AN ABSTRACT OF THE THESIS OF


Title: Biological Diversity and Third World Development: A Study of the Transformation of an Ecological Concept into Natural Resource Policy

Abstract approved: Gordon E. Matzke

This work examined the transformation of the concept of biodiversity into natural resource policies of the U.S. Agency for International Development and the World Bank through 1988. The study identified several groups as playing key roles in the transformation process. These were nongovernmental environmental organizations, the scientific community, and the U.S. Congress.

As a framework for analysis, a Process Model is presented which depicts the process that transforms a scientific concept into natural resource policy. As a result of this research, modifications to the original Process Model are proposed. Though this study focuses on the scientific concept of biological diversity, it is suggested that the Process Model may be more broadly applied to other resource issues which follow the model's general steps of concept formulation, value identification, legislation development, and policy formulation. Several conclusions are reached from
this study. One is that though there was little agreement about the concept of biodiversity within the scientific community, three broad themes evolved. These themes are ecosystem diversity, species diversity, and genetic diversity.

Second, NGEO members did not adopt scientific concepts of biodiversity, but rather developed value positions with respect to biodiversity. These positions were presented to lawmakers the result being that biodiversity legislation was narrowly focused and did not fully reflect the three major diversity themes developed within the scientific community.

Finally, policies developed by agencies responsible for implementing biodiversity legislation reflected Congressional intent and were equally narrowly focused. One consequence is that only selected major biodiversity themes are dealt with in agency policy, and this is reflected in agency funded programs to conserve biological diversity.
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The dissertation process is a curious one. It contains elements which are unique to each individual, yet there are elements which are common to all. One common element is that even though the individual author is ultimately responsible for the final document, many people make valuable contributions along the way. This is to acknowledge those who made valuable contributions to the successful completion of my dissertation.

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# TABLE OF CONTENTS

## CHAPTER ONE—INTRODUCTION

- Problem Statement
- Objectives
- Methods

## CHAPTER TWO—SCIENTIFIC VIEWS OF BIOLOGICAL DIVERSITY

- Classification and Description
- Diversity Pattern Recognition and Explanation
- Conservation of Biodiversity
- Discussion

## CHAPTER THREE—NONGOVERNMENTAL ENVIRONMENTAL ORGANIZATIONS AND BIOLOGICAL DIVERSITY

- Worldwatch Institute
- World Resources Institute
- International Union for the Conservation of Nature
- World Wildlife Fund
- The Nature Conservancy
- Discussion

## CHAPTER FOUR—BIOLOGICAL DIVERSITY AND INTERNATIONAL AID AGENCIES

- U.S. Agency for International Development
- The World Bank
- Discussion

## CHAPTER FIVE—SUMMARY AND CONCLUSIONS

## BIBLIOGRAPHY

## APPENDICES
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time frame of scientific interest in biodiversity as discussed in text</td>
<td>11</td>
</tr>
<tr>
<td>2. Generalized distribution of the tropical rainforests</td>
<td>22</td>
</tr>
<tr>
<td>3. Average number of woody plant species found in a .1 hectare plot at different latitudes</td>
<td>23</td>
</tr>
<tr>
<td>4. Number of breeding land bird species found at different latitudes</td>
<td>23</td>
</tr>
<tr>
<td>5. Low- and middle-income economies</td>
<td>33</td>
</tr>
<tr>
<td>7. Cumulative tabulation of biodiversity articles published in 3 environmental magazines</td>
<td>38</td>
</tr>
</tbody>
</table>
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Various definitions of stability</td>
<td>18</td>
</tr>
<tr>
<td>2. Estimates of the total number of all species found in tropical forest ecosystems</td>
<td>25</td>
</tr>
<tr>
<td>3. Causes of species loss</td>
<td>26</td>
</tr>
<tr>
<td>4. Estimate of projected deforestation rates</td>
<td>27</td>
</tr>
<tr>
<td>5. Estimate of potential extinction rates of species in the tropics</td>
<td>29</td>
</tr>
<tr>
<td>6. First content analysis of NGEO representatives’ testimony given during the 1985 Congressional hearings on biodiversity</td>
<td>60</td>
</tr>
<tr>
<td>7. Second content analysis of NGEO representatives’ testimony given during the 1985 Congressional hearings on biodiversity</td>
<td>64</td>
</tr>
<tr>
<td>8. Content analysis of 9 articles written by NGEO representatives</td>
<td>65</td>
</tr>
<tr>
<td>9. Chronology of events concerning USAID’s involvement with biological diversity</td>
<td>68</td>
</tr>
<tr>
<td>10. Summary of USAID biological diversity funding activities under the FY87 legislated earmark</td>
<td>83</td>
</tr>
<tr>
<td>11. Chronology of events leading to World Bank’s current environmental position</td>
<td>88</td>
</tr>
<tr>
<td>12. Declaration of environmental policies and procedures relating to economic development</td>
<td>92</td>
</tr>
<tr>
<td>13. Environmental interventions in World Bank’s project cycle</td>
<td>99</td>
</tr>
<tr>
<td>14. World Bank operational instruments for implementing environmental policies</td>
<td>103</td>
</tr>
<tr>
<td>15. Content analysis on 1983 International Environmental Protection Act and the 1986 Special Foreign Assistance Act</td>
<td>108</td>
</tr>
</tbody>
</table>
16. Content analysis of USAID Environment and Natural Resource Policy and the USAID cable to field missions concerning policy implementation 114

17. USAID biodiversity activities funded under FY 1987 legislated earmarked funds 116

18. Trends in USAID program funding from FY 1983 to FY 1989 118
APPENDICES

APPENDIX A - Content analysis procedure

APPENDIX B - Organizations and agencies contacted for this study

APPENDIX C - Nongovernmental environmental organizations concerned with biological diversity

APPENDIX D - 1983 Foreign Assistance Act Amendment. International environmental protection act

APPENDIX E - Special Foreign Assistance Act of 1986. Protecting tropical forests and biological diversity in developing countries

APPENDIX F - USAID’s criteria for reviewing biological diversity projects

APPENDIX G - 1985 Appropriations Bill, Sec. 540

APPENDIX H - U.S. Congressional draft recommendations regarding environmental concerns associated with multilateral development bank activities
Biological Diversity and Third World Development: A Study of the Transformation of an Ecological Concept into Natural Resource Policy

CHAPTER ONE

INTRODUCTION

During the past several years the concept of biological diversity has captured the attention of many people concerned with Third World economic development and environmental issues. This concern for biological diversity stems, in part, from the assumption that many plant and animal species are being exterminated as a result of habitat destruction through economic development activities such as land clearing for agricultural and resettlement schemes, road building, and dam construction. Though destruction of biodiversity is occurring in both developed as well as developing nations, many claim that the most extensive plant and animal extinctions are occurring in Third World nations.

Interest in biodiversity, however, can be viewed as but part of a larger concern for the relationship between Third World economic development and environmental protection. This relationship received world-wide attention at the U.N. Conference on the Human Environment held in Stockholm, Sweden in 1972.
(Caldwell 1985). At the Stockholm conference two conflicting views of the purpose of the conference were presented. One view, taken primarily by participants from the developed nations held that the conference should focus on the human impacts on the biophysical environment. The second view, put forth by Third World nation participants, was that though the environment was important, more important were the issues of social and economic development (Caldwell 1985).

Reconciliation of these views was made possible when an agreement was forged stating that a necessary element of social and economic development was protection of the environment (Caldwell 1985). Since this time, a number of environmental issues such as desertification, tropical deforestation, and drinking water supply and sanitation have captured international attention and resulted in concerted efforts by nations and international organizations to address these issues.

Thus the concern for biological diversity is but one of a series of concerns related to economic development activities in Third World nations, and particularly economic development activities funded by foreign aid donors such as the U.S. Agency for International Development (USAID) and the World Bank. As a result of this concern, foreign aid donors like
USAID and the World Bank have adopted strategies incorporating the conservation of biological diversity into agency policies.

Biological diversity, however, is not the first environmental issue that has found its way into economic development policies of bilateral and multilateral economic development agencies such as USAID and the World Bank. Over the past twenty years such issues as the role of environmental impact assessment in economic planning and the concern for tropical deforestation have also become part of developmental agency policies and programs. But unlike these other environmental issues, the incorporation of biodiversity concerns into existing economic development programs may be more difficult because the conservation of biological diversity relates to many seemingly unrelated issues such as habitat-species relationships, land use, international trade, agricultural development, and ethics.

These issues in turn raise a series of questions which should be resolved prior to incorporating biological diversity concerns into existing economic development policies and programs. These questions include: What is biodiversity? How important is biodiversity in development? Can the maintenance of biological diversity be assured? At what level should
biological diversity be maintained? and, How shall that level be determined?

**Problem Statement**

Though much has been written about biological diversity, few have addressed the questions above. Because these are normative questions involving the setting of generally accepted standards, their resolution involves public debate. As a starting point for such a debate, this study will focus on a more fundamental issue: how the concept of biological diversity evolved from scientific thinking into policies within the economic development programs of USAID and the World Bank. Because there is no definitive time-frame within which biodiversity may be placed, this study looks at the development of the biodiversity issue prior to 1988.

The process of how scientific concepts become the basis for natural resource policy is not unique to biological diversity. Indeed other resource issues, for example, such as old-growth forests, sustained-yield of timber resources, and wilderness, have also gone through a similar process. To help understand this process, and specifically how the concept of biological diversity was translated into natural
resource policy, the following conceptual model is proposed:

Process Model

Stage 1: Definition and Formulation of Concept. During this stage the concept is formalized and defined by the scientific community.

Stage 2: Adoption of Concept by Environmental Community. In the second stage of the process, the concept is adopted by advocacy groups, such as environmental organizations, whose staff formulate views and positions on the concept. These views and positions are presented by representatives of these groups to lawmakers with the idea of influencing policy related to the concept. However, the advocacy groups never fully rationalize their interpretation of the concept with that developed within the scientific community. That is, there are related ideas surrounding the scientific concept which are lost or selected-out by environmental groups which may be vital for a better understanding of the scientific concept. One result is that any uncertainty or ambiguity surrounding the scientific concept is never translated to lawmakers.

Stage 3: Legislative Phase. During this phase lawmakers listen to advocacy groups and develop legislation. Members of the scientific community may also appear before Congressional committees but do not always talk of the complexities of a scientific concept and often take an advocacy position themselves.

Stage 4: Policy Formulation and Implementation. Once the concept is translated into law, agencies become responsible for implementing legislation pertaining to the concept. The concept, which has been 'filtered' by advocacy groups as well as lawmakers, must now be integrated with social and political realities.
This study will use the above model as a framework of analysis while addressing the following objectives.

Objectives

1. To document scientific views of biological diversity and the rationale for the importance of biological diversity.

2. To document and examine nongovernmental environmental organization (NGEO) views of biodiversity.

3. To document and examine biodiversity concerns in the polices of the U.S. Agency for International Development (USAID) and the World Bank.

Methods

Scientific views of biodiversity were documented by examining scientific publications on the biological diversity issue. The search focused on the period from 1955 through 1988 and publications were found by searching the following indexes and abstracts: Science Citation Index, Biological Abstracts, Environmental Abstracts, and the General Science Citation Index.

According to the proposed model, advocacy groups adopt the scientific concept and present the issues to the lawmakers. For this study, the advocacy groups are Nongovernmental Environmental Organizations (NGEOs). For the purposes of this study, NGEOs are those
organizations whose sole purpose is to promote and support environmental programs and awareness. This study focuses on six NGEOs noted by lawmakers as playing a major role in helping to forge biodiversity legislation.

Documentation and analysis of NGEOs positions on biodiversity were done through content analysis (Appendix A) of NGEO personnel testimony presented during Congressional committee hearings on biological diversity held in 1985. This analysis shows that biodiversity ideas presented to lawmakers were filtered by NGEO staff resulting in a loss of, or reinterpretation, of some of the ideas concerning biodiversity formulated by the scientific community.

During the third and fourth stages of the policy process, legislation is developed and translated into policies implemented by government institutions. For biological diversity, two organizations with major responsibility for implementing biodiversity legislation are the U.S. Agency for International Development (USAID) and the World Bank.

Documentation and analysis of biodiversity concerns in the policies of USAID and the World Bank was done in three steps: The first step determined Congressional intent with respect to biological diversity. This was done through the development of
a history of the laws enacted by Congress requiring USAID and the World Bank to consider biological diversity in international development activities.

The legislative history pertaining to biological diversity was developed from a search of the **U.S. Code and Administrative News**, and the **U.S. Code**. The laws were analyzed in terms of whether lawmakers favored NGEo ideas on biodiversity or whether concerns raised by the scientific community were incorporated. This analysis was aimed at determining whether lawmakers filtered out some of the scientific concerns about the biodiversity concept or acknowledged the complexity of the issue.

In the second step, USAID and World Bank interpretations of Congressional intent as reflected in biodiversity policies were analyzed. This analysis was done through a review of USAID and World Bank policy statements, internal reports, and through testimony of USAID and World Bank officials given during Congressional hearings on the biological diversity issue. Agency policy statements and internal reports were obtained from USAID and World Bank staff who were contacted by mail (names and addresses in Appendix B). The contents of these policy statements were analyzed with respect to Congressional legislative intent and NGEo and scientific views on biodiversity.
The third step in documenting biodiversity concerns in the policies of USAID and the World Bank was to show how biodiversity policies have been operationalized. World Bank project papers were unavailable, but 21 USAID biodiversity projects were analyzed with respect to whether the projects reflect USAID policy as well as Congressional intent. Finally, the magnitude of biodiversity concerns are demonstrated by comparing the amount of money spent on biodiversity as a percentage of the total U.S. foreign aid budget for the fiscal years 1983 to 1987.
CHAPTER TWO

SCIENTIFIC VIEWS OF BIOLOGICAL DIVERSITY

Since the time of Aristotle, scientists have been interested in the diversity of life. Indeed, it may be argued that the study of diversity has been a major impetus in the development of biology (Mayr 1982). In general, scientific interest in biological diversity can be grouped into three broad, overlapping areas: (1) classification and description; (2) diversity pattern recognition and explanation; and (3) conservation (figure 1).

Classification and Description

Classification and description of organisms developed as an interest in studying diversity because of curiosity as well as to gain knowledge of the utilitarian aspects of plants and animals. In addition, early scientists were interested in studying diversity because of the desire to better understand the order and harmony of nature which, ultimately, proved the existence of God (Mayr 1982).

Early classification schemes grouped organisms into broad categories and in alphabetical order. The earliest classification scheme dates back to Aristotle (388-322 B.C.) who placed organisms in large groups
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<tbody>
<tr>
<td>Aristotle</td>
<td>Theophrastus</td>
<td>Dioscorides</td>
<td>Ray</td>
<td>Linnaeus</td>
<td>Voyages of Discovery</td>
<td>Elton</td>
<td>Hutchinson</td>
<td>Foodwebs and Diversity</td>
<td>Nutrient Cycling and Diversity</td>
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<td>Preston</td>
<td>Explanation of Species Relationship</td>
<td>Energy Paths and Diversity</td>
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<td>MacArthur</td>
<td>Species living together</td>
<td>Diversity and Stability</td>
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Figure 1. Time frame of scientific interest in biodiversity as discussed in text.
based upon the shapes of body and body parts. Within the groups other differentiating characteristics were used based upon the four primary elements of fire, water, earth, and air. Though Aristotle focused mainly on animals, others such as Theophrastus (371-287 B.C.) and Dioscorides (ca. 60 A.D.) developed comparable plant classification schemes. Eventually these early classification schemes became cumbersome and there evolved a more systematic method of classification based on the work of such scientists as John Ray and Carl Linnaeus. Ray, for example, developed a plant classification scheme based on form and gross morphology. Linnaeus developed even further the science with his 'sexual system' of classification. Linnaeus organized plants into classes based on the number and length of flower stamens. The classes, in turn, were further subdivided into orders based upon the number of styles in the flower (Lawrence 1951).

Other events which spurred the development of classification and description were the 18th and 19th Century voyages of discovery of such people as James Cook, Alexander von Humboldt, Charles Darwin, and Alfred Wallace. These voyages were significant because they brought back to Europe a wealth of species never before seen by European scientists. As an example of the amount of material collected on such a voyage,
Humboldt, from his explorations in South America, brought back to Europe over 60,000 plants (James 1981). Classification and description activities, however, were eventually held in low esteem by many biological scientists and there was a drastic decline in taxonomic and systematic studies. A number of factors accounted for this decline.

One factor was simply the growth of interests in other fields of biology such as physiology, embryology, and pathology. In addition, scientists began to question the validity of classification when such activity did not lead to the development of scientific theory and laws. Finally, scientists began to realize that the natural world was more complex than a simple listing and describing organisms. Scientists were coming to grips with the idea that not only were organisms themselves important, but equally so were the relationships between organisms and between the organisms and their physical environment (Mayr 1982).

Ironically the lack of interest in classification has contributed to current problems in tropical ecology and the study of biological diversity. Both Mayr (1974) and Wilson (1985), for example, point to the lack of interest in taxonomic studies as one reason why tropical species are not well catalogued and described.
Diversity Pattern Recognition and Explanation

Though the interest in classification diminished, comparison of species lists in different habitats led scientists to an interest in measuring and explaining diversity patterns. Elton (1930), for example, studied the importance of the diversity of size of species found in foodwebs. His research showed that smaller, prey organisms were more numerous than larger predator organisms which led to further predator-prey studies showing that diversity increased as species subdivided their environment (Janzen et al. 1976).

On the other hand, Hutchinson (1941) showed that in lake environments, the number and size of organisms was not only a function of species partitioning of the organic environment, but also of the size, depth, water temperature and other inorganic parameters of lakes.

Hutchinson's (1957) further investigations concerning how species divide resources and live together led to his development of the niche theory. Hutchinson suggested that a 'niche' is a species' place in a community in relation to other species. Since no two species can occupy the same niche, there is a tendency for a community to become more diverse as
species evolve to reduce competition and adapt to and inhabit different niches.

In 1959, Hutchinson published a paper which some consider a turning point in the study of biological diversity. Brown (1981:877), for example, said that Hutchinson's paper "focused attention on problems of species diversity and community organization that have occupied many .... ecologists for the last two decades."

In this seminal work, Hutchinson considered the question of "why there are so many kinds of organisms" and suggested avenues of research to answer this question. Hutchinson's basic tenet is that in order to understand the diversity of organisms, one must understand the uses and pathways of energy flows in ecosystems.

The energy flow theme has been the focus of many studies, most notable those by Odum (1969). Odum's approach has been to study whole ecosystems and emphasize interactions between organisms and the physical environment treating the ecosystem as a "complete holistic system" (Brown 1961:879). Based upon this approach, Odum concluded that the more diverse the foodwebs in a system, the more energy paths available for organisms, resulting in greater ecosystem diversity.
One of the most prolific and influential scientists studying biodiversity patterns was Robert MacArthur. MacArthur was instrumental in developing models to explain diversity patterns and relationships between species. In 1965, MacArthur adapted concepts from information theory to develop measures of species diversity and explain relationships among species. According to MacArthur, the application of information theory can be used to compare species pattern changes with environmental changes (MacArthur 1965:531).

MacArthur also conducted research on how species allocate resources within ecosystems and live compatibly with each other (1957, 1958). These studies led to the consideration of factors affecting changes in diversity and in 1963, MacArthur and Wilson published a theory on island biogeography. Simply stated, this theory held that the two factors which influenced the number of species on an island were the rates of immigration and extinction. At some equilibrium point, the rate of immigration and extinction must balance, leading to an equilibrium number of species.

MacArthur also developed one of the most widely used models to explain species relationships called the "broken-stick" model. In this model the abundance of species is determined by the species ability to compete
for resources distributed along some continuum. The continuum is randomly broken into segments representing the species place in a community in relation to other species. The length of the segments are proportional to the relative abundance of each species (Ricklefs 1973; Whittaker 1970; MacArthur 1957).

Another widely used model of explanation was introduced by Preston (1948) and developed further by Whittaker (1965), May (1975), and Sugihara (1981). In this model, called the 'truncated normal curve,' the number of species is plotted as a function of the number of individuals per species.

In addition to identifying and modeling of diversity patterns, scientists were also interested in understanding the significance of biodiversity. One of the most often cited is the relationship between biological diversity and stability. The concept of stability, however, is as complex as that of diversity. Pimm (1986) states that there are at least four definitions of stability found in the literature (Table 1).

Preston (1969), for example, talks about two types of stability: constancy of species and physiographic. By physiographic stability, Preston means the constancy of climate, landforms, and other elements of the physical environment. Preston argues that without
physiographic stability, habitats would be in flux and no plants or animals could adapt themselves for long periods of time. Similarly, Margalef (1968) refers to the increasing constancy of species numbers of a system through time which he calls stability. He also writes about stability as the ability of a system to "remain reasonably similar to itself" despite changes in population due to environmental changes such as climate fluctuations or fire.

Table 1

Various definitions of stability

<table>
<thead>
<tr>
<th>Resilience</th>
<th>How fast the variables return to equilibrium following a perturbation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence</td>
<td>The time a variable lasts before it is changed to a new value.</td>
</tr>
<tr>
<td>Resistance</td>
<td>The degree to which a system is changed by a perturbation is the reciprocal of resistance.</td>
</tr>
<tr>
<td>Variability</td>
<td>The variance of population density.</td>
</tr>
</tbody>
</table>

(Source: Primm 1986)
If stability and diversity are related, in the sense that the greater the diversity of an ecosystem, the more stable it is, then ecosystem diversity could possibly be enhanced if Third World development planners design development activities which have minimal environmental impact. But the concept of biological diversity and stability, which scientists themselves have yet to agree upon, can hardly be a guiding force in Third World economic planning. The primary reason is that the complexity of the issue is beyond the expertise of most policy makers and planners. For example, how can the stability of an ecosystem be maintained if that stability is dependent upon a migratory species? And what if the migrant species happens to be a major food source or economic benefit to people in the migrants' disjunct habitat?

Conservation of Biodiversity

Even more problematic is the third and most recent area of scientific concern with biological diversity, the conservation of biological diversity. By the time conservation of biodiversity became of interest, definitions of diversity had evolved from interests in classification and description to include diversity pattern research and explanation. But once again, scientists do not uniformly agree as to these
definitions. Indeed some scientists feel that biodiversity conveys no useful information (Hulbert 1975) while others have suggested eliminating the term from scientific vocabularies altogether (MacArthur 1972). More recently Kolasa and Biesiadka (1984) concurred by writing that biological diversity has no formal definition.

Although no common agreement has evolved, three broad themes in the study of biological diversity persist (OTA 1987; Patrick 1983; Josephson 1982; Norse 1987):

1. ECOSYSTEM DIVERSITY: The variety of ecosystems that occur within a large landscape.

2. SPECIES DIVERSITY: The number and variety of species found in a given area in a region.

3. GENETIC DIVERSITY: The variety of genes within a particular species, variety, or breed.

Definitions of biological diversity are important for a number of reasons. In discussions of conservation of diversity, it is not always clear whether scientists are talking about species conservation, habitat conservation, or genetic conservation. This has an impact on the choice of strategies for diversity preservation and the consequences for Third World countries seeking to
preserve it. Also, the relative value of various diversities could present other problems for economic development planners. How is biological diversity to be maintained in areas planned for agricultural development or for resettlement where habitat must be altered? Is it to be presumed that diversity in all places and of all types is of equal importance?

In discussing the conservation of biological diversity, scientists are concerned with the following issues: What is the extent of diversity? What are the causes of diversity loss? Why should diversity be preserved? Where are the major areas of concern? Finally, how should biological diversity be preserved? As with the concept of diversity itself, the answers to these issues are varied.

The major focus of biodiversity conservation is on the tropical forest biomes (figure 2) which scientists agree contain the greatest number of species. Figure 3, for example, gives an indication of the average number of woody plant species found in a .1 hectare sample taken at different latitudes. Similarly, figure 4 shows the number of breeding land birds found in a range of latitudes in North and South America. Though scientists are not sure of how many species there are within tropical forest regions, knowing the
Figure 2. Generalized distribution of the tropical rainforests

Adapted from Richards, 1951
Figure 3. Average number of woody plant species found in a .1 hectare plot at different latitudes.

(source: adapted from Mooney: 1989)

Figure 4. Number of breeding land bird species found at different latitudes.

(source: adapted from MacArthur: 1972)
number of species is necessary in order to estimate the rate of species extinction.

A figure that is widely cited in the literature is that the world contains about five million species (Wilson 1988; Meyers 1986; WRI and IIED 1986). Table 2, however, shows that scientists have varying opinions as to the number of species in the tropics, let alone the world. For example, from insect sampling in tropical forest canopies, Erwin (1983) estimates that the world contains at least 30 million species of insects alone. On the other hand, Raven (1985), estimates at least 750,000 species are found in each of the major tropical forest regions (i.e., Latin America, Asia, Africa). Since the figures cited for extinction rates are based on the numbers of species in the world, extinction rate figures themselves are subject to debate.

The loss of tropical forest species is the result of both direct and indirect depletion of tropical forests with indirect depletion through habitat destruction being more significant (Myers 1986; Ehrlich 1988; Ehrlich and Ehrlich 1981). Forest habitat loss is the consequence of many activities (Table 3) but all, to some extent, involve clearing of forests. Once again scientists give an array of figures as to the extent and rate of tropical forest depletion (Table 4). Of the indirect depletion processes, Myers states that
Table 2

Estimates of total number of all species found in tropical forest ecosystems

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>.33 million</td>
<td>Myers, 1983</td>
</tr>
<tr>
<td></td>
<td>.75 million</td>
<td>Raven, 1985</td>
</tr>
<tr>
<td>Asia</td>
<td>.75 million</td>
<td>Myers, 1983</td>
</tr>
<tr>
<td></td>
<td>.75 million</td>
<td>Raven, 1985</td>
</tr>
<tr>
<td>Latin America</td>
<td>1.0 million</td>
<td>Myers, 1983</td>
</tr>
<tr>
<td></td>
<td>.75 million</td>
<td>Raven, 1985</td>
</tr>
<tr>
<td>World</td>
<td>5.0 million</td>
<td>Myers, 1986</td>
</tr>
<tr>
<td></td>
<td>30.0 million insect species</td>
<td>Erwin, 1983</td>
</tr>
</tbody>
</table>
Table 3

Causes of species loss

Direct Depletion
Exploitation of species

Indirect Depletion
Habitat loss
  Shifting agriculturalists
  Cattle ranching
  Logging
  Resettlement programs
  Agricultural expansion
  Urbanization
  Fuelwood gathering

Source: Meyers 1986

the most extensive habitat destruction is caused by shifting agriculturalists. Myers makes a distinction between shifting agriculturalists and what he calls "shifted cultivators" (Myers 1986:692). Shifted cultivators are landless people who do not have a good knowledge of the tropical forest environment and do not practice sustainable shifting agriculture. Other factors of forest depletion and species loss are commercial logging, cattle ranching, and fuelwood gathering.

Scientists also point out that a driving force behind many of these factors is "first-world consumerism" (Myers 1986; Ehrlich and Ehrlich 1981). As an example, Myers cites the 'hamburger connection' scenario where land is cleared to raise cattle whose
Table 4

Estimate of projected annual deforestation rates

<table>
<thead>
<tr>
<th>Region</th>
<th>Annual Rate of Loss</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>.44%</td>
<td>Lovejoy, 1980</td>
</tr>
<tr>
<td></td>
<td>.61%</td>
<td>FAO/UNEP, 1981</td>
</tr>
<tr>
<td>Asia</td>
<td>.6%</td>
<td>FAO/UNEP, 1981</td>
</tr>
<tr>
<td></td>
<td>.75%</td>
<td>Lovejoy, 1980</td>
</tr>
<tr>
<td>Latin America</td>
<td>.6%</td>
<td>FAO/UNEP, 1981</td>
</tr>
<tr>
<td></td>
<td>.85%</td>
<td>Lovejoy, 1980</td>
</tr>
<tr>
<td>All Tropical forests</td>
<td>1.0%</td>
<td>FAO/UNEP, 1982; Melillo, 1985; Myers, 1980</td>
</tr>
</tbody>
</table>
meat is sent primarily to the U.S. and to be used as hamburgers in fast-food restaurants. Though not cited by Myers, other examples include the clearing of land to grow estate crops such as coffee, bananas, tea, and spices, all of which are sold to the developed nations.

Species extinction rates are extrapolations of species loss based upon destruction of tropical forests. There is no direct evidence of species loss from deforestation, but because tropical forests are being destroyed, scientists believe that species are also being lost. Based upon deforestation rates, scientists have made an array of estimates for potential species loss and Table 5 is a compilation of some of these estimates. It is clear that scientists are once again not in agreement concerning an important aspect of biological diversity. Such lack of agreement can present a problem because as one scientist notes, "a loss of scientific credibility can seriously hamper continuous efforts to develop lasting popular support for the conservation of ecological diversity (Lugo 1988:58).

Others question these extinction rates primarily because of the weak data base and the fact that species extinction rates are based upon tropical rainforest destruction rates; rates which themselves are questionable. Similarly, Simberloff (1986) states that
## Table 5

**Estimate of potential extinction rates of species in the tropics**

<table>
<thead>
<tr>
<th>Rate of loss</th>
<th>Time frame</th>
<th>Basis of estimates</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% of all species</td>
<td>by mid-1980's</td>
<td>Unknown</td>
<td>Myers, 1970</td>
</tr>
<tr>
<td>1 species/day</td>
<td>1970</td>
<td>Unknown</td>
<td>Myers, 1970</td>
</tr>
<tr>
<td>33-50% of all species</td>
<td>1970-2000</td>
<td>Relationship between percentage of forest lost and percentage of species lost.</td>
<td>Lovejoy, 1980</td>
</tr>
<tr>
<td>1 million +</td>
<td>by end of century</td>
<td>If present land-use continues.</td>
<td>National Research Council, 1980</td>
</tr>
<tr>
<td>50% of all species</td>
<td>by 2000</td>
<td>Different assumptions based on different exponential functions of tropical deforestation.</td>
<td>Ehrlich &amp; Ehrlich, 1981</td>
</tr>
<tr>
<td>Several hundred thousand species</td>
<td>in a few decades</td>
<td>Unknown</td>
<td>Myers, 1982</td>
</tr>
<tr>
<td>25-30% of all species</td>
<td>by 2000</td>
<td>Unknown</td>
<td>Myers, 1983</td>
</tr>
<tr>
<td>500,000-600,000 of all species</td>
<td>by end of century</td>
<td>Unknown</td>
<td>Oldfield, 1984</td>
</tr>
<tr>
<td>.75 million of all species</td>
<td>by 2000</td>
<td>Present rate of tropical deforestation.</td>
<td>WRI &amp; IIED, 1986</td>
</tr>
<tr>
<td>33% of all species</td>
<td>by 2000</td>
<td>Present rate of tropical deforestation.</td>
<td>Simberloff, 1983</td>
</tr>
<tr>
<td>20-25% of all species</td>
<td>by 2250</td>
<td>Present rate of tropical deforestation.</td>
<td>Norton, 1986</td>
</tr>
<tr>
<td>15% of all plant species and 2% of all plant families</td>
<td>by 2000</td>
<td>Present rate of tropical deforestation rates</td>
<td>Simberloff, 1986</td>
</tr>
</tbody>
</table>

Source: adapted from Lugo 1988:59
he knows of no existing data which unquestionably prove that a species has become extinct in the New World tropics. Another conservation tactic being used is to claim that since no data can be cited as to which species have become or are becoming extinct, scientists should focus on species that we do not yet know about (Lovejoy 1976). But as McPhearson (1986) points out, this isn’t even logical for how do we know we’ve lost something if we never knew we had it to begin with?

Reasons for preserving biodiversity pertain to all three levels of diversity, but most attention has been given to species and habitat protection. Rationale for preserving diversity fall into four areas: (1) compassion (i.e., other species have a right to exist); (2) esthetics; (3) economic (species provide direct benefit to humans and, in some instances, unknown species may hold the potential for future benefits); and (4) ecosystem services (indispensable services to humans which are not necessarily economic such as atmospheric gas exchange, regulation of world’s freshwater supply, etc.).

However in a world where economic considerations are the primary decision criteria, most of the above arguments do not hold much weight. As Norton (1988) points out, even though compassion and ethical reasons for preserving biological diversity may someday become
paramount, conservation arguments must be couched in terms of "the well-being of individual human beings." Besides the ethical/economic dilemma, another consideration should also be given to exactly which ecosystems and species should be preserved. Even though certain ecosystems are more diverse than others, some argue that it does not make sense that any one species or ecosystem can be considered more valuable than another. Each ecosystem has its own characteristic diversity and we should focus on this aspect (Ray 1988).

The final issue, that of how to preserve biological diversity, is the one with the most potential impact on Third World economic development. If we compare figure 2 with figure 5, we see that many of the countries which contain tropical forests are also countries which are classified as low- or middle-income and receive large amounts of foreign aid (World Bank 1989). Thus given the limited amounts of foreign aid money available to any one country, any biological diversity conservation schemes should be in concert with social and economic development schemes. As one author notes, why should developing nations preserve biological diversity at the expense of economic development? (Kellert 1986).
Unfortunately, very few suggestions encompass a rationale for developing countries to preserve diversity along with concrete suggestions of how conservation and development can proceed to the benefit of both. Most of the suggestions as to how to preserve biological diversity center around creation and maintenance of parks and maintenance of 'minimum viable populations' within those parks (Gilpin and Soule 1986). To be sure there are exceptions.

Gilbert (1980), for example, feels that developing and managing tropical reserves involves complex biological, social, economic, and political issues and suggests that conservation schemes should address two questions: (1) What agricultural systems are compatible with nature preserves? and, (2) what benefits do adjacent agroecosystems derive from nature reserves? Another exception is the work of Daniel Janzen in Costa Rica who is restoring a dry tropical forest ecosystem and integrating the needs of local people within a national park (Cairns 1988; Janzen 1988a, 1988b).

Though many scientists promote the establishment of preserves, the same scientists realize the problems inherent in such a plan. For example, Paul Ehrlich feels that the "basic tactics of conservation are...[to]...establish numerous, large, well-sited
Figure 5. Low- and middle-income economies

Source: World Bank, 1989
appropriately" (Ehrlich and Ehrlich 1981:242). preserves all over the globe, and manage them

On the other hand, Ehrlich also feels that setting aside preserves is no longer enough to preserve biological diversity. For one thing, suitable areas are not prevalent; for another, they are difficult to protect (Ehrlich 1988). Ehrlich feels that even though technology can, to some extent, help diminish the decline of biological diversity, what is really needed is a complete change in people's attitudes.

Ultimately, in order to conserve diversity in the Third World nations, there needs to occur a fundamental change in the "world trade system", in rich-poor nation relations, and a movement away from the 'trickle down' theory of economic development (Ehrlich and Ehrlich 1981). These views are echoed by other scientists such as Myers who feel that stemming species destruction must be a mixture of technological, social, political, and economic solutions (Myers 1986).

One result of the need to better understand the extinction process and develop strategies for preserving biological diversity has been the development of a new subdiscipline within biology called 'conservation biology.' According to one of its founders, the goal of conservation biology is to
"provide principles and tools for preserving biological diversity" (Soule 1985).

Soule identifies three levels of complexity and problems with which conservation biology deals: (1) POPULATION: the major question dealt with at this level is, how can the length of time that a population will persist be predicted?; (2) COMMUNITY: questions of concern at this level are, what is community equilibrium? Does equilibrium exist more in one biome than in others?; and (3) ECOSYSTEM: this level deals with the broader issues such as the consequences of damming rivers and impacts of acid rain.

Discussion

During the first stage of the Process Model, the scientific concept is formulated and defined by the scientific community. As seen in this chapter, the scientific concept of biodiversity has encompassed three broad areas, as defined by the scientific community: classification and description, diversity pattern recognition and explanation, and conservation.

In turn, these areas of interest have led to the development of three broad themes of biodiversity consisting of ecosystem, species, and genetic. Figure 6 reflects this to some extent. The figure was generated through a title search of biodiversity
<table>
<thead>
<tr>
<th>Biodiversity theme</th>
<th>Percent of articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystem</td>
<td>18</td>
</tr>
<tr>
<td>Species</td>
<td>47</td>
</tr>
<tr>
<td>Genetic</td>
<td>13</td>
</tr>
<tr>
<td>Unable to determine</td>
<td>22</td>
</tr>
</tbody>
</table>

Figure 6. Cumulative tabulation of biodiversity articles cited in the General Science Index: 1970 - 1989
articles listed in the General Science Index for the 1970 - 1989 period. Only articles in 7 'high-impact' journals were tabulated. High-impact journals are those which receive higher manuscript submissions and are cited more than other journals and are considered to have the greatest impact on a particular discipline (Abrahamson, W.G, et al. 1989; Garfield 1970; Price 1965). The 7 'high-impact' journals are: American Midland Naturalist, American Naturalist, Ecology, Evolution, Journal of Ecology, Nature, and Science.

Another aspect of the process is that even after environmental organizations adopt the concept, the scientific community continues to define and formulate the concept. This is reflected to some extent by comparing figure 6 and figure 7. Figure 7 is an accumulation of articles related to biodiversity taken from 3 environmental magazines. These magazines are: Nature Conservancy News, Sierra Club Bulletin, and Wilderness.

Though it cannot be determined exactly when biodiversity was adopted by the NGEO community, it may be safe to say that at least by 1983 a good many NGEOs began to address the biodiversity issue. It is clear from Figure 6 that the scientific community continued to address the biodiversity issue after 1983.
Figure 7. Cumulative tabulation of biodiversity articles published in 3 environmental magazines
Though all scientific areas of interest in biological diversity have some relation to Third World economic planning, the area of conservation impinges upon the planning process the most. In general, scientists have not made any concrete suggestions for integrating the conservation of biological diversity with Third World economic development schemes. Indeed, some authors make the point that no compelling arguments have been made to preserve diversity and to make Third World nations consider conservation of paramount importance (McPhearson 1986).

Scientists have, however, been instrumental in making the concept of biological diversity a concern for Third World economic planners. Though their role has not been the setting forth of concrete proposals, they have attempted to clarify the issues for policy-makers, environmental organizations, and the general public. But, since the concept of biological diversity is not readily agreed upon by scientists, nor the reasons and methods for conserving diversity, it is very difficult for policy-makers to establish unambiguous guidelines for the protection and conservation of biodiversity.

It is not just scientists who are making a case for the conservation of diversity. Very strong proponents for conservation are nongovernmental
environmental organizations. Officials of these organizations also define the biological diversity issue and are, in the main, the strongest advocates of making biological diversity a Third World natural resource and economic issue.
CHAPTER THREE

NONGOVERNMENTAL ENVIRONMENTAL ORGANIZATIONS AND BIOLOGICAL DIVERSITY

Nongovernmental environmental organizations (NGEOS) have played a major role in making the concept of biological diversity a Third World issue in several ways. They have heightened public awareness through writings in public literature, developed and promoted plans for conserving biodiversity, thus elevating the problems of diversity loss to the attention of government and multinational banks, and by working with government officials and presenting Congressional testimony to initiate and influence legislation which deals with conservation of biological diversity. Most notable for this study has been their role in fostering changes in the policies of the U.S. Agency for International Development.

The views and programs of the NGEOs discussed in this study do not encompass the full range of nongovernmental environmental organizations involved in conserving biological diversity. Appendix C is a list of those NGEOs that have some interest in conserving biological diversity. Appendix B are those NGEOs (and other organizations) along with their addresses and people contacted, who, for the purposes of this study,
played the biggest role in transforming the biodiversity concept into natural resource policy.

NGEOs included in this study were chosen based upon one of the following criteria: (1) Those NGEOs which provided testimony to the Congressional committee hearings on biodiversity; (2) those NGEOs which published position papers or research papers on biodiversity; and (3) opinion of USAID and World Bank personnel (see Appendix B) as to which NGEOs they felt were most influential in helping establish biodiversity policy.

NGEOs are of two types. First are those organizations which are mainly 'think-tanks,' whose products are such things as research papers, topic analysis, and position papers. The NGEOs in this category are the Worldwatch Institute, the World Resources Institute, the Center for Development and Environment (formerly called the International Institute for Environment and Development and now a center within the World Resources Institute), and the International Union for the Conservation of Nature. The second category of NGEOs are those whose major focus is on field-oriented projects. Organizations in this group are the World Wildlife Fund, and the Nature Conservancy. NGEOs have played a major role in biological diversity policy formulation by influencing
lawmakers and they have joined forces in producing and implementing plans of their own.

Worldwatch Institute

The Worldwatch Institute (WWI) is a nonprofit research organization started in 1974. WWI does not claim to do original research or offer solutions on natural resource issues. The major focus of WWI is to identify and analyze emerging global problems and trends and bring them to the attention of opinion leaders and the general public.

Under the auspices of WWI, a number of publications have been produced dealing with the conservation of biological diversity. Two of these publications often cited by others writers on the diversity topic are "On the brink of extinction," by Edward C. Wolf (1987) and "Disappearing species: The social challenge," by Erik Eckholm (1978). Both of these publications delineate the issues surrounding the loss and preservation of biological diversity and contain extensive references. Another document published by WWI is called the "State of the World," issued annually, which discusses those environmental issues deemed important by WWI. The "State of the World 1986" and "State of the World 1988" publications both contain sections on biological diversity.
Though WWI has tried to bring the plight of biological diversity to the attention of the world and its leaders, WWI president Lester Brown feels that the efforts to conserve biological diversity are being made by only "a handful of concerned scientists and environmentalists" (Brown 1988). Brown cites several things needed to change this situation.

One is better information on species extinction since no one can say with any precision just exactly how many species are being lost. It is too easy, according to Brown, to dismiss 'doomsayers' predictions. Also, the biological diversity issue must be internationalized. This can be done through an international conference similar to those sponsored by the United Nations. Though nothing substantial may be accomplished, the purpose of such a conference is to educate bureaucrats. It also forces nations to analyze their positions with respect to conservation of biological diversity since they would publicly present their nations' positions on this subject. Finally, there is a need to increase the public's awareness of the plight of biological diversity. For example, an international conference would help to heighten public awareness on the biological diversity issue. More importantly, this awareness could translate into public pressure on governments to act.
World Resources Institute

The World Resources Institute (WRI) is a policy research center established in 1982. The purpose of the WRI is to study environmental, energy, and resource issues that are global in scope and implications. Areas of focus include tropical deforestation, preservation of biological diversity, desertification, and acid rain. Some of their programs include, "The Global Possible," focusing on what mechanisms, programs and institutions are most likely to ensure a "brighter future" (Lanouette 1984), "Private Sector Initiatives," looking at what role multinational corporations can play in helping developing countries with ecologically-sound development, and, in 1985, publication of "Tropical Forests: A Call for Action" (TFCA).

The TFCA was written by WRI in cooperation with the World Bank and the United Nations Development Program. The Plan was written in response to the view that tropical deforestation is a hindrance to sustained economic development in many developing countries. The TFCA recommends that $8 billion be spent over a five-year period (1987-1991) in the areas of fuelwood, social forestry, conservation, and institution building.
The conservation of biological diversity is covered in the section on conservation of tropical forest ecosystems. Tropical forests are seen as containing great biological wealth which is necessary for sustained economic development as well as providing nontimber products which support indigenous peoples. According to the Plan, tropical forests can only be saved if "human pressures on them are reduced" (WRI 1985:37). In order to do this, the Plan recommends several actions:

- Reduce pressures on tropical forests by intensifying agriculture on nonforest land; establish agroforestry systems and establish plantations on degraded land;
- Expand the global system of conservation areas in tropical countries. These areas should be a mix of national parks and areas that are multiple-use zones;
- Find and protect centers of high biological diversity. These include areas of origin of wild crops and areas of tropical rainforest which are in immediate danger of destruction.
- Minimize and eliminate damage to already existing national parks in developing countries;
- Develop national conservation plans for each country;
- Develop conservation data centers.

Though the task of implementing the TFCA is formidable, progress has been made. For example, developmental agencies now coordinate loans in
forestry, national forest plans are being prepared in a
dozen countries, and the World Bank, U.S. Agency for
International Development, and Canadian International
Development Agency all have significant programs in
tropical forest conservation (Burley 1988).

But others feel that the scale of the response is
too small. For example, over the past 25 years, WWF
has spent only $10 million on conservation projects.
In addition, legislation passed by the U.S. Congress in
1986 designates less than $10 million a year for
conservation projects outside the U.S. To put this in
perspective, the TFCA recommended that over $800
million was needed for the 1987-1991 period. Beyond
this, others have criticized the TFCA on other grounds.

According to one critic, the dominant view of the
TFCA plan is that economic returns are more important
than social and long-term ecological considerations
(Renner 1987). The real cause of tropical
deforestation and consequent biological diversity loss
is not the poor, as the TFCA plan states, but the
actions of transnational corporations, national
governments and development projects funded by
development agencies.

Finally, the TFCA plan is criticized for the fact
that no ecologists or conservationists from
nongovernment-funded organizations were on the TFCA
committee, nor were there any representatives from indigenous peoples directly impacted by tropical deforestation (The Ecologist 1987).

**International Union for the Conservation of Nature**

The International Union for the Conservation of Nature (IUCN) was founded in 1948 for the purpose of promoting economic development while ensuring the conservation of nature. As a past president of the organization has said, IUCN "aspires to make conservation a tool for development" (Budowski 1972:24). The organization has 542 voting members in 115 countries and maintains a global network of more than 20,000 scientists and other professionals (National Wildlife Federation 1988). From its inception, the IUCN has been concerned with the conservation of biological diversity. For example, it publishes the "Red Data Books" which are standard references on endangered species. In 1962, the IUCN was assigned by the United Nations to keep the UN list on National Parks and Protected areas. In addition, the IUCN Species Survival Commission and Commission on National Parks and Protected Areas are recognized throughout the world as the leading sources of expertise on species and protected habitats.
IUCN's views on biological diversity are best seen in two documents which deal with conservation and development in general. The first of these, called the World Conservation Strategy (WCS), was published in 1980. The Strategy was commissioned by the UNEP which, together with the World Wildlife Fund (see below), provided financial support and technical advice in developing the basic themes of the Strategy.

The objectives of the WCS are to: 1) explain the contribution of living resource conservation to human survival and sustainable development; 2) identify the priority conservation issues and the main requirements for dealing with them; and 3) propose effective ways for achieving the Strategy (IUCN 1980).

One of the philosophical tenants of the Strategy is that economic development entails environmental modifications. However not all modifications lead to the desired goals of development and, quite often, results in irrevocable destruction of some habitats. Since development is inevitable and desirable, it is therefore necessary that development be based on the principles of conservation (Allen 1980).

The Strategy focuses on the conservation of tropical rainforests since they are the centers of the greatest genetic diversity. Within the tropical forest biome, the Strategy sets forth five priorities for
preserving genetic diversity. These are: 1) emphasizing species which are endangered throughout their range and those that are sole representatives of their families; 2) preserving as many economically important varieties of crops and forage plants, and livestock animals; 3) on-site protection of species and their habitats; 4) inventory protected areas and ensure the area is large enough to achieve conservation goals; and 5) coordinate national protected area programs with international ones (IUCN 1980).

According to the Strategy, the only way that conservation of biodiversity can be achieved is by integrating economic development and conservation. The WCS outlines ways to do this such as coordination of development activities across sectoral lines, establishing "anticipatory environmental policies," and developing conservation performance standards for businesses and making them accountable for those standards (IUCN 1980 Sec.9:2).

The second IUCN document which sets forth their views on biological diversity is called "From Strategy to Action" (IUCN 1988). This document was produced as a response to the World Commission of Environment and Development (WCED) report called "Our Common Future" which proposed strategies for long-term sustainable development and recommended ways for better
international cooperation on problems related to environment and economic development. In short, "Our Common Future" states that sustained economic development is dependent upon a sustained environmental base. Too often, however, development proceeds without considering environmental consequences and often ends in economic and ecological disaster. Programs are needed which consider environmental consequences while addressing other contributors to environmental degradation and slow economic development. Some of these contributing factors include population growth, lack of sustainable economic and land-use activities and inflexible institutions which do not consider individual, regional or national needs (IUCN 1988).

"From Strategy to Action" is IUCN's view of the issues identified in the WCED report and suggests ways to implement WCED recommendations. The Strategy covers a wide range of conservation issues, one of which is the conservation of biological diversity. According to the Strategy, conserving biodiversity is important because "species are the building blocks of ecosystems" and "ecosystems provide life support systems for humans (IUCN 1988:29). The Strategy cites problems affecting the conservation of biological diversity which include, ignorance of complex tropical ecosystems and the role they play in providing
ecosystem services, tropical forests and lands exploited for short-term profits, and economic development objectives which undervalue ecosystems and their biological diversity.

The Strategy suggests a two-pronged approach to "break the siege on biological diversity" (IUCN 1988:30). The first approach is to raise public and governmental awareness as to the importance of biological diversity for acquiring basic human needs. The second approach is to develop a better understanding of how biodiversity contributes to sustainable economic development.

Though the IUCN plans make valuable suggestions as to the need to conserve biological diversity, none of the plans gives a strong reason as to the importance of biological diversity for economic development. In the IUCN plans, biodiversity is still treated as some abstract ecosystem property that people intuitively know is important, but for some reason cannot make an objective case for that importance and, ultimately, the need to conserve biodiversity. It appears there is a stronger emotional than scientific tie to the need to conserve plants and animals. Indeed, one of the suggestions made in the IUCN Strategy is to increase the "emotional relationship between people and nature" in order to foster support for conservation programs.
But the fundamental issues of why biological diversity is being destroyed, for example, landlessness, hunger, and population pressures, are not directly addressed in the Strategy.

World Wildlife Fund

The World Wildlife Fund (WWF) was founded in 1961 and within 20 years reached a membership of 130,000. By 1985 the WWF provided over $90 million to support 4,000 scientific research, education, wildlife, and habitat programs in 130 countries. The WWF is the largest single American source of international conservation grants (Kremer 1985, National Wildlife Federation 1988).

The major objective of the WWF is to protect the full range of biological resources within natural ecosystems. WWF offers hands-on, solution-oriented conservation projects which focus on species and habitat protection, sustainable development and local community involvement (Kremer 1985). Although WWF avoids partisan political involvement, WWF-US is active in public policy-making and maintains a full-time staff and legal counsel to represent its views before legislators and decision makers. In order to expand its expertise and political clout, the WWF entered formal affiliation with the Conservation Foundation in
1985. According to Russell Train, Chairman of the Board for both organizations, saving endangered species through establishment of parks and protected areas is no longer enough. Also needed are "the kind of specialists in water resources, urban planning, land economics, pollution control, and conflict resolution that make up the Conservation Foundation" (Brown 1986).

Early WWF efforts focused on conserving individual species, but since 1985-1986, the emphasis has shifted to conservation of habitats, developing national conservation plans and conservation education. In addition, the bulk of WWF's programs (60 cents out of every dollar) go to the Latin American and Caribbean Region (Reilly 1986). In the Latin American and Caribbean Region (LAC) region, WWF stresses two areas. One is conservation and development where the need is to offer alternatives for acquiring basic human needs which do not endanger the living natural resource base, and the second, fostering local nongovernmental organization.

The WWF sees the best solution to preserving biological diversity is to address the needs of local people. Indeed, without local support, conservation projects will not succeed. As an example of this, the WWF cites one of their projects in the Caribbean (Kremer 1985). In the Maria Islands in the Lesser
Antilles, the WWF involved local people, government and private institutions in planning and managing the area. The project includes training of local people in preserve management and the development of the island as an environmental research center as well as a tourist attraction.

Two other projects exemplify WWF’s efforts in conservation of diversity in the LAC region. According to the WWF, the most cost-effective means of identifying useful tropical plant species is through ethnobotany (the study of the use of plants by aboriginal people). WWF-US funds a project called 'Conservation and Ethnobotany,' aimed at documenting South American tropical forest species that have unexploited economic potential.

The second WWF project, called 'Minimum Critical Size of Ecosystems,' (MCS) is a joint WWF-US/Brazilian effort aimed at influencing long-term development policy. MCS involves establishing and analyzing 21 wildlife preserves covering 26,000 acres of Amazonian rainforest. The WWF/Brazilian team is isolating patches of tropical rainforest from 2.5 to 25,000 hectares to measure the impact of rainforest losses that result from development. The goal is to determine the relationship between the size of a national park or reserve and the preservation of the characteristic
diversity of the ecosystem and its species. WWF hopes the MCS project will lead to workable guidelines for development while maintaining tropical rainforest diversity (Kremer 1985).

The Nature Conservancy

The Nature Conservancy (TNC), founded in 1951, is a nonprofit membership organization committed to preserving biological diversity by protecting natural areas (National Wildlife Federation 1988). Though originally focused on habitat conservation in the United States, TNC did have a "Latin America Desk" from 1961 to 1969. The view eventually adopted by TNC was that its mission of preserving biological diversity will only be achieved when conservation is world-wide. According to a past Director of International Programs, "The health and wealth of the U.S. is related to "other parts of the biosphere...[thus]...biological conservation is a global business" (Beebe and Stroh 1986:4). But even more fundamental, TNC believes that biological conservation is a function of political, economic, and social stability.

Thus, beginning in the early 1970's, TNC began to seriously expand its overseas operations, particularly in Latin America. Here, TNC began to help government agencies and local conservation groups to protect
natural areas. TNC feels that only local people, using local resources and knowledge, can adequately deal with those issues which hinder the conservation of biodiversity. TNC efforts in Latin America reflect this attitude by focusing on people-oriented assistance rather than buying land (Beebe 1982).

TNC has a number of programs in Latin America aimed at fostering the conservation of biological diversity. One of these is assisting nongovernmental environmental organizations in ten Latin American countries. The aim is for these organizations to eventually work closely with government organizations responsible for managing the country's national park system (Shores and Houseal 1988).

Another program, similar to TNC's Natural Heritage Program in the U.S., is aimed at setting priorities for conserving biological diversity. According to F. William Burley, former Director of TNC's Biological Diversity Project, the Heritage Project is intended to be the "single most comprehensive repository of practical information" concerning the biological diversity of a nation (Burley 1982:25). A similar program sponsored by TNC is the establishment of Conservation Data Centers (CDC's). The program, started in 1972, involves seven Latin American countries and focuses on the collection, verification
and analysis of data about natural communities (Norris 1988). It involves classification of organisms and their habitats and ranking their rarity and potential danger from extinction or destruction. Finally, TNC also helps raise money for the purchase of lands. One example of this is their raising more than $2 million for the purchase of land for Guanacaste National Park in Costa Rica (McLarney 1988).

Discussion

According to the second stage of the Process Model, advocacy groups, such as nongovernmental environmental organizations (NGEOs), adopt the scientific concept but sometimes filter-out some of the related ideas which are important for a fuller understanding of the scientific concept. As a result, environmental positions presented to lawmakers may not contain a full range of information needed to develop comprehensive legislation pertaining to the scientific concept.

A number of important ideas related to biodiversity received wide attention within the scientific community but were either selectively dealt with or almost totally ignored by environmental organization personnel. One of these related ideas is the concept of the ecosystem. This is a concept which
itself has undergone much discussion and debate (O'Neill et al. 1986) but is closely associated with the concept of biodiversity. Within the scientific community, ecosystems are viewed from both a population-community viewpoint as well as from a process-functional one (O'Neill et al. 1986). From the population-community view a description of the ecosystem is obtained from a list of species while in the process-function view, a description might include energy pathways and geochemical cycles.

Thus advocates of conserving biodiversity would seemingly want to stress the idea of ecosystems as areas containing certain species as well as ecosystems as true locales for interactions and processes which maintain the ecosystem. However a content analysis of the testimony given by NGEO representatives during Congressional hearings on biodiversity (U.S. Congress. House. 1985), NGEO shows a 92% positive reference value for the process-community view of ecosystems (Table 6).

One possibility for the NGEO representatives to stress the population-community view is that it is easier to conceptualize than the process-functional view. That is, it is perhaps easier to visualize ecosystems as areas or as populations of species than it is to see ecosystems as a series of processes and interactions.
Table 6

First content analysis of NGEO representatives' testimony given during the 1985 Congressional hearings on biodiversity

Proposition: That during the 1985 Congressional hearings on biodiversity, NGEO representatives stressed the population-community view of ecosystems.

Unit of Analysis: Testimony of 10 NGEO representatives as found in 137 pages of hearing proceedings (U.S. Congress. House. 1985)

Scoring Units:

<table>
<thead>
<tr>
<th>Positive responses</th>
<th>Negative responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecosystem areas;</td>
<td>ecosystem processes;</td>
</tr>
<tr>
<td>ecosystem types;</td>
<td>ecosystem functions;</td>
</tr>
<tr>
<td>tropical rainforest ecosystems;</td>
<td>ecosystem energy pathways;</td>
</tr>
<tr>
<td>ecosystems and their species</td>
<td>ecosystem services;</td>
</tr>
<tr>
<td></td>
<td>ecological processes;</td>
</tr>
</tbody>
</table>

Positive responses: 35  Negative responses: 3

% positive responses = 35/38 = .92 = 92%
Another biodiversity related concept which environmentalists did not fully explain to lawmakers has to do with two basic approaches to diversity measurement. One measurement is the number of species in a sampled area and the other is the number of individuals in the total number of species, also called relative abundance. The distinction between the number of species in a sampled area and relative abundance is important because "maintenance of diversity is not simply a matter of ...preserving the total number of species within a community...but also of maintaining balanced and self-sustaining populations" (Collins 1986:94).

Another finding from the content analysis is that NGEO representatives did not stress all of the three broad themes of biodiversity as developed within the scientific community. Those themes being, ecosystem diversity, species diversity, and genetic diversity. NGEO representatives primarily stressed the theme of species diversity.

One problem, however, of only stressing species diversity is that it does not say anything about the interaction between species nor such factors as speciation, competition, and degree of specialization. As one scientist notes, these issues ultimately
determine how many species can coexist in a community (Ricklefs 1973).

To test whether NGEO representatives stress the view of biodiversity as the number of species in an area, as opposed to the relative abundance of species, a second content analysis was performed on NGEO representatives' testimony given during the 1985 Congressional hearings. The results of this analysis (Table 7) shows a 94% positive reference value for viewing biodiversity as the number of species in an area.

To see whether other NGEO representatives hold this view, a content analysis was performed on 9 papers presented by NGEO representatives at the National Biodiversity Forum and published in the Forum proceedings (Wilson 1988). Table 8 show the results of this analysis where the species-area view of ecosystems received 88% positive reference value.

Though there are scientific reasons for viewing biodiversity in both absolute and relative terms, it is evident that NGEO representatives stress biodiversity as the number of species in an area. Once again the rationale for this may be similar to that of viewing ecosystems as areas in that it is conceptually easier to visualize biodiversity in terms of species numbers. Also, as one NGEO representative notes, "Species have
an appeal which wins sympathy, an important factor in raising public awareness and helping fundraising" (Thorsell 1986:155).
Second content analysis of NGEO representatives' testimony given during the 1985 Congressional hearings on biodiversity

Proposition: That during the 1985 Congressional hearings on biodiversity, NGEO representatives stressed the view of biodiversity as the number of species in an area.

Unit of Analysis: Testimony of 10 NGEO representatives as found in 137 pages of hearing proceedings (U.S. Congress. House. 1985)

Scoring Units:

<table>
<thead>
<tr>
<th>Positive responses</th>
<th>Negative responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>biodiversity and:</td>
<td>relative abundance of species;</td>
</tr>
<tr>
<td>the number of species;</td>
<td>biodiversity and gene pools</td>
</tr>
<tr>
<td>endangered species;</td>
<td></td>
</tr>
<tr>
<td>associated species;</td>
<td></td>
</tr>
<tr>
<td>the maintenance of species</td>
<td></td>
</tr>
</tbody>
</table>

Positive responses: 15  negative responses: 1

% positive responses = $\frac{15}{16} = .94 \times 100 = 94\%$
Table 8

Content analysis of 9 articles written by NGEO representatives

Proposition: That the view of biodiversity as being the number of species in an area is reflected in 9 articles written by NGEO representatives

Unit of Analysis: 9 articles (43 pages) written by NGEO representatives and published in the proceedings of the National Biodiversity Forum (Wilson 1986)

Scoring Units:

<table>
<thead>
<tr>
<th>Positive responses</th>
<th>Negative responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity and:</td>
<td>relative abundance of species;</td>
</tr>
<tr>
<td>the number of species;</td>
<td>biodiversity and gene pools</td>
</tr>
<tr>
<td>endangered species;</td>
<td></td>
</tr>
<tr>
<td>associated species;</td>
<td></td>
</tr>
<tr>
<td>maintenance of species;</td>
<td></td>
</tr>
</tbody>
</table>

Positive responses: 38  
Negative responses: 5

% positive responses = \( \frac{38}{43} = 0.88 \times 100 = 88\% \)
CHAPTER FOUR

BIOLOGICAL DIVERSITY AND INTERNATIONAL AID AGENCIES

In the previous two sections, the views concerning biodiversity of the scientific community and nongovernmental environmental organizations were discussed. The next step is the transformation of these views into policy. This chapter will look at that transformation process and discuss the issue of biodiversity as it relates to economic development organizations.

The organizations to be discussed are the Agency for International Development (USAID) and the International Bank for Reconstruction and Development (i.e., the World Bank). To give some indication as to the magnitude of these organizations' influence, the World Bank and USAID together account for 60% of the world's foreign assistance donations to developing nations. These organizations not only fund economic development projects directly, but are also important in promoting environmental awareness through support of international conferences and policy studies. Taken together, these two organizations play a major role in fostering economic development and environmental concerns in developing nations.
The main responsibility for conducting U.S. economic development activities in Third World nations lies with the Agency for International Development formed in 1961 under the Foreign Assistance Act (FAA). This act provides USAID with Congressional mandates for conducting foreign assistance activities.

At its inception, USAID had no mandates relating to concern for environmental ramifications in development activities. It wasn't until 1975, when the Agency was sued by the Environmental Defense Fund over sales of pesticides to Third World nations, that Congress began to amend the Foreign Assistance Act to make USAID responsible for the environmental impact of their overseas activities (Table 9). As a result of the lawsuit [EDF v. Aid 6 ELR 20121 (D.D.C. 1975)] USAID issued new environmental regulations in 1976 (22 CFR part 216; 41 Fed Reg. 26913). USAID's environmental regulations followed the National Environmental Policy Act provisions and set forth Agency procedures in preparing environmental impact assessments and statements.

From 1977 to 1986, the U.S. Congress amended the Foreign Assistance Act incorporating many environmental concerns into USAID policy. In 1977, for example, the
Table 9

Chronology of events concerning USAID'S involvement with biological diversity

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>USAID sued over pesticide sales in developing countries [EDF v. AID, 6 ELR 20121]</td>
</tr>
<tr>
<td>1977</td>
<td>Foreign Assistance Act (FAA) amended to include environmental and natural resources as part of USAID's functional categories. Also stipulates that U.S. should help developing countries &quot;to protect and manage their environment and natural resources.&quot; [P.L. 95-92, 91 Stat. 614]</td>
</tr>
<tr>
<td>1978</td>
<td>FAA amended to include that U.S. should consider environmental consequences of development activities and that studies should be done &quot;to identify the major environmental and natural resource problems&quot; in developing countries. [P.L. 95-424; sec. 118]</td>
</tr>
<tr>
<td>1979</td>
<td>Exec. Order 12114 requires all federal agencies working abroad to have specific procedures relating to environmental impacts of their program activities.</td>
</tr>
<tr>
<td>1981</td>
<td>FAA amended recognizing the &quot;importance of forests and tree cover to the developing countries.&quot; In addition, the recommendations of the Interagency Task Force on Tropical Forests shall be considered in developing and implementing programs for developing countries. [P.L. 97-13, sec. 118]</td>
</tr>
<tr>
<td>1983</td>
<td>FAA amended instructing federal agencies to consider biological diversity conservation in economic development activities. USAID is to take the lead and organize an Interagency Task Force on Biological Diversity which shall develop a U.S. strategy on biological</td>
</tr>
</tbody>
</table>
diversity. In addition, annual reports to Congress are required concerning progress in implementing strategy. [P.L. 98-164, sec. 119]

1985 - U.S. Strategy on Biological Diversity issued (February).

1985 - Congressional hearings on "U.S. policy on biological diversity" (U.S. Congress. House. 1985)

1986 - FAA amended addressing tropical deforestation and new section added specifying actions to be taken with respect to biological diversity as well. [P.L. 99-190, sec. 302]

- USAID issues "Draft action plan for conserving biological diversity in developing countries."

- First progress report to Congress on implementation of U.S. strategy on biological diversity for FY 1985 (February).

- Congressional hearings on "Issues on biological diversity and tropical deforestation" (March).

1987 - Second progress report to Congress on implementation of U.S. strategy on biological diversity for FY 1986.

FAA was amended to include the environment and natural resources as part of USAID's original areas of responsibilities. In addition, the amendment authorizes the President "to furnish assistance...for developing and strengthening the capacity of less developed countries to protect and manage their environmental and natural resources." Also, "Special efforts shall be made to maintain and where possible restore land, vegetation, water, wildlife, and other resources." In both 1979 and 1981, the FAA was amended covering a series of environmental concerns. Among these were:

- USAID should identify major natural resource and environmental problems in developing countries and assist the host-country institutions responsible for addressing those problems (FAA 1978);

- USAID should emphasize forestry assistance in light of the fact that deforestation inhibits acquiring basic human needs (FAA 1979);

- USAID should consider the recommendations of the Interagency Task Force on Tropical Forests in "formulating and carrying out programs and policies with respect to developing countries" (FAA 1981).

These are just a sample of the types of amendments Congress added to USAID's mandate with respect to environmental and natural resource concerns. It shows that Congress and the Agency made a slow transition to
recognizing the importance of ecological awareness in development activities in the Third World.

Part of this awareness was the concern for biological diversity and in 1981 the U.S. Government sponsored the U.S. Strategy Conference on Biological Diversity. According to the sponsors, the conference was held to increase public awareness with respect to the importance of biological diversity, to begin discussing biological diversity issues between federal agencies, scientists, private businesses and Congressional representatives, and to make recommendations for public and private actions concerning biodiversity. Along with this was the realization that conservation of biological diversity is tied to economic development and that conservation "must become an integral part of development policies and programs" (U.S. Dept. of State 1981:13).

The conference agenda addressed five areas including terrestrial plant species; terrestrial animal species; aquatic species; microbial resources; and ecosystem maintenance. Among its major recommendations were:

- Establish an Interagency Task Force on conservation of biological diversity "to review current programs, develop comprehensive...U.S. goals and strategies to maintain biological diversity;"
The U.S. should promote and participate in establishment of a world-wide network in conservation areas;

Incorporate conservation planning into economic development planning.

Two years later, many of the recommendations made at the U.S. Strategy Conference were incorporated into the 1983 Foreign Assistance Act amendments (Appendix D). In making the amendments, Congress recognized that since species loss has "serious environmental and economic consequences for developing...countries," the preservation of plant and animal species "should be an important objective of the United States development assistance (FAA 1983, Sec. 119a). Among the more significant provisions concerning biological diversity were:

- "In order to preserve biological diversity, the President is authorized to furnish assistance...in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs" (FAA 1983, Sec. 119b);

- USAID, in cooperation with other government agencies, "shall develop a U.S. strategy, including specific policies and programs, to protect and conserve biological diversity in developing countries" (FAA 1983, Sec. 119c);

- Annual reports shall be made to Congress on the progress in implementing the U.S. strategy, as well as other provisions in the amendment (FAA 1983, Sec. 119c).
As a result of Sec. 119c, an Interagency Task Force was formed and two years later, in February 1985, they made their recommendations to Congress (USAID 1985). There were 67 specific recommendations under seven broad categories. These categories were:

1. Policy dialogue within federal agencies and less developed countries on biological diversity, helping less developed countries establish and implement national policies for conserving, managing and developing genetic resources.

2. Public awareness of the need to conserve biological diversity.

3. Developing country conservation institutions and increase conservation training.

4. Research and inventories related to conservation of biological diversity.

5. Balanced resource management and the designation and maintenance of protected areas.

6. Impacts of human population pressures on biological diversity and programs to deal with these pressures.

7. Coordination methods among development assistance agencies and support for nongovernmental conservation organizations.

The report also described what various federal agencies were doing with respect to biological diversity. USAID reported that it had 23 projects dealing with biological diversity. This was misleading since, according to Agency officials, biological diversity activities comprised only a
portion of other activities such as agroforestry, agricultural research, and institution building. (USAID 1985).

In response to the 1983 FAA amendments, USAID issued a Draft Action Plan on Conserving Biological Diversity in Developing Countries (USAID 1986). The Plan addressed how to diminish loss of biological diversity and how to deal with conflicts between conservation goals and economic development goals. The Plan also notes that the greatest loss is "of biological diversity resources for agriculture, forestry and range production: which, according to USAID, are the basis for providing basic human needs to rural people (USAID 1986:1). The plan also notes, however, that the need to conserve biological diversity goes beyond providing the basic human needs of people. Biological diversity is important for providing raw material for industrial development as well as providing ecosystem services such as nutrient cycling, carbon dioxide-oxygen exchange and atmospheric hydrological cycling.

The majority of the Draft Action Plan is devoted to specific actions USAID can take with respect to conserving biological diversity. In the U.S. Strategy on Biological Diversity, 33 of the 67 recommendations were identified as having potential USAID involvement.
USAID took the 33 recommendations and developed action plans to implement those recommendations. USAID categorized its actions into near-term and long-term events. Near-term actions were those to be completed within two years. Long-term actions were those which require additional resources and require longer time for planning and implementation. An example of a short-term action, under the "policy dialogue and national policies" category, is to incorporate Sec. 119 of the 1983 FAA amendments into USAID’s policy on environment and development. A long-term action is to help Missions identify and implement biological conservation training components of development projects.

The Draft Action Plan was written prior to the 1986 FAA changes and it is not clear how the 1986 changes will affect the Draft Plan. Comparing the Draft Plan and the 1986 FAA amendments, however, reveals that USAID is already complying with many of the 1986 changes. The one big difference is that the 1986 amendments earmark a specific amount of money to be spent on biological diversity activities.

A Congressional hearing was held in 1985 to review and analyze the U.S. strategy on biological diversity in general, and to review specifically USAID’s efforts in this area (U.S. Congress.

"After reading the [Strategy] report, I am concerned that it really advances a cohesive strategy to address the problem and whether AID is significantly increasing its resources toward this issue. However, the Congressional mandate is clear. We need a greatly expanded program to arrest the loss of biological diversity. The magnitude of the problem is huge, but efforts to date have been sorely inadequate.

All of the testimony given before the committee, with one exception, was from representatives of NGOs. They all made detailed comments concerning the U.S. strategy and USAID, but generally speaking, their criticism fell into one of the following categories:

- **FUNDING.** The Strategy makes no mention of funding levels each agency is willing to spend on biological diversity activities.
- **COMMITMENT.** Though responsibilities are allocated, no mention is made concerning agency commitment.
- **PRIORITIES.** The Strategy is a list of options and is not a strategy with priorities.
- **IMPLEMENTATION.** No commitment to implementation. There is no Interagency Biological Diversity Coordinator and no attempt to increase contact with NGOs actively involved in implementing biodiversity projects.
USAID also received criticism for its efforts in conserving biological diversity. For example, many of the NGOs chided the Agency for not having replaced its Biological Diversity Coordinator soon after that person resigned. At the time of the hearings, the position had been vacant for six months. This, in the eyes of some, showed a lack of commitment on the Agency's part to implement the 1983 FAA amendments (U.S. Congress. House. 1985). Also, the Agency was criticized for not formulating an implementation plan of its own, though this was in the process, since one was issued in 1986.

However some of the biggest criticisms came from the fact that in the U.S. Strategy report, USAID claimed it had 253 projects which addressed biological diversity concerns. These projects were criticized for being spread over too many sectors and, when pressed, USAID admitted that only five actually dealt with biological diversity. Even these five came under question because they were planned before the U.S. Strategy was written. Finally, many felt that USAID was slow to implement the 1983 FAA amendments, specifically Sec. 119b, which called for the Agency to assist countries "in developing wildlife management and plant conservation programs." The general feeling about USAID's efforts was best summed up in the
statement by Tom Stoel, Jr., representing the Natural Resources Defense Council (U.S. Congress. House. 1985: 44):

It is abundantly clear that AID has no real intention of providing the assistance Congress specified except in very small amounts which are wholly inadequate to deal with the problems.

In order to make USAID comply with Congressional wishes and to enhance the Agency’s efforts in conserving biological diversity, the NGEO representatives made numerous recommendations as to how Congress should change the FAA. The following themes emerged from these recommendations:

- Congress should require USAID to spend a minimum amount of money specifically for biodiversity projects.
- USAID should add a section to each host-country development strategy statement dealing with the biological diversity situation in that country. The Strategy Statement should also contain plans to assist the host-country in conserving biological diversity.
- USAID should use the World Conservation Strategy as a guide for conservation planning.
- USAID should use NGEOs whenever possible to achieve biodiversity activities.
- USAID should help build a global system of conservation areas.
- USAID should enter into more agreements with host-countries to help protect wildlife and ecosystems.
In its defense, John Erikkson, USAID Deputy Assistant Administrator for Science and Technology, testified that from USAID's standpoint, biological diversity needed to be broadly defined. Erikkson argued that since biodiversity concerns "cut across a wide range of sectors," biological diversity is considered at all levels of economic development planning (U.S. Congress. House. 1985:67). Hence, according to Erikkson, this is why USAID's programs are so broad. Given the importance of biological diversity for sustained economic development, USAID therefore will incorporate biodiversity activities into "ongoing or new programs," rather than develop a large number of new projects (U.S. Congress. House. 1985:84).

As to a recommendation that funds be earmarked for biological diversity activities, Erikkson noted that USAID opposes such action since it limits the Agency's flexibility in setting priorities, planning and implementing programs. Erikkson's comments did not convince the committee, nor Congress, that USAID was doing its best to comply with the 1983 FAA amendments on conserving biological diversity. Less than one year after the hearings, Congress passed the "Special Foreign Assistance Act of 1986" (Appendix E) which explicitly stated Congresses' intentions concerning the conservation of biological diversity.
In the Special Foreign Assistance Act of 1986, Congress rewrote Sec. 118 dealing with tropical forestry and amended Sec. 119 on protecting biological diversity. In addition to dealing with tropical forests in general, Sec. 118 contained three amendments which dealt specifically with biological diversity.

1. Identifying, establishing and maintaining a global network of "representative" tropical forest ecosystems;

2. Requiring that protected areas be established before funding projects which require forest clearing;

3. Help developing countries identify critical tropical forest ecosystems and species for protection and assist in establishing and maintaining those critical areas.

Sec. 119 deals exclusively with protecting biological diversity. The amendments are extensive and it is clear that many of the recommendations made during the Congressional hearings were incorporated into the Act. Some of these were:

- USAID must allocate a minimum of $2.5 million for biological diversity activities. Specifically for Sec. 119b which is "to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs;"

- USAID should use NGEOS, whenever possible, to implement sec. 119;
Development Strategy Statements must identify activities necessary to conserve biological diversity in host-country;

USAID should use the World Conservation Strategy as a guide for planning and implementing conservation of biological diversity programs;

USAID must revise its environmental regulations to include impacts on biological diversity from economic developmental activities.

USAID immediately took two steps to implement the new FAA requirements. First, in an effort to explore better Agency responses to conserving biological diversity, USAID initiated dialogues with NGEOS, and private foundations working in the biodiversity area. The Agency wanted to establish an informal "biological diversity consultative group" which would help the Agency better plan its biodiversity activities, provide better coordination among donors, and evaluate program effectiveness.

The second step was to establish an internal USAID biological diversity working group to oversee the allocation and utilization of the $2.5 million earmarked funds. In order to evaluate which projects to consider for the allocation, the working group developed administrative and ecological criteria (Appendix F). From these criteria, 21 projects were chosen to receive part of the $2.5 million (actually
only $2.388 million was earmarked after budget cuts). The funds were distributed fairly evenly over all the regional bureaus and the Washington central bureaus of Science and Technology and Program and Policy Coordination (Table 10).

The Agency also began to implement the 1986 FAA amendments requiring the use of NGEOs and PVOs to implement biodiversity activities. For example, almost one-half of the $2.388 million went to NGEOs and PVOs to implement biodiversity activities and of that, over $500,000 went to the World Wildlife Fund alone.

Despite the $2.5 million earmarked funds for biodiversity projects, it is clear from comments made by John Eriksson, USAID Deputy Assistant Administrator for the Bureau of Science and Technology, during the 1985 Congressional hearings that USAID planned to build conservation strategies into broader projects (U.S. Congress. House. 1985). If one believes that biological diversity issues do cross sectoral lines and that diversity is critical for sustaining economic development, the USAID's course of action makes some sense.

However USAID implements its biodiversity strategy, the agency has still been criticized for its slow implementation of conservation initiatives, several factors are seen as hindering the Agency's
Table 10
Summary of USAID biological diversity funding activities under the FY 1987 legislated earmark

<table>
<thead>
<tr>
<th>SUMMARY OF ACTIVITIES</th>
<th>TOTAL: $2.388 million</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AFRICA BUREAU</strong></td>
<td><strong>PROJECT TITLE</strong></td>
</tr>
<tr>
<td>Kenya</td>
<td>Rhino Conservation</td>
</tr>
<tr>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Madagascar</td>
<td>Madagascar Wildlands and Human Needs</td>
</tr>
<tr>
<td>$200,000</td>
<td></td>
</tr>
<tr>
<td>Mali</td>
<td>Niger Delta Wetlands Conservation</td>
</tr>
<tr>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td>Tanzania</td>
<td>Wildlife Management at Mweka College</td>
</tr>
<tr>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$550,000</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ASIA NEAR EAST BUREAU</strong></th>
<th><strong>PROJECT TITLE</strong></th>
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</thead>
<tbody>
<tr>
<td>Burma</td>
<td>Burma Conservation Professional Training</td>
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<tr>
<td>$50,000</td>
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<tr>
<td>Indonesia</td>
<td>Indigenous NGO Support</td>
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<tr>
<td>$54,000</td>
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</tr>
<tr>
<td>Nepal</td>
<td>Rhino/Water Buffalo Interactions with Humans</td>
</tr>
<tr>
<td>$75,000</td>
<td></td>
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<tr>
<td>Philippines</td>
<td>Philippines Biological Diversity Survey and Action Plan</td>
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<tr>
<td>$78,000</td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>Biodiversity Small Grants Program</td>
</tr>
<tr>
<td>$293,144</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>Thailand Biodiversity Grants</td>
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<tr>
<td>$60,856</td>
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<tr>
<td>Yemen</td>
<td>Alternatives to Rhino-Horn Dagger Handles</td>
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<tr>
<td>$7,000</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>$618,000</td>
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</tbody>
</table>
Table 10 - cont.

LATIN AMERICA AND THE CARIBBEAN BUREAU

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belize</td>
<td>$60,000</td>
<td>Hol Chan National Marine Park</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>$75,000</td>
<td>Corcovado National Park Buffer Zone</td>
</tr>
<tr>
<td>Ecuador</td>
<td>$100,000</td>
<td>Botanical Survey of Eastern Ecuador</td>
</tr>
<tr>
<td>Haiti</td>
<td>$65,000</td>
<td>Haiti National Marine Park</td>
</tr>
<tr>
<td>Peru</td>
<td>$220,000</td>
<td>Yanachaga/Chemillen National Park</td>
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<tr>
<td>TOTAL</td>
<td>$500,000</td>
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</tbody>
</table>

WASHINGTON FUNDED PROJECTS

<table>
<thead>
<tr>
<th>Amount</th>
<th>Project Description</th>
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</thead>
<tbody>
<tr>
<td>$150,000</td>
<td>AID/Peace Corps Biological Diversity Initiatives</td>
</tr>
<tr>
<td>$150,000</td>
<td>Biological Diversity Consultantive Group</td>
</tr>
<tr>
<td>$270,000</td>
<td>Biological Diversity Technical Support</td>
</tr>
<tr>
<td>$50,000</td>
<td>Economic Incentives for Biological Diversity Conservation</td>
</tr>
<tr>
<td>$100,000</td>
<td>Techniques for Monitoring and Evaluating Trends in Biological Diversity</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$720,000</td>
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</tbody>
</table>

Source: Saterson 1987
implementation efforts. Some of these, admittedly, are of the Agency's own doing. USAID officials, for example, have always believed that many of their projects already address biodiversity issues. Thus they see no need in creating a host of new projects for conserving biological diversity. Also, though the Agency's budget has been cut by Congress, the Agency itself cut budgets of those offices which fund the majority of biodiversity activities. For example, USAID's FY 1986 budget was reduced by Congress by 4.3%. The Agency itself, however, cut 25% of the budget of the Office of Forestry, Natural Resources and Environment, where most of the biodiversity projects are located. In addition, other offices where biodiversity activities occur, e.g., Agriculture and Rural Development and Health and Nutrition, were also cut (OTA 1987).

Budget cuts have also affected the hiring of more people formally trained in natural resources. Recommendations have been made, for example, that each Mission have at least one person formally trained in an environmental science (U.S. Congress 1985). One problem with this is that the number of positions each Mission can have is dictated, in part, by the host-government. To add another person to the Mission requires permission by the host-government and the
Missions themselves are not anxious to have numerous employees. For one, it is expensive to maintain an expatriate overseas. Such maintenance costs come out of the Mission's budget. For another thing, given the limited position allotment, most Mission Directors want to hire 'generalists.' That is, someone who can function, for example, as both an Agricultural Officer and Rural Development Officer or a Health Officer and a Nutrition Officer. Environmentalists are often viewed as being specialists who often times do not have enough work to keep them busy.

Another factor which hinders implementation is that the language in Sec. 119 is very narrowly focused, due perhaps, to the influence of NGEO spokespeople's testimony before Congressional hearings. Sec. 119(b), for example, is fairly explicit about development and protection of wildlife habitats, sanctuaries, and preserves. Such phrasing seems more appropriate for an agency whose main responsibilities is natural resources, not an agency which has legislative mandates for an array of other areas. As noted by former USAID Administrator McPherson, conservation of biological diversity is but one of many priorities mandated by Congress, such as women in development, child welfare, health and nutrition, and population. The problem is there are too many such
mandates which Congress has not prioritized and these mandates are viewed as hindering USAID's program flexibility and efficient management (McPherson 1986). Though USAID has been criticized for its program implementation, no agency or organization has received as much criticism for its total lack of environmental concern as the World Bank.

**The World Bank**

The emphasis of the biodiversity issue within World Bank policies is quite different than that of USAID's. This is due, in part, to the nature of the World Bank organization and to the relative short history of general awareness of environmental issues by the World Bank (Table 11).

After the Second World War, there was a need to rebuild economies destroyed by the war and to meet this challenge, two complimentary financial institutions were formed. One of these, the International Monetary Fund (IMF), was formed to "provide for international currency stability by helping to finance IMF members temporary balance of payment deficits" (IBRD 1954:3). The other institution, the International Bank for Reconstruction and Development (i.e., the World Bank), was formed to finance the economic reconstruction of World Bank member countries. Unlike the IMF, the World
Table 11
Chronology of events leading to World Bank's current environmental position


1974 - Bank issues "Environmental, Health, and Human Ecologic Considerations in Economic Development Projects."

1978 - Bank issues forestry sector policy paper.

1980 - Bank signs "Declaration of Environmental Policies and Procedures Relating to Economic Development."

1983 - Congressional hearings held on the "Environmental Impacts of Multidevelopment Banks."

1984 - Congressional hearings held on "Draft Recommendations on the Multilateral Banks and the Environment."

- Bank issues "Environmental Policies and Procedures of the World Bank."


- Bank co-sponsors study and publication of "Tropical Forests: A Call for Action."


1987 - Barber Conable, President of the World Bank, addresses World Resources Institute on World Bank’s changes with respect to environment and economic development.

- Bank publishes "Environment, Growth, and Development."

- Bank reorganizes environmental operations.

Bank provides longer-term funds for investment in productive endeavors (Payer 1982). The "Articles of Agreement" for the World Bank were formally accepted on December 27, 1945, and the World Bank officially commenced operations in June of 1946.

The World Bank has traditionally supported large infrastructure projects such as roads, railways, port facilities, power facilities and has spent large amounts of money to do so. For example, in 1988 alone, the Bank disbursed over $11 billion in development loans. Bank critics say that given the magnitude of the Bank's program, there is great potential for environmental damage and the Bank seems to lack concern for the environmental consequences of their developmental efforts (Adams 1985; Goldsmith 1985; Payer 1982).

Evidence abounds as to the World Bank's lack of environmental concern. For example,

Despite strong policy statements about environmental protection and sustainable development, at an operational level much of the preparation and implementation of Bank loans is free of routine environmental analysis (Rich and Schwartzman 1986:35).

Critics also have noted that the World Bank is a "law unto itself" because it does not allow public scrutiny of its programs and policies (Adams 1985) and
still others note that the Bank is often the cause of environmental havoc in developing countries (Dogra, 1985; Goldsmith 1985; Payer 1982; Rich 1985). For example, in the early 1980's the World Bank loaned $112 million for an agriculture and resettlement project in Africa. The project resulted in "destruction of tropical rainforest, pesticide contamination of drinking water supplies, and rampant disease" (Wirth 1986:33).

Another example comes from Brazil where the Bank made a $304 million loan for the construction of railroads and port facilities in the Amazon region. This was seen by many critics as part of a larger Brazilian-sponsored plan which would result in the destruction of 15,000 km$^2$ of rainforest. The World Bank, however, saw no connection between their loan and the Brazilian Government plan, even though the projects funded by the World Bank were essential for the success of the Brazilian-backed scheme (Caufield 1987).

Unlike USAID, the World Bank is an international organization without direct control by any one government. But, since the United States controls about 20% of the Bank's total voting power, the U.S. can be somewhat influential. To this end, the U.S. Congress held hearings in 1983 and 1984 on the environmental impacts of the World Bank as well as
other multidevelopment bank (such as the Asian Development Bank, the African Development Bank, and the Inter-American Development Bank) activities. As noted by Congressmen Bereuter "environmental concerns should be one of the major concerns of MDBs and Congress has a responsibility to ensure that MDBs fulfill their environmental obligations" (U.S. Congress 1983:4).

Another purpose of the 1983 Congressional hearings was to gauge the progress of those MDBs who signed the "Declaration of Environmental Policies and Procedures Relating to Economic Development" (Table 12). As subcommittee member Mike Lowry said, it had been three years since MDBs had signed the Environmental Declaration and "now is a good time to review...[their progress and to] recommend changes" (U.S. Congress 1983:3). To this end, the hearings focused on the environmental impacts of MDB-funded projects in developing countries and considered recommendations to change MDB policies where needed. In the end, the hearings uncovered some of the inadequacies in existing environmental procedures of MDBs. Among these were:

- Lack of mandatory environmental guidelines and procedures;
- Too few environmental professionals on MDB staff;
Table 12

Declaration of environmental policies and procedures relating to economic development

The Declaration states that the Multilateral Banks will:

- institute procedures to systematically examine their development activities for compliance with the recommendations and principles of the 1972 Stockholm Conference on the Human Environment;

- enter into negotiation with governments and international agencies to ensure integration of environmental measures in the design and implementation of environmental activities;

- provide technical assistance on environmental matters, at the request of developing countries, to develop indigenous capacities and to facilitate technical cooperation among developing countries;

- consider and, if appropriate, support projects designed to protect, rehabilitate, manage or enhance the human environment;

- cooperate in research and studies leading to improved project appraisal, implementation and evaluation methodologies;

- support the training of MDB operational staff in the environmental dimension of economic development activities; and

- prepare and disseminate information on environmental aspects of development activities.
No integration of environmental concerns at early stages of project identification and preparation;

In preparing country and sector documents, no consideration is given to environment in the policy recommendations section.

But, according to a World Resource Institute spokesperson, what is really needed is for MDBs to make fundamental changes in "operating policies, analytical approaches and even the conceptualization of development itself" which reflects environmental concern (U.S. Congress 1983:56).

The 1983 hearings led to a series of recommendations directed toward the environmental concerns of MDBs and the 1984 hearings focused on those recommendations. As one subcommittee member commented, "The subcommittee recommendations reflects a growing Congressional concern that sustainable, ecologically sound development must be a basis for international development assistance efforts" (U.S. Congress 1984:4).

The recommendations were sent to the U.S. Department of Treasury, the World Bank Group, the Asia Development Bank, the African Development Bank and Fund, and the Inter-American Development Bank and Fund. Though, as noted above, the U.S. has no direct control over the World Bank, and other MDBs as well, it does have a large share of the voting power due to their
contribution level. It is through this financial leverage that the U.S. can have some limited control over the World Bank's policies. During the annual authorization process, Congress can review the compliance with recommendations. If there is reluctance on the part of MDBs to enact recommendations, Congress can show its own reluctance by not funding MDB requests.

Another way Congress can have some control over MDB operational policy is to tie their recommendations to appropriation bills. This is exactly what Congress did in the 1985 appropriations bill (Appendix G). Sec. 540 of the law (P.L. 99-190) specifies what measures MDBs are to take with respect to integrating environmental concerns into their programs. One of the major differences in this law versus those which pertained to USAID and other U.S. Government agencies is the lack of any reference to biological diversity. There is no clear indication as to why references to biodiversity were left out, but it is suggested that lawmakers, based upon Congressional testimony from NGEOS representative, were more concerned with developing an over-all environmental program within the MDBs than specifying detailed policies related to biodiversity.
The subcommittee made over 16 recommendations, not all of which applied to the World Bank (Appendix H). Those that did apply to the Bank ranged from having a staff member in each of the Bank's regional offices responsible for environmental issues to using the World Conservation Strategy as a guide in developing economic development strategies. What is noticeably absent from any of the recommendations is the explicit call for conserving biological diversity. Indeed, throughout all of the hearings, the issue of biological diversity was raised only once (U.S. Congress. House. 1984).

It is possible that the over-all environmental record of the MDBs was so dismal that lawmakers and environmentalists placed their efforts on moving the MDBs to at least the level of USAID with respect to considering the environmental impact of their developmental policies. Unlike USAID, the World Bank has not had as much Congressional scrutiny of its environmental programs. This is partially due to the fact that Congress does not have as much leverage over the World Bank as it does over USAID.

But despite these issues, the World Bank has changed its posture with respect to environment and development and has manifested these changes through departmental reorganization, policy statements, and
position papers. These changes are a result of both external as well as internal pressures.

Since 1970, the World Bank has had an Office of Environmental and Scientific Affairs which focused on the environmental impacts of individual projects. This office contained six full-time professionals, only three of whom were actually involved in reviewing of environmental impact of projects. But though the Bank lacked trained personnel to review projects, the World Bank did show signs of awareness and concern for the environmental consequences of their projects.

For example, in 1974, the Bank issued a handbook titled "Environmental, Health and Human Ecologic Considerations in Economic Development Projects" (World Bank 1974). In the preface of the handbook, the World Bank acknowledged that "all who are involved in a proposed project...[must have]...as clear an understanding as possible of the potential positive and negative environmental consequences of developmental activities" (World Bank 1974:iii). The handbook is intended as a reference for World Bank project designers for the "detection, identification and measurement of environmental and related human ecological effects" (World Bank 1974:iii).

Similarly, in 1978, the Bank issued its forestry sector policy paper (World Bank 1978). This paper
stresses the role of forestry in rural development and the role forests play in environmental stability. The policy outlines four areas which the Bank will focus its forestry sector lending program. These areas range from "environmental forestry," (e.g., watershed rehabilitation, forest inventory), to "industrial forest" projects. Absent from the policy is any reference to, or the need for, conserving forests or unique forest ecosystems.

In 1980, the World Bank began to show its change in attitude when it signed, along with eight other MDBs, the "Declaration of Environmental Policies and Procedures Relating to Economic Development." The idea behind the Declaration was for MDBs to exchange information and plans on improving MDB environmental performance.

But real manifestation of the World Bank's new attitude toward environmental and development came in 1984 with the issuance of the World Bank's "Environmental Policies and Procedures" (World Bank 1984), and in 1986 with the "World Bank's Operational Policy on Wildlands: Their Protection and Management in Economic Development" (World Bank 1986). These documents marked the first time in the Bank's history that environmental policies and guidelines were
incorporated into the Bank's operation manual (Rich 1985).

According to World Bank ecologist, Robert Goodland, the Bank's Wildland Policy focuses primarily on the preservation of wild plants and animals and their habitats (Goodland 1988). The policy covers six specific elements which are addressed at various stages of the Bank's project cycle (Table 13). Though much of the Bank's change in philosophy can be attributed to the 1983 and 1984 Congressional hearings and subsequent passage of PL 99-190, sec. 540, a great deal of credit must go to the President of the World Bank, Barber Conable.

Since his tenure began as Bank president, Conable has been an advocate of a more environmentally-oriented World Bank. In a 1987 speech before the World Resources Institute, Conable outlined the World Bank's new environmental approach. Conable said that a number of steps will be taken to reform and integrate environmental considerations into the World Bank's developmental schemes. One of these is the creation of an Environmental Department which will become involved in directing Bank policy, planning, etc. This department is to be directly under the Vice-President of Sector Policy Research. In addition, the number of policy-level environmentalists will increase from 15 to
Table 13

Environmental interventions in World Bank's project cycle

<table>
<thead>
<tr>
<th>PROJECT IDENTIFICATION</th>
<th>PROJECT ACTIVITY</th>
<th>ENVIRONMENTAL INTERVENTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Identification</td>
<td>Projects identified which support national and sectoral policies and objectives.</td>
<td>Regional environmental staff and Environmental Department review projects to determine if and how wildlands are to be converted and ways to avoid or diminish conversion. Also determine whether areas should be preserved as part of the project.</td>
</tr>
<tr>
<td>Project Preparation</td>
<td>Specification of objectives, timetable for achieving objectives; technological, economic, and institutional inputs are necessary for project success; possible alternatives.</td>
<td>Necessary environmental studies are conducted. Studies include whether wildlands are to be converted and alternatives, to conversion.</td>
</tr>
<tr>
<td>Project Appraisal</td>
<td>Project evaluated as to its technological, economic, and institutional feasibility. Used to determine conditions of loan.</td>
<td>Environmental staff evaluates any wildland management and other environmental aspects of project.</td>
</tr>
</tbody>
</table>
Table 13 - cont.

<table>
<thead>
<tr>
<th>Project</th>
<th>Implementation and supervision.</th>
<th>Project</th>
<th>Evaluation</th>
<th>Project Negotiation</th>
<th>Implementation and supervision.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Terms of loan, legal obligation</td>
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<td>Any wildland conserv-</td>
<td>Implementation of wildland com-</td>
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<td></td>
<td>of World Bank and borrowing</td>
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<td>ation, protection and/</td>
<td>ponents are handled like other</td>
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<td></td>
<td>governments.</td>
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<td>or management are to</td>
<td>project’s main components.</td>
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<td>part of loan agreement</td>
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<td>Implementation of</td>
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<td>wildland components</td>
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<td>In some instances, en-</td>
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<td>vironmental components</td>
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Adapted from World Bank 1984
65 and similar increases will also occur at the regional operations level and in the field. Each of the regional technical departments will have responsibility for ensuring environmental-soundness of Bank projects as well as promote sustainable resource management programs.

Conable went on to say that even though the World Bank will continue to finance infrastructure, energy, industrialization, and irrigation projects, the Bank will "include greater sensitivity to their long-term environmental effects" (Conable 1987:6). To this end, the Bank will:

- Make assessments of those developing countries which have the "most severely threatened environments;"
- Promote initiatives to halt desertification and destruction of forests in Africa;
- Support tropical forest conservation;
- Cooperate in efforts to protect seas and coastlines.

In effect, the World Bank will place new emphasis on changing those activities which lead to environmental abuse and promote those activities which lead to environmental enhancement.

Responsibility for implementing the World Bank's new wildland management policy will be that of the regional staff, with assistance from the central
Environmental Department. The Environmental Department will mainly provide technical support and other operational support as needed (Ledec and Goodland 1988). The Bank has identified a number of "operational instruments" through which the wildland policy will be implemented (Table 14).

For the World Bank, and other MDBs, their impact on biological diversity will, to a large degree, depend upon the development and implementation of environmental guidelines. Since the World Bank is in the process of formulating environmental guidelines, how the guidelines incorporate biodiversity concerns will signal the Bank's approach to biodiversity. Also, biodiversity concerns can best be dealt within the course of designing and implementing the projects if environmental guidelines contain provisions for conserving biological diversity. It would be a little late, for example, to worry about biodiversity of an area after a hydroelectric dam was built and operating.

On the other hand, some ecologists feel that the most immediate effect of the MDBs on the conservation of biological diversity is in the creation of protected areas, and in this area, "the World Bank has been the leader" (Rich and Schwartzman 1986:346). As an example, the Bank has financed the protection of over 59,000 Km² in 17 countries. Most of these protected
Table 14

World Bank operational instruments
for implementing environmental policies

1. ENVIRONMENTAL ISSUES PAPERS. These are intended to
be in-depth coverages of an array of environmental
issues that face developing countries.

2. COUNTRY STUDIES. These are analysis of
environmental issues triggered by host-country
requests. For example, Indonesia has requested
World Bank to provide analysis of the issues of
tropical deforestation, conservation of species, and
protection of critical ecosystems in Indonesia. The
result of the country study is the development of
methodologies for improved environmental management
which, ultimately, contribute to a country's
economic growth, poverty alleviation and
environmental conservation.

3. LENDING OPERATIONS. Environmental considerations
will be part of the Bank's lending and policy
dialogue with host-countries. This will result in
an increase in the number of sectoral loans having
environmental components.

4. PROJECT REVIEW. Projects will be reviewed by more
people from a broader range of disciplines. Every
stage of the project cycle (see Table 14) will be
reviewed for potential environmental impacts and the
operational staff will be alerted to the need to
remedy adverse situations.

Adapted from World Bank:1988
areas are what the Bank calls "wildlands of special concern" (Ledec and Goodland 1988:33). These areas are identified as being of exceptional importance for conserving biological diversity or for perpetuating environmental services. The World Bank categorized wildlands of special concern into two types:

1. Wildlands officially designated as protected by governments;

2. Wildlands that are not yet protected by legislation but that have been recognized by national or international scientific and conservation committees as exceptionally endangered ecosystems, known sites of rare or endangered species, etc.

Finally, in addition to the creation of protected areas, World Bank officials also feel the Bank can help diminish the impact on unique ecosystems through its traditional lending policies in the transportation, agriculture, energy, and industrial sectors (World Bank 1988).

There is no doubt that World Bank leaders intend to promote the conservation of biological diversity. They will not, however, elevate the conservation of biodiversity to the level found at USAID. Instead, the Bank will incorporate biological diversity concerns into larger economic development projects. The Bank will fund strictly conservation programs. But, unlike USAID, the Bank will probably not earmark a certain
portion of its lending budget solely for biological conservation projects.

It is evident that the way biological diversity concerns are manifested in the policies of the World Bank and USAID is quite different. Given the political importance of both the biological diversity issue and the magnitude of World Bank influence in the developing world, it would seem that biodiversity would have the same status in Bank policies as in USAID's. Such is not the case, however.

For one thing, as noted above, the nature of the World Bank organization is such that it is not under the direct control of any one government. Thus the amount of government control over Bank policies and guidelines is limited. Another factor is that, compared to USAID, environmental procedures have only recently been formally incorporated into Bank operating policies and procedures. At this point, many view it more important to get the Bank to look at the impact of its programs over the total environmental spectrum. This is seen in some of the recommendations made during the Congressional hearings and subsequently enacted into law through PL90-190.

Despite their differences, the World Bank, like USAID, has incorporated the concept of biological diversity into its programs. Though the concept of
biological diversity has been transformed into natural
resource policy by both organizations, a number of
issues still remain to be resolved. The next chapter
will look at some of these issues.

Discussion

The third stage of the Process Model is the
legislative phase where the scientific concept is
transmitted to lawmakers by advocacy groups and the
lawmakers, in turn, pass legislation related to the
scientific concept. For biological diversity,
Congressional lawmakers passed two pieces of
legislation, one in 1983 and another in 1986.

In 1983 Congress passed the "International
Environmental Protection Act." This legislation
reflects closely those views expressed by NGEO
representatives. For example, in the 1983 Act,
biodiversity is tied closely with the concept of
species and especially with wildlife and wildlife
habitats. In Sec. 119, the preservation of biological
diversity is linked directly to "...the preservation of
animals and plant species...".

In addition, the Act emphasizes the concept
of ecosystem as an area by stating that to preserve
biological diversity it is necessary to protect and
maintain wildlife habitats by "...establish[ing] and
maintain[ing] wildlife sanctuaries, reserves, and parks." No where in the Act is it mentioned that conservation of biodiversity should consider ecosystems from both the population-community as well as the functional-process standpoints.

In 1986, a second piece of legislation was passed related to biodiversity and was included under the "Special Foreign Assistance Act of 1986." Title III, Sec. 302 of this Act contains the provisions related to protection of biological diversity. This is a much shorter piece of legislation than the 1983 Act and basically supplements the 1983 Act. Like the 1983 legislation, biodiversity is linked to wildlife species and their habitats and the protection of ecosystems.

Table 15 is the result of a content analysis performed on the 1983 and 1986 pieces of legislation on biodiversity. The results show that the language of the legislation stresses the population-community view of ecosystem as well as the characterization of biodiversity as the number of species in an area.

Based upon the legislation dealing with biological diversity, it appears that lawmakers have interpreted biodiversity to consist of animal and plant species in ecosystems defined in terms of areas. This view very much coincides with the views stressed by NGEQO representatives. In addition, absent from the pieces
Table 15

Content analysis on 1983 International Environmental Protection Act and the 1986 Special Foreign Assistance Act

Proposition: That the language of the 1983 International Environmental Protection Act and the 1986 Special Foreign Assistance Act reflects the view that biodiversity is closely associated with the concepts of species in an area, and the population-community view of ecosystems.


Scoring Units:

<table>
<thead>
<tr>
<th>Positive responses</th>
<th>Negative responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>biodiversity and:</td>
<td>biodiversity and:</td>
</tr>
<tr>
<td>animal species;</td>
<td>gene pools;</td>
</tr>
<tr>
<td>plant species;</td>
<td>ecosystem processes;</td>
</tr>
<tr>
<td>wildlife;</td>
<td>ecosystem functions</td>
</tr>
<tr>
<td>wildlife habitat;</td>
<td></td>
</tr>
<tr>
<td>wildlife species;</td>
<td></td>
</tr>
<tr>
<td>critical habitats</td>
<td></td>
</tr>
</tbody>
</table>

Positive responses: 26  Negative responses: 2

% positive responses = 26/28 = .92 x 100 = 92%
of legislation are any indication of the uncertainties of the biological diversity concept as expressed by members of the scientific community. Indeed, absent is any specific definition of biodiversity as well as specific reasons why biodiversity should be conserved.

Also, the fact that legislation is narrowly focused on species and habitats, may be evidence that ideas related to the biodiversity concept were not made clear to lawmakers or were not presented to lawmakers at all. Had lawmakers been made aware of some of these related concepts and some of the uncertainties surrounding the biodiversity concept, perhaps the legislation passed concerning biodiversity would have been more focused and provided more direction to those responsible for operationalizing the laws.

Both the 1983 and 1986 pieces of legislation were directly aimed at U.S. Government agencies operating overseas, and particularly at the operations of USAID. However because of the magnitude of the World Bank program, the environmental policies of this organization, as well as other Multinational Development Banks (MDBs), came under Congressional scrutiny. As discussed earlier, during Congressional hearing on the World Bank and other MDB operations, the concept of biological diversity was not even mentioned. The focus of these hearings was upon the over-all

In 1985, as part of the Appropriations bill for U.S. funding of MDBs, Congress added legislation pertaining to the environmental policies of MDBs. This is a much different piece of legislation in that it is much broader in scope and does not deal specifically with the conservation of biological diversity.

For example, the 1985 Appropriations bill calls for MDBs to 'vigorously promote' such activities as reviewing the environmental soundness of projects, the 'development of environmentally beneficial projects,' and the training of professional staff in environmental and natural resource planning and environmental impact assessment.

In addition, the bill stipulates that MDB leaders meet to discuss environmental problems related to their respective MDB operations as well as discuss ways to improve environmental performance. It is not clear why lawmakers did not specifically address the biological diversity issue. One possibility is that since the over-all environmental performance of MDBs was viewed as being poor, Congressional lawmakers were more concerned with MDB personnel developing more environmentally-sound economic development polices. As
noted by one Committee member, he didn’t hear any testimony to the fact that MDBs had improved their environmental performance over the past 10 years (U.S. Congress. House. 1983). Thus based upon the 1983 hearings, Congress developed recommendations for improving MDBs over-all environmental performance.

In stage four of the policy process, legislation passed by Congress concerning the scientific concept must be operationalized. Though biodiversity legislation applies to all U.S. Government agencies operating overseas, the major responsibility for implementing Congressional intent is the U.S. Agency for International Development. Based upon biodiversity legislation, USAID wrote a "Draft Action Plan on Conservation of Biological Diversity in Developing Countries" (USAID 1986).

An indication of how USAID personnel interpret Congressional intent is seen in the opening paragraph of the Action plan. This opening paragraph states that "...biological diversity refers to the number of species...the genetic variation within each species...and the variety and complexity of habitats and ecosystems" (USAID 1986:B-1). Thus it appears that Agency policy makers have, to some extent, followed the views of biodiversity expressed by NGEIO representatives and Congressional lawmakers: that biodiversity is the
number of species in an habitat or ecosystem which, in
turn, may be viewed strictly as an area.

Language throughout the Action plan supports this
view. For example, the Plan links "Effective
conservation of biodiversity..." with "protected area
management..." (USAID 1986:B-7), and the need to better
understand the "...existence and distribution of
important habitats...as well as the need to determine
the...distribution of valuable individual species..."
(USAID 1986:B-12).

After the 1985 Congressional hearings on the U.S.
policy on biological diversity, USAID staff developed a
formal policy on biodiversity which is contained in the
Agency’s policy on "Environment and Natural Resources"
(USAID 1988). The Environmental and Natural Resources
policy addresses how USAID will link the need for
economic development activities with the need to
protect and enhance natural resources. The policy
states that

The Agency’s central environmental objective
is to promote environmentally sound, long-
term economic growth by assisting developing
countries to conserve and protect the
environment and manage their exploited resources
for sustainable yields" (USAID 1988:1).
As part of this objective, "Efforts to protect and conserve biological diversity will be emphasized" (USAID 1988:1).

The 1988 policy statement continues to define biodiversity in terms of species and areas, as opposed to processes, functions, and interactions. For example, the policy statement refers to such things as "...protecting and maintaining wildlife habitats...," "...habitat destruction...," "...habitat loss...," and "...preserve species."

In addition, the guidelines sent to field missions for addressing the policy also defines biodiversity in terms of species and areas. For example, the cable states that mission personnel are to determine "...the status and management of protected areas," "...the status and protection of endangered species," and "...the status of conservation of economically important species" (U.S. Dept. State 1988).

A content analysis was performed on the 1988 USAID policy on Environment and Natural Resources and the USAID cable to field missions to test the proposition that USAID policy characterizes biodiversity in terms of species and areas, and less so as processes and functions. The results of this analysis (Table 16) shows an 88% positive response value for the proposition. In contrast to USAID, the World Bank
Table 16

Content analysis of USAID Environment and Natural Resource Policy and the USAID cable to field missions concerning policy implementation

Proposition: That official USAID policy on conservation of biodiversity stresses the view that biodiversity is closely related to the concepts of species in an area and the population-community view of ecosystems.

Unit of Analysis: USAID's policy on Environmental and Natural Resources (1988) and the Guidance Cable Addressing Biological Diversity and Tropical Forestry in CDSSs and other Country Plans.

Scoring Units:

<table>
<thead>
<tr>
<th>Positive responses</th>
<th>Negative responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity and:</td>
<td>Biodiversity and:</td>
</tr>
<tr>
<td>wildlife habitats;</td>
<td>genetic variability;</td>
</tr>
<tr>
<td>species;</td>
<td>ecosystem processes;</td>
</tr>
<tr>
<td>habitats;</td>
<td>ecosystem services;</td>
</tr>
<tr>
<td>preserves;</td>
<td>ecosystem functions</td>
</tr>
<tr>
<td>areas</td>
<td></td>
</tr>
</tbody>
</table>

Positive responses: 12  Negative responses: 2

% positive responses = 12/14 = .86 x 100 = 86%
does not have an environmental and natural resource policy which specifically addresses biological diversity. However, according to a 1988 report, the World Bank has assembled a taskforce to "...assess the magnitude of environmental issues of global importance and the priority that should be given to them in designing sustainable development strategies..." (World Bank 1988:1). One of these environmental issues being studied was the conservation of biodiversity. According to the report, the World Bank can best help conserve biodiversity in the course of economic development activities by identifying unique ecosystems and developing plans to protect them.

In general, the World Bank's 1986 Wildland Policy is stated in very broad terms. However the policy does state that wildland management is the best way to maintain biological diversity. In addition, World Bank planners will try to avoid converting wildlands for project purposes and seek to preserve wildlands (Ledec and Goodland 1988).

Finally, an indication of how biodiversity policy is being operationalized can be seen from an analysis of USAID project activities funded under the FY 1987 legislated earmark biodiversity funds. The earmarked funds amounted to $2.338 million which was spread over 21 projects in 14 countries. There were 7 regionally-
Table 17

USAID biodiversity activities funded under FY 1987 legislated earmarked funds

<table>
<thead>
<tr>
<th>Type of activity</th>
<th>Number of projects in which activity occurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory</td>
<td></td>
</tr>
<tr>
<td>species</td>
<td>5</td>
</tr>
<tr>
<td>habitats</td>
<td>5</td>
</tr>
<tr>
<td>Planning</td>
<td></td>
</tr>
<tr>
<td>conservation areas</td>
<td>6</td>
</tr>
<tr>
<td>biodiversity strategies</td>
<td>5</td>
</tr>
<tr>
<td>Training</td>
<td></td>
</tr>
<tr>
<td>habitat management and conservation</td>
<td>8</td>
</tr>
<tr>
<td>wildlife management</td>
<td>5</td>
</tr>
<tr>
<td>Management</td>
<td></td>
</tr>
<tr>
<td>habitats</td>
<td>6</td>
</tr>
<tr>
<td>species</td>
<td>5</td>
</tr>
<tr>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>species</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Saterson 1987

funded projects (Saterson 1987). Table 17 shows the type of activities and the number of projects in which the activity occurred.

Though not explicit in this table, it can be surmised that USAID is following Congressional intent by focusing biodiversity project activities on species and habitats, and not necessarily taking a broader view
However, assuming that species and habitats are being lost, it may be argued that any activity is better than none at all. But in terms of dollar amount, how much is being spent on biodiversity activities when compared to the total foreign aid budget? Table 18 shows USAID program trends from FY 1983 to FY 1989. The majority of funding for biodiversity activities is provided under the program activities of Agriculture, Rural Development, Nutrition and Science and Technology. As the table shows, there has been a general decline in funding for these areas.

Because USAID activities are integrated with other projects, it is impossible to tell exactly how much was spent on strictly biodiversity activities in any particular fiscal year. The only clue to this is in FY 1987 when Congress requested that USAID earmark $2.5 million solely for biodiversity projects. After budget reductions, the final amount was $2.338 million for FY 1987 and the total foreign aid budget was over $1.5 billion (functional accounts only). Thus the amount spent for biodiversity activities for FY 1987 was a little more than 0.01% of the foreign aid budget.

The amount spent on biodiversity was probably more than this, assuming projects within other functional
### Table 18

**Trends in USAID program funding from FY 1983 to FY 1989**

<table>
<thead>
<tr>
<th>categories</th>
<th>FY83</th>
<th>FY84</th>
<th>FY85</th>
<th>FY86</th>
<th>FY87</th>
<th>FY88</th>
<th>FY89</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, rural development, nutrition</td>
<td>730,317</td>
<td>723,137</td>
<td>774,742</td>
<td>759,987</td>
<td>686,933</td>
<td>471,000</td>
<td>553,800</td>
</tr>
<tr>
<td>Science and technology</td>
<td>10,000</td>
<td>9,999</td>
<td>12,000</td>
<td>15,111</td>
<td>14,662</td>
<td>14,662</td>
<td>8,662</td>
</tr>
<tr>
<td>Total of all functional accounts*</td>
<td>1,357,483</td>
<td>1,361,938</td>
<td>1,753,286</td>
<td>1,613,873</td>
<td>1,571,141</td>
<td>1,168,717</td>
<td>1,289,307</td>
</tr>
</tbody>
</table>

* Includes Agriculture, rural development, and nutrition, Population planning, Health, Child survival fund, Education and human resources development, Selected development activities, Science and technology, and Private enterprise fund. Does not include Development fund for Africa nor Economic support funds.

Source: USAID 1987, 1988, 1989
categories contained biodiversity activities. But even if the amount budgeted for biodiversity was doubled, it would still represent a small amount of the over-all foreign aid program. A more graphic way to view the amount of money USAID spends for biodiversity projects is to calculate how much is spent on a per acre of tropical forest, which, as noted elsewhere in this study, contain some of the richest collections of species in the world.

The amount of tropical rainforests in countries in which USAID operates is about 200 million acres. Spreading the $2.338 million over this acreage amounts to approximately $0.01 per acre. On the surface, this doesn't look like a lot of money per acre to conserve a resource which many NGO spokespersons as well as scientists feel is of crucial importance to the successful economic development of Third World nations and even for the survival of the world itself.

Though it appears that not much money is being spent on biodiversity activities, a number of reasons for this may be suggested. One is that U.S. foreign aid money, as well as U.S. contributions to the World Bank, must compete with other budget demands. Also, both USAID and World Bank officials do not like to allocate funds for single-purpose activities. The reason being that such allocation diminishes the
flexibility of the over-all foreign aid program by reducing USAID and World Bank ability to react quickly to changing economic situation in developing nations. Finally, the lack of flexibility means that the over-all effectiveness of the foreign aid program is diminished because many problems, such as biodiversity loss, are tied to other sectors, such as agriculture, and to be most effective, biodiversity activities must be integrated with other sectors.
CHAPTER FIVE

SUMMARY AND CONCLUSIONS

This study has traced the transformation of the concept of biological diversity into natural resource policies as implemented by bilateral and multilateral development agencies, namely the U.S. Agency for International Development (USAID) and the World Bank. Four groups were identified as playing key roles in the transformation process: the scientific community, nongovernmental environmental organizations (NGEOs), the U.S. Congress, and economic development agencies.

A conceptual model, called a Process Model, was proposed which described the process of the transformation of the biodiversity concept into natural resource policy. The first stage of the process is the definition and formulation of the scientific concept.

It was shown that within the scientific community the concept of biological diversity has many meanings and to some, no meaning at all. In general, however, biological diversity has variously been defined in terms of ecosystems, species, and genetics. For example, ecosystem diversity has been defined at the variety of ecosystems that occur within a large landscape (OTA 1987; Patrick 1983; Josephson 1982; Norse 1987).
During the second stage of the process, the scientific concept is adopted by the environmental community. Members of the environmental community formulate their own views and positions on the concept and present their views and positions to lawmakers.

In this study four nongovernmental environmental organizations (NGEOs) were seen as having adopted the biodiversity concept and being influential in the transformation process. Like the scientific community, NGEOs view biodiversity in the context of ecosystems, species, and genetics. Unlike the scientific community, NGEOs view the conservation of biodiversity in a much broader context. The NGEOs see the conservation of biological diversity as part of a strategy which encompasses Third World economic development and natural resources in general. That is, they see the conservation of all natural resources as necessary for sustained, environmentally-sound economic development. Thus NGEOs go beyond the scientific community in trying to make conservation of biodiversity relevant to Third World economic development.

The third stage of the policy transformation process is the legislative phase. Congressional hearings were held dealing with biodiversity as well as hearings on the general environmental policies of the
World Bank and other multilateral development banks. As a result of these hearings, important pieces of legislation were passed requiring U.S. Government agencies working overseas to become more aware of the consequences of their programs for conservation of biodiversity. Basic to this awareness was the Congressional request that USAID, along with other government agencies, develop a U.S. strategy on biological diversity.

The final stage of the process is policy formulation and implementation. For biodiversity legislation, two aid agencies were identified as having the largest impact on Third World economic development and the biological diversity issue. These agencies were the U.S. Agency for International Development (USAID) and the World Bank.

It was shown that USAID has a much longer history in developing and implementing environmental concerns into its economic development programs. And, for the most part, USAID's environmental policies and procedures were already in place and operational by the time biodiversity became an issue. Thus, to a large extent, USAID resisted developing a separate and specific policy for conservation of biological diversity, preferring to integrate biodiversity concerns into existing policies and programs. It
wasn't until Congress passed several pieces of legislation requiring action by USAID and other U.S. Government agencies, that USAID moved forward with respect to developing a biological diversity policy.

The development of biological diversity concern within the World Bank stands in stark contrast to that of USAID. Since Congress does not have as much control over World Bank policies as it does over USAID, Congress cannot, by law, force the World Bank to adopt policies concerning biological diversity. But because the U.S. does provide the major funding for the World Bank, the Congress does have some leverage in terms of formulation of World Bank policies. By attaching a rider to a World Bank appropriations bill, for example, Congress was able to get the World Bank to develop and implement stronger environmental polices.

The Process Model was proposed to enhance the understanding of the evolution of a scientific concept into natural resource policy. Based upon the findings of this study, a better understanding of the evolution is gained through the following changes in the Process Model.

During the first stage of the Model, the scientific community formalizes and defines the concept. Changes should note that the ideas developed about the scientific concept are subject to
peer review and that the scientific interest in the concept continues well after other groups, such as environmental groups, begin to address the concept.

Thus even though the NGEO members begin to address the biodiversity issue, the members may not reflect the changed thinking about biodiversity occurring within the scientific community.

Stage 2 of the Model suggests that the scientific concept is adopted by the environmental community. Members of the environmental community formalize views and positions about the scientific concept which are presented to lawmakers.

However, unlike the scientific community, the views and positions developed by environmentalists are not subject to critical peer review. In fact, environmentalists do not actually adopt the scientific concept, but rather develop a doctrinaire value position (e.g., biodiversity is good) with respect to the scientific concept. By doing so, environmentalists do not have to fully rationalize their interpretations of the scientific concept with those developed within the scientific community.

In this study, for example, it was shown that NGEO representatives filtered-out related ideas surrounding the biodiversity concept. For example, NGEO representatives stressed a population-community view
and thereby filtered-out the process-functional view commonly discussed by scientists. The revised Process Model is as follows:

**Process Model**

**Stage 1:** Definition and Formulation of Concept. This is an on-going process within the scientific community where work by the scientific community is subjected to peer review and criticism. Conceptual formulations are rarely fixed, but evolve to reflect changing scientific thought.

**Stage 2:** Doctrinaire value positions about the scientific concept developed by the environmental community. Unlike the scientific community, the views and positions developed by members of the environmental community are not subjected to peer review and criticism. As a result, the environmental groups never fully rationalize their interpretation of the scientific concept with that developed within the scientific community. That is, there are related ideas surrounding the scientific concept which are filtered or selected-out by environmental groups which may be vital for a better understanding of the scientific concept. The environmentalists' views and value positions are presented to lawmakers with the idea of influencing policy related to the concept. One result is that any uncertainty or ambiguity surrounding the scientific concept is never translated to lawmakers.

**Stage 3:** Legislative Phase. During this phase lawmakers listen to advocacy groups and develop legislation. Members of the scientific community may also appear before Congressional committees but do not always talk of the complexities of a scientific concept and often take an advocacy position themselves.
Stage 4: Policy Formulation and Implementation. Once the concept is translated into law, agencies become responsible for implementing legislation pertaining to the concept. The concept, which has been "filtered" by advocacy groups as well as lawmakers, must now be integrated with social and political realities. In the end, only a part of the entire scientific concept is actually translated into policy.

The revised Process Model developed from this research may be useful beyond the study of biodiversity. Further research on other resource issues should test the model for its utility in varied circumstances. If it is proven to reflect the way in which scientific concepts move into agency policy/practice, it will expand resource specialists' conceptual tool kit for understanding the transformation of scientific ideas into natural resource management.

Based upon these revisions of the Process Model and the finding of this study, a number of conclusions may be drawn. Though there has been little agreement about the concept of biodiversity within the scientific community, three broad themes have evolved. These themes are ecosystem diversity, species diversity, and genetic diversity. Despite the lack of agreement about biodiversity, scientists continue to address biodiversity issues.
Members of the NGEO community addressing the biodiversity issue selected-out certain related issues and presented an incomplete picture of biodiversity to lawmakers. As a result, biodiversity legislation was narrowly focused and this is reflected in agency funded programs to conserve biodiversity.

Beyond the conclusions supported by the findings of this study, the evolution of the biodiversity concept into natural resource policy raises a number of issues with respect to natural resource development and management. These offer fruitful topics for further research. One of these issues is the relationship between the maintenance of biodiversity and the ability of a developing country to achieve a higher standard of living as measured by such things as better health care, higher incomes, better housing, and adequate food and clothing.

Though both scientists and environmentalists have tried to make the case that economic development is dependent upon maintenance of biodiversity, none have been clearly successful. Unfortunately for the leaders of the developing nations as well as for those trying to help them, no one has specified which kind of diversity must be maintained, how much of it or where. The answers to these questions would facilitate the work of Third World economic development planners.
The inability to define these unknowns makes it even more difficult to convince Third World government leaders, whose countries are suffering under a burden of debt, that they need to conserve something in order to relieve the debt.

Another issue relates to whether organizations such as USAID and the World Bank can mount an effective policy to address the biodiversity issues. Congress, for example, has mandated that biodiversity become a new functional category in USAID's program along with already mandated categories such as agriculture, health and nutrition, and population.

USAID officials have argued, however, that if biodiversity issues cut across all functional categories, it would make more sense to address biodiversity issues within the already established ones. The establishment of new categories only diminishes the time and money available to all functional categories and, ultimately, diminishes the effectiveness of the AID program.

This leads into a final issue and perhaps the one with the most potential impact on USAID and World Bank programs. It is the relationship between the conservation of biodiversity and over-all sound environmental planning. As noted above, USAID officials make the point that biodiversity must be
addressed in all sectors of economic development planning. One way to do this is by developing environmentally-sound economic planning guidelines based upon ecological principles (Odum 1969, 1989). In this manner, not only will the conservation of biodiversity be directly addressed, but equally important, so will those elements which potentially impinge upon biological diversity. Such things, for example, as prevention of soil erosion, water quality protection, land tenure issues, and energy needs.

In a relatively short time the concept of biological diversity has been brought into natural resource policies of both governmental and nongovernmental organizations that deal with the Third World. What remains to be seen over the next decade is if these policies make any real change in the status of biological diversity, as well as contribute to the economic development of Third World nations.
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World Resources Institute. No date. Keep tropical forests alive. World Resources Institute. Wash., D.C.


APPENDICES
Content analysis procedure

Content analysis is a quantitative method for determining the "manifest content of written, spoken, or published communication" (Zito 1975:27). The techniques that comprise content analysis have been developed by sociologists, psychologists, linguists, and political scientists. The procedures used in this study is one found in standard references on content analysis (Carney 1972; Krippendorff 1980; Zito 1975).

1. Develop a proposition to be tested. For example, 'some environmentalists associate ecosystems more with the population-community view than with the functional-process view.'

2. Select a unit of analysis. Units of analysis may be such things as documents, letters, speeches, journal articles, or pages from a book.

3. Select scoring units. These units are comprised of positive and negative responses to the proposition. For example, a positive scoring unit for the above proposition might be, 'conservation of tropical rainforests ecosystems.' A negative scoring unit might be, 'the conservation of ecosystem energy paths.'

4. The sum of the positive and negative scoring units are used to complete the formula:

\[
\frac{\text{Sum of positive units}}{\text{Sum of positive plus sum of negative units}} = \text{proportion} \times 100
\]

5. If the percent positive response figure is more than 50 percent positive, the proposition cannot be rejected.
Appendix B

Organizations and agencies contacted for this study

Nongovernmental environmental organizations:

International Institute for Environment and Development
1717 Massachusetts Ave., N.W., Suite 302
Washington, D.C. 20036

Contact: Mr. Robert O. Blake
Chairman
Committee on Agricultural Sustainability
for Developing Countries

Mr. David Runnels
Director, North America

International Union for the Conservation of Nature
Ave. du Mont Blanc
Gland, Switzerland

Contact: Mr. Jeffery A. McNeely
Deputy General, Conservation

World Resources Institute
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Washington, D.C. 20006

Contact: Dr. Kenton Miller
Senior Fellow

World Wildlife Fund (U.S.)
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Washington, D.C. 20037

Contact: Ms. Kathryn Fuller
Director for Public Policy

Mr. Michael Wright
Vice-President
Other organizations and agencies:

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Washington, D.C. 20523

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Ms. Kathyrn Saterson
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Asia, Near East Bureau

Mr. Richard Silc
Office of Policy and Financial Management

Ms. Anita Stephen
Research Analyst
Policy and Program Coordination

Dr. Jack VanDeryyn
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Energy and Natural Resources

World Bank
1818 H St., N.W.
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Contact:  Dr. Robert Goodland
Ecologist
Environmental Department

Dr. Stephen Lintner
Senior Environmental Specialist
Europe, Middle East and North America
Appendix C

Nongovernmental environmental organizations concerned with biological diversity

<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>SERVICES</th>
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<td>Center for Environmental Education</td>
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<td>Natural Resources Defense Council</td>
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ORGANIZATION

Nature Conservancy International
1800 North Kent St. Suite 800
Arlington, VA 22209

Rainforest Action Network
466 Green St., Suite 300
San Francisco, CA 94122

Sierra Club
Information Services
730 Polk St.
San Francisco, CA 94009

Threshold
1845 Calvert St., N.W.
Washington, D.C. 20009

World Resources Institute
1735 New York Ave., N.W.
Washington, D.C. 20006

World Wildlife Fund/Conservation Foundation
1255 23rd St., N.W.
Washington, D.C. 20037

SERVICES

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Services:

1. Slide shows
2. Posters
3. Speakers
4. Issue updates, newsletters
5. Classroom materials
6. Membership programs
7. Field projects
8. Detailed technical information
9. Responsible investment information
10. Tourism, trips in tropical countries
11. Consumer product information

Source: World Resources Institute, no date
Appendix D

1983 Foreign Assistance Act Amendment
International Environmental Protection Act

TITLE VII—INTERNATIONAL ENVIRONMENTAL PROTECTION

SHORT TITLE

Sec. 701. This title may be cited as the "International Environment Protection Act of 1983".

ENDANGERED SPECIES

Sec. 702. Chapter 1 of part I of the Foreign Assistance Act of 1961 is amended by inserting immediately after section 118 (22 U.S.C. 2151p) the following new section:

"Sec. 119. ENDANGERED SPECIES.—(a) The Congress finds the survival of many animal and plant species is endangered by over-hunting, by the presence of toxic chemicals in water, air and soil, and by the destruction of habitats. The Congress further finds that the extinction of animal and plant species is an irreparable loss with potentially serious environmental and economic consequences for developing and developed countries alike. Accordingly, the preservation of animal and plant species through the regulation of the hunting and trade in endangered species, through limitations on the pollution of natural ecosystems, and through the protection of wildlife habitats should be an important objective of the United States development assistance.

In order to preserve biological diversity, the President is authorized to furnish assistance under this part to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalog animal and plant species, especially in tropical environments.

(c) The Administrator of the Agency for International Development, in conjunction with the Secretary of State, the Secretary of the Interior, the Administrator of the Environmental Protection Agency, the Chairman of the Council on Environmental Quality, and the heads of other appropriate Government agencies, shall develop a United States strategy, including specific policies and programs, to protect and conserve biological diversity in developing countries.

(d) Each annual report required by section 634(a) of this Act shall include, in a separate volume, a report on the implementation of this subsection. Not later than one year after the date of enactment of this section, the President shall submit a comprehensive report to the Speaker of the House of Representatives and the chairman of the Committee on Foreign Relations of the Senate on the United States strategy to protect and conserve biological diversity in developing countries."
ENVIRONMENTAL EXCHANGES

Sec. 703. (a) Section 102(b) of the Mutual Educational and Cultural Exchange Act of 1961 (22 U.S.C. 2452(b)) is amended—

(1) by striking out "and" at the end of paragraph (9);
(2) by striking out the period at the end of paragraph (10) and inserting in lieu thereof "; and"; and
(3) by adding the following after paragraph (10):

"(11) interchanges and visits between the United States and other countries of scientists, scholars, leaders, and other experts in the fields of environmental science and environmental management.".

(b) Of the amount by which expenditures for the Fulbright Academic Exchange Programs, for the Humphrey Fellowship Program, and for the International Visitor Program for each of the fiscal years 1984 and 1985 exceeds the expenditures for these programs in fiscal year 1982, 5 per centum shall be used to finance programs authorized by the amendment made by subsection (a) of this section.

INTERNATIONAL WILDLIFE RESOURCES CONSERVATION

Sec. 704. (a) The Secretary of State and the Secretary of the Interior, in consultation with the heads of other concerned Federal agencies, shall undertake a review of the effectiveness of existing United States international activities relating to the conservation of international wildlife resources and shall develop recommendations to substantially improve existing capabilities. On the basis of this review, the Secretary of State and the Secretary of the Interior shall, within six months after the date of enactment of this Act, transmit to chairman of the Committee on Foreign Relations of the Senate and to the chairman of the Committee on Foreign Affairs of the House of Representatives a report—

(1) describing the programs of all Federal agencies concerned with international wildlife resources conservation programs;
(2) recommending an integrated United States plan of action to assist foreign governments and international organizations in conserving wildlife, taking into account the projections in the Global 2000 study;
(3) analyzing the extent to which the Department of State and other relevant Federal agencies are currently involved in—

(A) the establishment of effective liaison with international, national, and local governmental and nongovernmental agencies, organizations, and persons involved in or knowledgeable of wildlife resources conservation abroad;
(B) the provision of expert international wildlife resources conservation staff assistance and advice to United States Embassies, Agency for International Development missions, United States overseas military installations, and other United States governmental or private interests;
(C) facilitating the provision of advice or assistance to governments, agencies, or organizations which wish to enhance their wildlife resources conservation capabilities abroad;
(D) the acquisition and dissemination of reliable data or information concerning—

(i) the conservation status of species of wild fauna and flora;
(ii) the conservation status of lands and waters upon which wild fauna and flora depend;
(iii) existing or proposed laws, proclamations, statutes, orders, regulations, or policies which pertain to the taking, collecting, import, or export of wildlife resources, or to other aspects of international wildlife resources conservation;
(iv) the potential impact upon wildlife resources abroad of actions authorized, funded, or carried out by the United States Government; and

(v) opportunities to initiate or enhance the efficiency of international wildlife resources conservation by the transfer of United States expertise through technical assistance, training, exchange of publications, or other means;

(E) maintaining liaison, for the purposes of providing information needed to make sound conservation decisions, with persons responsible for implementing actions abroad which are authorized, funded, or carried out by Federal agencies or other persons under the jurisdiction of the United States; and

(F) the performance of any other activities which may be relevant to the United States obligations, authorities, or interests in the field of international wildlife resources conservation;

(4) recommending steps which could be taken to increase the capabilities of the Department of State and other relevant Federal agencies in carrying out the functions described in paragraph (3), including estimates of the costs of taking those steps and estimates of the personnel required to increase those capabilities; and

(5) analyzing the desirability of delineating geographic regions abroad (which would be known as “International Wildlife Resources Conservation Regions”) and assigning qualified members of the Foreign Service to be responsible for wildlife resource conservation issues in those regions.
Protecting Tropical Forests and Biological Diversity in Developing Countries.

TITLE III—PROTECTING TROPICAL FORESTS AND BIOLOGICAL DIVERSITY IN DEVELOPING COUNTRIES

SEC. 301. PROTECTING TROPICAL FORESTS.
Chapter 1 of part I of the Foreign Assistance Act of 1961 is amended—

(1) by redesignating section 118 as section 117;
(2) by striking out subsection (d) of that section; and
(3) by inserting after that section the following new section 118:

"SEC. 118. TROPICAL FORESTS.
"(a) IMPORTANCE OF FORESTS AND TREE COVER.—In enacting section 103(b)(3) of this Act the Congress recognized the importance of forests and tree cover to the developing countries. The Congress is particularly concerned about the continuing and accelerating alteration, destruction, and loss of tropical forests in developing countries, which pose a serious threat to development and the environment. Tropical forest destruction and loss—
"(1) result in shortages of wood, especially wood for fuel; loss of biologically productive wetlands; siltation of lakes, reservoirs, and irrigation systems; floods; destruction of indigenous peoples; extinction of plant and animal species; reduced capacity for food production; and loss of genetic resources; and
"(2) can result in desertification and destabilization of the earth's climate.

Properly managed tropical forests provide a sustained flow of resources essential to the economic growth of developing countries, as well as genetic resources of value to developed and developing countries alike.

(b) PRIORITIES.—The concerns expressed in subsection (a) and the recommendations of the United States Interagency Task Force on Tropical Forests shall be given high priority by the President—
"(1) in formulating and carrying out programs and policies with respect to developing countries, including those relating to bilateral and multilateral assistance and those relating to private sector activities; and
"(2) in seeking opportunities to coordinate public and private development and investment activities which affect forests in developing countries.

(c) ASSISTANCE TO DEVELOPING COUNTRIES.—In providing assistance to developing countries, the President shall do the following:
"(1) Place a high priority on conservation and sustainable management of tropical forests.
"(2) To the fullest extent feasible, engage in dialogues and exchanges of information with recipient countries—
"(A) which stress the importance of conserving and sustainably managing forest resources for the long-term economic benefit of those countries, as well as the irreversible losses associated with forest destruction, and

"(B) which identify and focus on policies of those countries which directly or indirectly contribute to deforestation.

"(3) To the fullest extent feasible, support projects and activities—

"(A) which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and

"(B) which help developing countries identify and implement alternatives to colonizing forested areas.

"(4) To the fullest extent feasible, support training programs, educational efforts, and the establishment or strengthening of institutions which increase the capacity of developing countries to formulate forest policies, engage in relevant land-use planning, and otherwise improve the management of their forests.

"(5) To the fullest extent feasible, help end destructive slash-and-burn agriculture by supporting stable and productive farming practices in areas already cleared or degraded and on lands which inevitably will be settled, with special emphasis on demonstrating the feasibility of agroforestry and other techniques which use technologies and methods suited to the local environment and traditional agricultural techniques and feature close consultation with and involvement of local people.

"(6) To the fullest extent feasible, help conserve forests which have not yet been degraded, by helping to increase production on lands already cleared or degraded through support of reforestation, fuelwood, and other sustainable forestry projects and practices, making sure that local people are involved at all stages of project design and implementation.

"(7) To the fullest extent feasible, support projects and other activities to conserve forested watersheds and rehabilitate those which have been deforested, making sure that local people are involved at all stages of project design and implementation.

"(8) To the fullest extent feasible, support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing, including reforestation, soil conservation, and other activities to rehabilitate degraded forest lands.

"(9) To the fullest extent feasible, support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation, including research in agroforestry, sustainable management of natural forests, small-scale farms and gardens, small-scale animal husbandry, wider application of adopted traditional practices, and suitable crops and crop combinations.

"(10) To the fullest extent feasible, conserve biological diversity in forest areas by—
"(A) supporting and cooperating with United States Government agencies, other donors (both bilateral and multilateral), and other appropriate governmental, intergovernmental, and nongovernmental organizations in efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis;

"(B) whenever appropriate, making the establishment of protected areas a condition of support for activities involving forest clearance or degradation; and

"(C) helping developing countries identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas.

"(11) To the fullest extent feasible, engage in efforts to increase the awareness of United States Government agencies and other donors, both bilateral and multilateral, of the immediate and long-term value of tropical forests.

"(12) To the fullest extent feasible, utilize the resources and abilities of all relevant United States Government agencies.

"(13) Require that any program or project under this chapter significantly affecting tropical forests (including projects involving the planting of exotic plant species)—

"(A) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and

"(B) take full account of the environmental impacts of the proposed activities on biological diversity,

as provided for in the environmental procedures of the Agency for International Development.

"(14) Deny assistance under this chapter for—

"(A) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner which minimizes forest destruction and that the proposed activity will produce positive economic benefits and sustainable forest management systems; and

"(B) actions which significantly degrade national parks or similar protected areas which contain tropical forests or introduce exotic plants or animals into such areas.

"(15) Deny assistance under this chapter for the following activities unless an environmental assessment indicates that the proposed activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development:

"(A) Activities which would result in the conversion of forest lands to the rearing of livestock.

"(B) The construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands.

"(C) The colonization of forest lands.

"(D) The construction of dams or other water control structures which flood relatively undegraded forest lands.
"(d) PVOs and Other Nongovernmental Organizations.—Whenever feasible, the President shall accomplish the objectives of this section through projects managed by private and voluntary organizations or international, regional, or national nongovernmental organizations which are active in the region or country where the project is located.

"(e) Country Analysis Requirements.—Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of—

"(1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests, and

"(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

"(f) Annual Report.—Each annual report required by section 634(a) of this Act shall include a report on the implementation of this section."

SEC. 302. PROTECTING BIOLOGICAL DIVERSITY.

Section 119 of the Foreign Assistance Act of 1961 is amended by striking out subsections (c) and (d) and inserting in lieu thereof the following:

"(c) Funding Level.—For fiscal year 1987, not less than $2,500,000 of the funds available to carry out this part (excluding funds made available to carry out section 104(c)(2), relating to the Child Survival Fund) shall be allocated for assistance pursuant to subsection (b) for activities which were not funded prior to fiscal year 1987. In addition, the Agency for International Development shall, to the fullest extent possible, continue and increase assistance pursuant to subsection (b) for activities for which assistance was provided in fiscal years prior to fiscal year 1987.

"(d) Country Analysis Requirements.—Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of—

"(1) the actions necessary in that country to conserve biological diversity, and

"(2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

"(e) Local Involvement.—To the fullest extent possible, projects supported under this section shall include close consultation with and involvement of local people at all stages of design and implementation.

"(f) PVOs and Other Nongovernmental Organizations. Whenever feasible, the objectives of this section shall be accomplished through projects managed by appropriate private and voluntary organizations, or international, regional, or national nongovernmental organizations, which are active in the region or country where the project is located.
"(g) **Actions by AID.**—The Administrator of the Agency for International Development shall—

"(1) cooperate with appropriate international organizations, both governmental and nongovernmental;

"(2) look to the World Conservation Strategy as an overall guide for actions to conserve biological diversity;

"(3) engage in dialogues and exchanges of information with recipient countries which stress the importance of conserving biological diversity for the long-term economic benefit of those countries and which identify and focus on policies of those countries which directly or indirectly contribute to loss of biological diversity;

"(4) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity;

"(5) whenever possible, enter into long-term agreements in which the recipient country agrees to protect ecosystems or other wildlife habitats recommended for protection by relevant governmental or nongovernmental organizations or as a result of activities undertaken pursuant to paragraph (6), and the United States agrees to provide, subject to obtaining the necessary appropriations, additional assistance necessary for the establishment and maintenance of such protected areas;

"(6) support, as necessary and in cooperation with the appropriate governmental and nongovernmental organizations, efforts to identify and survey ecosystems in recipient countries worthy of protection;

"(7) cooperate with and support the relevant efforts of other agencies of the United States Government, including the United States Fish and Wildlife Service, the National Park Service, the Forest Service, and the Peace Corps;

"(8) review the Agency's environmental regulations and revise them as necessary to ensure that ongoing and proposed actions by the Agency do not inadvertently endanger wildlife species or their critical habitats, harm protected areas, or have other adverse impacts on biological diversity (and shall report to the Congress within a year after the date of enactment of this paragraph on the actions taken pursuant to this paragraph);

"(9) ensure that environmental profiles sponsored by the Agency include information needed for conservation of biological diversity; and

"(10) deny any direct or indirect assistance under this chapter for actions which significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas.

"(h) **Annual Reports.**—Each annual report required by section 634(a) of this Act shall include, in a separate volume, a report on the implementation of this section."
Appendix F

USAID's criteria for reviewing biological diversity projects

Administrative Criteria:

1. Does the project meet the requirements of Section 119?

2. What is the level of mission or Embassy concurrence or willingness to cooperate and contribute money?

3. What is the level of host-country and/or NGO, PVO interest and willingness to cooperate?

4. Is there an existing mechanism (institutional relationship) for initiating conservation programs and will the project or activity tie in with existing programs?

5. Will the project maximize the amount of money that actually gets into the field by maximizing matching funds through indigenous NGOs and U.S. counterparts and by minimizing overhead costs?

6. Will the activity relate effectively to the economic development objectives of the country and to an increase in public understanding?

7. Is the project financially and institutionally sustainable?

Ecological Criteria:

1. What is the degree of human threat to species and habitat richness, and the intrinsic vulnerability of the species and habitat in the area, i.e. particularly fragile ecosystem?

2. What is the level of species endemism and habitat richness within the country or target area?
3. How important is the habitat for maintaining species diversity in other regions, i.e. seasonal habitats serving as breeding sites for migratory species?

4. How important is the natural ecosystem to the human needs of a given country?

5. Is the project sustainable?

6. Is the distribution of projects balanced among a variety of ecosystems in different geographic areas?

Source: USAID 1988: 109-110
Appendix G

1985 Appropriations Bill, Sec. 540

PUBLIC LAW 99-190 [H.J. Res. 465], December 19, 1985

FURTHER CONTINUING APPROPRIATIONS, 1985
Sec. 540. (a) The Secretary of the Treasury shall instruct the United States Executive Directors of the Multilateral Development Banks to—

(1) vigorously promote a commitment of these institutions to add or strengthen professionally trained staff to undertake environmental review of projects; or have development management plans to substantially increase the environmentally trained staff engaged in review of the ecological impacts of prospective projects;

(2) vigorously promote changes in these institutions in their preparation of projects and country programs that will encourage staff and borrower countries to—

(A) actively and regularly involve environmental and health ministers, or comparable representatives, in the preparation of environmentally sensitive projects and in bank-supported country program planning and strategy sessions;

(B) actively and regularly use the resources of available nongovernmental conservation and indigenous peoples' organizations, and consistent with international procurement policies, in the preparation of environmentally sensitive projects and in bank-supported country program planning and strategy sessions;

(3) vigorously promote a commitment of these institutions to increase the proportion of their lending programs supporting environmentally beneficial projects and project components, resource rehabilitation projects and project components, protection of indigenous peoples, and appropriate or light capital technology projects. Examples of such projects include small scale mixed farming and multiple cropping; agroforestry; programs to promote kitchen gardens; watershed management and rehabilitation; high yield woodlots; integrated pest management systems, dune stabilization programs, programs to improve energy efficiency; energy efficient technologies such as small scale hydro projects, rural solar energy systems, and rural and mobil telecommunications systems; and improved efficiency and management of irrigation systems;
(4) vigorously promote the establishment within the Economic Development Institute of the World Bank to institute a component which provides training in environmental and natural resource planning and program development;

(5) ensure that there is a thorough evaluation within the U.S. Government of the potential environmental problems, and the adequacy of measures to address these problems, associated with all proposed loans for projects involving large impoundments of rivers in tropical countries; penetration roads into relatively undeveloped areas; and agricultural and rural development programs; the potential environmental problems to be addressed in such evaluations shall include those relating to deterioration of water quality, siltation, spread of water borne diseases, forced resettlement, deforestation, threats to the land, health and culture of indigenous peoples, top soil management, water logging and salinization in irrigation projects, and pesticide misuse and resistance;

(6) call for, by May 31, 1986, separate and special meetings of each of the Boards of Executive Directors of these institutions to discuss their environmental performance, and ways in which this performance can be improved, including alternative projects considered and alternative configurations of projects with specific attention to environmental problems associated with the following categories of projects: large impoundments of rivers in tropical countries; penetration roads into relatively undeveloped areas; agriculture and rural development projects; and

(7) in preparation for the meetings referred to in clause (6), the United States Executive Directors of the Multilateral Development Banks shall request the preparation of reviews by the International Bank for Reconstruction and Development and the Inter-American Development Bank from available information, of their environmental performance over the past decade with respect to the categories of projects referred to in clause (6); the United States Executive Directors shall request that these reviews specifically discuss the environmental problems explicitly referred to in clause (5).

(b) The Secretary of the Treasury shall prepare and submit to the Committees on Appropriations by March 31, 1986, a report documenting the progress the Multilateral Development Banks have made in implementing the environmental reform measures described in clauses (1) through (4) of subsection (a).

(c) The Secretary of the Treasury and the Secretary of State shall undertake initiatives, in addition to those described in clause (6) of subsection (a) to discuss measures to improve the environmental performance of the Multilateral Development Banks with the representatives, and with the ministries from which they receive their instructions, of other donor nations to these institutions.

(d) In the report of the Secretary of the Treasury required by subsection (b) regarding the implementation of staffing measures suggested in clause (1) of subsection (a), the Secretary of the Treasury shall specifically discuss the International Bank for Reconstruction and Development's progress in adding environmentally trained professionals, or in developing and implementing alternative plans for environmental staffing in each of the Bank's six regional offices to review projects for their prospective ecological impacts.

99 STAT. 1310
Appendix H

U.S. Congressional Draft Recommendations regarding environmental concerns associated with multilateral development bank activities

1. A representative from the Council on Environmental Quality or, alternatively, from the State Department's Bureau of Oceans and International Environment and Scientific Affairs, should be designated as a member of the Working Group on Multilateral Affairs.

2. A permanent Treasury Department staff position should be established within the Office Multilateral Development Banks to monitor environmental aspects of bank activities, to facilitate constructive U.S. involvement in assuring that sound environmental policies are implemented by multilateral lending agencies supported by the U.S., and to expedite the flow of information between the banks and the U.S. Congress, other relevant federal agencies and the public regarding environmental considerations.

3. Within the Inter-American Development Bank, a staff position should be established to serve as the environmental coordinator for bank activities.

4. An environmental coordinator position should be established at the African Development Bank.

5. A staff member of each of the World Bank's six regional offices should be assigned full time responsibility for environmental issues.

6. The Economic Development Institute of the World Bank should be expanded with the addition of a component which provides training in environmental and natural resource planning and program development.

7. A renewed effort should be made through the Committee of International Development Institutions on the Environment to obtain joint support for creation of the Economic Development Institute environmental component, making courses available to all participating institutions.
8. Each of the multilateral development banks should do its utmost to foster expanded environmental awareness in recipient and member countries.

9. The development banks should, whenever possible, contract with conservation NGOs to provide their services during pre-project planning and during project implementation phases for purposes of local information gathering and dissemination so as to achieve maximum local input and participation in the assessment of planning for projects.

10. Each of the multilateral development banks should press their borrower countries to actively involve environment and/or health ministers or comparable representatives in bank-supported country program planning and strategy sessions.

11. In accordance with Title VIII of the International Financial Institutions Act of 1977, appropriate or light capital technology should be incorporated, to the maximum extent possible, into bank project operations.

12. Country program planning and strategy activities of each of the development banks should reflect and conform to the 1980 World Conservation Strategy.

13. The Declaration of Environmental Policies and Procedures Relating to Economic Development complements the World Conservation Strategy. The signatories to the Declarations should adhere to the guidance which the Declaration provides.

14. There are a number of criteria which should be applied by the U.S. Executive Directors for the World Bank and regional banks to determine whether environmental considerations should impel the United States to work for changes to project proposals or, failing this, to opposed projects when they come before each organizations' Executive Directors. Some of these criteria include: projects which harvest renewable resources in a nonsustainable manner; threaten to cause species extinction; cause environmental degradation beyond country boundaries; etc.
15. The U.S. Executive Directors should exert a leadership role in each of the multilateral lending institutions to promote a strong and effective environmental program.

16. The Department of the Treasury should prepare annual reports to Congress presenting the activities of the multilateral banks regarding environmental impacts and environmental protection.