Strategy. (1991/92). Powerful Ideas for America. National Energy Strategy.

National Environmental Education Act. (1990, August 4). Report 101-671.

National Security Strategy of the United States. (1991, August). The White House.

National Security Strategy of the United States. (1993, January). The White House.

Pope, V. (1992, April 13). Poisoning Russia's river of plenty. US News & World Report, pp. 49-51.

Satchell, M. (1992, November 30). The mess we've left behind. U.S. News & World Report, pp. 28-31.

Sedjo, R. A. & Clawson, M. (1984). Global forests, resources for the future, Washington, D.C.

- Sitarz, D. (1993). AGENDA 21: the earth summit strategy to save our planet. Earth Press, Boulder Colorado, editor.
- Speth, J. G. (1992, June). Needed: a global response. The World & I, pp. 38-41.
- Staglin, D. (1992, April 13). Breathing sulfur and eating lead. US News & World Report, pp. 46-49.
- Statistical Abstract of the United States. (1992). U.S. Department of Commerce.
- Swaney, J. A. (1992, June). Market versus command and control environmental policies. Journal of Economic Issues. pp. 621-633.
- U.S. House of Representatives hearing, "CFC reduction - technology transfer to the developing world," U.S. Government Printing Office, Washington, 11 July 1990, p. 149.
- Ward, D. R. (1992). Water's worth. World, Issue 2, p. 26.
- The World & I. (1989, June). The environment: Striving for global balance. The World & I, Editor. pp. 20-21.