PN-AAM-934

ISN 29471

LEGAL, REGULATORY, AND INSTITUTIONAL ASPECTS OF ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT IN DEVELOPING COUNTRIES

Produced Under the
AID/NPS Natural Resources Project

NOVEMBER 1981

FORESTRY, ENVIRONMENT & NATURAL RESOURCES
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

INTERNATIONAL AFFAIRS
NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

U.S.A.

LEGAL REGULATORY AND INSTITUTIONAL ASPECTS OF ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT IN DEVELOPING COUNTRIES

TABLE OF CONTENTS

INTRODUCTION vi

PREFACE xi

SECTION ONE

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT ISSUES IN DEVELOPING COUNTRIES

Chapter

I Historical Perspective 1

A. The Stockholm Conference of 1972 1

B. The Post-Stockholm Surge of Activities 3

C. More Recent Activities at the International Level 5

Footnotes 8

Additional Reading 13

II Environmental and Natural Resource Management Problems in Developing Countries 14

A. Population Size Growth and Distribution 14

B. Agricultural Practices 15

C. Deforestation 20

D. Water, Sanitation and Environmental Health 21

E. Overexploitation of Fisheries and Wildlife Resources 24

F. Pollution 27

G. Conclusion 27

Footnotes 30

Additional Reading 36

Chapter		page
III	Management Policies: Present Approaches, Difficulties and Objectives	37
	A. Present Approaches	37
	B. Evaluation of Current Approaches	39
	C. National Environmental Policies and the World Conservation Strategy	41
	D. Definitional Problems	42
	E. The Goal: Environmentally Integrated Development	46
	Footnotes	49

SECTION TWO

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT CAPACITY IN DEVELOPING COUNTRIES LESSONS FROM FOUR CASE STUDIES

IV	Frameworks for Management	53
	A. Role of Institutions for Improving Environmental and Natural Resource Management Capacity	54
	B. Institutional Arrangements for Environmental Management (or Environmentally Integrated Development	58
	1. GHANA: The Advisory Approach to Environmental Integration	58
	2. MALAYSIA: A Regulatory Environmental Agency in a Federal System of Government	68
	3. SUDAN: An Existing Ministry Assumes Environmental Responsibilities	78
	4. VENEZUELA: Ministerial Level Management with an Executive Environmental Agency	86

Chapter		page
IV (cont)	C. Anticipatory Measures for Environmental Management Including Impact Assessment	91
	1. Ghana	94
	2. Malaysia	96
	3. Sudan	98
	4. Venezuela	99
	General Comments	100
	D. Conclusion	102
	Footnotes	105
	Additional Reading	116
V.	Legal and Regulatory Aspects of Environmental Management	117
	A. The Role of Law	117
	B. Legal Aspects of Environmental Management-Current Approach	119
	1. Ghana	119
	2. Malaysia	122
	3. Sudan	125
	4. Venezuela	128
	General Conclusions	131
	Footnotes	134
	Additional Reading	140

SECTION THREE

ENVIRONMENTAL MANAGEMENT NEEDS AND STRATEGIES

Chapter		page
VI	Environmental Management Needs: Constraints and Opportunities	141
	A. Adequate Information Base	143
	B. Constitutional and Jurisdictional Problems - Competing Bureaucracies	146
	C. Public Participation	149
	D. Legislative Policy and the Role of Law	152
	E. Manpower Resources, External Disincentives and Training	156
	F. Traditional Resource Management Systems	159
	Conclusion	160
	Footnotes	162
VII	Approaches to Environmental Management in Different Developing Countries	166
	A. Integrated Development for Sustainability in the Poorer Developing Countries	167
	B. Proposed Steps to Improving Environmental Management in the Poorer Developing Countries - A Sector-Specific Approach	169
	1. Policy	173
	2. Institutional Strengthening - Stock Taking	174
	3. Environmental Legislation	175
	C. Environmental Management Concerns in the Middle-Income Developing Countries	178

Chapter | page

VII (cont)

D. Environmental Management Priorities for the Middle-Income Developing Countries: Developing Schemes as a Basis for an Integrated Approach to Sustainable Development 181

1. Improved Project and Regional Analysis 184

2. Increased Budgets and Career Staff 184

3. Strengthening Indigenous Environmental Expertise 185

4. Increasing Public Awareness 186

Conclusion 186

Footnotes 187

Appendices

Appendix I: Further Reading 188

Appendix II: List of Some Key Governmental Institutions with Environmental Responsibility in Developing Countries 203

Appendix III: List of People and Organizations Contacted 209

Appendix IV: Subjects Which Require Further Research 218

LEGAL REGULATORY AND INSTITUTIONAL ASPECTS OF ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT IN DEVELOPING COUNTRIES

INTRODUCTION

This project is a component of a larger U.S. AID/NPS (National Park Service) information-gathering and generation program entitled "Environment and Natural Resources: Expanded Information Base." The overall objective of this program, a summary of which is attached, is to identify methods that will assist developing countries in improving their capability to conserve and manage their natural resources and to protect their environments.

The IIED legal and institutional review project was conducted with the cooperative assistance and collaboration of the large group of people and organizations listed in Appendix III. In addition, initial guidance on the project methodology was granted by a group of international experts in environmental management who participated in a workshop which was convened by the IIED in July 1980. This workshop was instrumental in:

--defining the objectives and parameters of the study

--reviewing the methodology for the implementation of the project

--finalizing country selection

--adopting an outline for the legal/institutional reports on each selected country.

It was decided at this workshop that country selection should be guided by the following criteria:

--Reasonable experience in environmental and natural resources management (in order to avoid putting pressure on newly established systems);

--Representation of a range of existing approaches in the legal and institutional area for environmental and natural resources management;

--Representation of different legal and political systems;

--Availability of, and accessibility to, expert contacts in these countries (to assure maximum collaboration with experts in the field);

--Representation of different levels of economic development;

--Availability of information and data in Washington to facilitate background work, and to a lesser extent;

--Geographic representation;

--Representation of a range of environmental and natural resource management problems.

Based on these criteria the project staff selected the four study countries used as case studies from which the bulk of the final report was extrapolated.

The major project activity after country selection involved the identification and review of published information on each country's environment, and environment-related institutions. Principal sources of information were: the U.S. Library of Congress; the World Bank; U.S. AID; the Food and Agriculture Organization of the UN (FAO), in particular the Legal Office; the U.N. Environment Programme (UNEP); the World Health Organization (WHO); and the IUCN Law Center. Other information sources are listed in Appendix IV.

Following this preliminary research, field visits were made to the selected countries: The Sudan (October, 1980), Ghana (November, 1980), Venezuela (November/December, 1980), and Malaysia (March, 1981). These visits focussed on the operations of relevant institutions and laws and the practical constraints on their effectiveness. In particular, the insights of both government officials and private individuals on the strengths and weaknesses of the relevant management systems were actively sought. These field visits also provided an opportunity to work with local experts in government service, non-governmental organizations and university groups. And while much of this report is basd upon literature available in Washington concerning environmental institutions in the developing world in general, of necessity most of the specific observations and comments relate to the four study countries where data was verified in the field.

The draft country reports were returned to the study countries for comment. To date, only Ghana has responded. As soon as comments are received from the other three countries, the draft reports will be edited and made available through U.S. AID for interested readers.

In addition, attention was focussed on reviewing the existing literature in order to identify information gaps. The purpose of this review was to better assess those areas needing further concentration in terms of in-depth case studies on problem sectors - identified as the next phase of the overall U.S. AID/NPS Expanded Information Base Program.

NPS/AID Project

In August 1979 the National Park Service entered into a four-year agreement with the Agency for International Development to assist AID in the area of natural resource management and environmental protection. The project is designed to review existing technical information on environmental protection and natural resource management and to organize it in a manner that AID missions and developing countries can use for project planning and execution.

The objective of the project is to develop within AID missions and host country governments a capability to plan and carry out natural resource management and conservation programmes. A wide range of natural resource information will be identified, organized, and refined by specialists in the federal government, universities, and private organizations under the direction of the National Park Service.

There are three sequential components to the project which will be related in subject matter to produce increasingly detailed levels of information.

PHASE ONE — Review Papers - are designed to assess the state-of-the-art on selected environmental and natural resource issues in developing countries.

PHASE TWO — Case Studies - will be undertaken in cooperation with a host country institution to document the different approaches to regional resource planning.

PHASE THREE Design Aids - will emphasize methods for identifying development opportunities within the context of a riverbasin, watershed, or other geographic system.

Information transfer and dissemination will be conducted throughout the life of the project through the use of technical bulletins, special edition publications, regional workshops, audio/visual aids, translations, and other means. Information transfer and dissemination is intended to introduce AID missions and host countries to the findings of the review papers, case studies, and project design aids in a gradual, phased manner. Information will be directed to specific audiences that can be used to design environmentally sound projects and deal with important conservation issues.

PREFACE

This report reviews the evolution and some of the different approaches to systems (policies, institutions and laws) in developing countries. The bulk of the report is extrapolated from the findings of research conducted in four countries - Ghana, Malaysia, the Sudan and Venezuela - during the life of the project.* However, the purpose of this report is not to summarize these country reports. Instead, by analyzing archetypical institutional and legal mechanisms for environmental management that are represented in these countries, the report attempts to define a pragmatic approach to improving environmental management. It is hoped that this approach may be useful to the development community - both developing country decision-makers, and development assistance agencies and institutions.

When dealing with such a vast, heterogenous area as the Third World (consisting of over a hundred sovereign political states, with extreme variety in levels of economic development, cultural and physical characteristics) enormous difficulties exist in attempting to extract enough commmon lessons in order to make relevant observations and to propose specific recommendations. Perhaps the greatest danger is the risk of over generalizing. Nevertheless, there are reasons that make such an attempt worthwhile. First, despite various noteworthy efforts by the development community at environmental redemption,

* The individual country reports will be available for general distribution once comments have been received from the project's collaborators in these countries.

recent reports (particularly the Global 2000 report and the IUCN's World Conservation Strategy) highlight not only the magnitude and complex nature of the task of environmental management but the fact that in many countries the elements of environmental management are still relatively new. Thus, the need to share information, especially on the strengths and weaknesses of selected management systems, is acute. Second, providing information on current approaches to environmental and resource management is valuable because many environmental and resource management problems do not know or respect any political boundries. For developing countries in particular, the negative and positive impacts of environmental concerns on economies have not been sufficiently examined. One of the findings during the course of this study is that while the countries are different, the range of environmental and natural resources management problems are similar. Further, there are wide variations in the approaches to management and management needs. Thus, the most practical approach to the preparation of this report appears to be a grouping of recommendations (see Chapter 7) into two broad categories. One category focusses upon the environmental management priorities for the developing countries that are very poor and where severe financial and balance of payments problems limit the capacity for environmental management, and where human resources and skilled manpower are scarce. The second category will be the better-off developing countries which have ampler resources, whether in manpower, infrastructure or finance. However, having made this distinction, it is important to note that these two categories are not water-tight compartments. It is entirely feasible for one country to have characteristics, whether nationally or in some of its regions, which could put it in either category.

While the environmental management effort in all countries should be geared toward the attainment of the same goal - an across the board drive for rational utilization of natural resources and the prevention of pollution - there must be and are variations in focus and priority. It is to these variations that this report draws attention. This approach was adopted mainly because it is relatively easier as well as logical for development decision-makers (both in developing and developed countries) to draw parallels from countries with comparable levels of economic, infrastructural and manpower development.

During the course of this project the IIED project staff has had the opportunity to collaborate with a fairly large group of people and organizations, most of whom appear in Appendix IV. We wish to acknowledge in particular the assistance of the following:

National Park Service (Office of International Park Affairs)

Robert C. Milne
Hugh B. Muller
Ken Thelen
Jeffrey B. Tschirley

AID

Bessie Boyd
James Hester
Molly Kux
Stephen Lintner
Robert Otto
Albert Printz
Jane Stanley

Others

Anwar Abdu (Clark University, Department of Geography)
Edward Ayensu (Smithsonian Institution)
Fred Bauman (Library of Congress, Science and Technology Division)
James Corson (U.S. MAB Program)
Robert Goodland (World Bank, Office of Environmental Affairs)
George Francis (Department of Man-Environment Studies, University of Waterloo, Canada)
Peter Freeman (Environmental Affairs Officer, Dakar, Senegal)
Arthur Hanson (Institute for Resource and Environmental Studies, Dalhousie University, Canada)
Peter Hazlewood (Library of Congress, Science and Technology Division)
Barbara Lausche (OTA)
Ralph Luken (CEQ)
Regis F. Maubrey (World Bank, Office of Environmental Affairs)
James Paul (International Center for Law in Development)
Priscilla Reining (AAAS)
Kirk Rodgers (OAS)
Richard Saunier (OAS)
Jeff Shane (Assistant General Council for International Law, D.U.T.)
James J. Talbot (NAS)

Our particular thanks are due to Dr. Jorge Hardoy, a Senior Fellow of IIED and of the Centro de Estudios Urbanos y Regionales, (CEUR) Buenos Aires, and Beatriz Cuenya of CEUR who prepared the report on Venezuela and were tirelessly helpful in responding to our questions.

Others who gave generously of their time and knowledge in preparing the country reports were Dr. Omar Al Agraa of the Department of Architecture, University of Khartoum (an IIED Fellow), and the officials of the EPC in Ghana and the DOE in Malaysia.

Henry Gruppe

Brian Johnson

Waafas Ofosu-Amaah

November 1981

SECTION ONE - ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT ISSUES IN DEVELOPING COUNTRIES

...A concise evaluation of the Stockholm Conference on the Human Environment. A record of events which took place after that Conference including the Declaration of Environmental Policies and Procedures Relating to Economic Development signed by the multilateral donor agencies, and the issuance of the World Conservation Strategy...

CHAPTER I

HISTORICAL PERSPECTIVE

A. The Stockholm Conference of 1972

Worldwide concern over the issues to be dealt with in this report had its origins in the 1972 United Nations Conference on the Human Environment (Stockholm Conference). The initial reaction of the bulk of the 113 nations which participated in the Conference was one of suspicion and apprehension - suspicion that the Conference would devote itself almost exclusively to the narrow, special interests (mainly pollution control) of a small group of highly industrialized, western countries; apprehension that the developed countries' preoccupation with environmental matters would entail dire consequences for both international trade and development.

It is true that initial support for the Conference came from those developed countries which viewed the industrial pollution which accompanies development as a pressing issue. The developing countries on the other hand felt that their environmental problems arose from "poverty and the very lack of development"[1] in their societies. These differences in perception were sufficiently deep-rooted for the Secretary-General of the Conference[2] to feel obliged to convene a panel of experts on

development and environment (at Founex, Switzerland) to examine these issues and to make proposals for the Conference. The Founex meeting marked the first time that environmental aspects of Third World development had been dealt with in detail by both developed and developing countries together. By the time it was over, the issues had crystalized around three main concerns. First, the environmental problems identified by the developed countries did not accurately reflect the genuine problems confronting the developing countries. Second, there was concern that the developed countries' preoccupation with pollution control would have negative implications for trade.[3] Third, there was apprehension that this focus on environmental issues might affect aid and technical assistance.[4]

With regard to the first concern, the general consensus was that there was need for broadening the issues. The report noted that as far as the developing countries were concerned, there were two main types of environmental problems, both of which should be given due consideration in developing policy making and planning. The first problem involved difficulties arising out of poverty itself, and the second related to difficulties inherent in development which could be mitigated, or even avoided, by anticipatory measures. With regard to the other fears, the Panel recommended actions to examine and, where necessary, to protect the developing countries' interests.[5] The overall consensus, reflected in the list of recommendations which the Panel prepared, was that there was a need for a fundamental rethinking in development circles, not only of the nature and importance of environmental issues, but of the requisite policies, procedures and institutional mechanisms that could help identify and resolve these issues in the

development process.[6] It was on this basis that the developing countries agreed to participate in the Stockholm Conference.

By far the major contribution of the developing countries' participation in the preparations for the Conference was the expansion of the concept of the environment (beyond mere pollution control) to include sensible resource management in the process of efforts to eradicate poverty.[7] In addition to resolutions to establish appropriate organizational arrangements,[8] the Conference adopted a Declaration of Environmental Principles and Action Plan. The Declaration represents, in effect, the conceptual basis for the Conference while the Action Plan contained 109 proposals for international and national action.[9] With the hindsight of the decade behind us, the Conference can be seen to have helped materially to produce changes in attitude on the part of both industrialized and developing countries. At the end of the "Stockholm Process," both groups of countries appeared to be more ready to see environmental issues as inseparably connected to other aspects of international relations In the case of the developing countries, a shift from an attitude of considerable suspicion to one of active interest was observable.

B. The Post-Stockholm Surge of Activities

In each of the four countries which form the focus of this study, manifestations of concern occurred in the aftermath of the Stockholm Conference. Ghana created an Environmental Protection Council in 1974.[10] Malaysia incorporatd a National Environmental Policy in its Third Development Plan, and set up a Division of Environment as an

arm of the Federal Government in 1975.[11] In 1976, Venezuela established a Ministry of Environment and Renewable Natural Resources and at the same time adopted principles and guidelines for environmental management.[12] In 1977, the Sudan established a National Committee for Environment.[13] Similar actions multiplied in the developing world and environmental institutions mushroomed. By 1981, nine years after the Stockholm Conference, over 115 countries[14] had set up environmental institutions, as compared with about 15 in 1972. In addition, environmental laws were passed or revised.[15] Other, albeit weaker manifestations of policy, or at least governmental intention, took, and continue to take, the form of the celebration of World Environment Day (5th June, each year), tree planting campaigns, etc. In fact, perhaps because of their popular appeal, such campaigns are referred to quite frequently by government officials as evidence of their countries' success in protecting their environment.

Activities at the international level were equally numerous. During the remainder of the 1970's a series of United Nations Conferences examined a number of issues which have major environmental implications. These were the U.N. Conferences on: Population (Bucharest, 1973); Food (Rome, 1974); Human Settlements (Vancouver, 1976); Deserts (Munich, 1977); Water (Argentina, 1977); Science and Technology (Vienna, 1979). In the Action Plan, organizations like FAO, UNESCO, and UNCTAD were specifically requested to play an active part in implementing some of the Conference's objectives. In 1973, FAO, which, prior to Stockholm, already had a considerable record of helping developing countries in such resource management areas as forestry, fisheries, wildlife, soils and water management, decided to broaden its horizon

and to make periodic assessment of the "State of Natural Resources and Environment" (as a complement to its yearly report on the State of Food and Agriculture).[16] In October 1974, UNCTAD in cooperation with UNEP organized a Symposium on Patterns of Resource Use, Environment and Development Strategies in Cocoyoc, Mexico. The Declaration[17] adopted by this Symposium took a further step beyond the Stockholm Declaration by calling for a new new basic needs approach in the development process.[18] The Stockholm Conference was instrumental also in highlighting the pressing problems of human settlements.[19] This eventually led to the U.N. Habitat Conference in Vancouver in 1976.[20] The work of other U.N. organizations, e.g. UNEP's Regional Seas Programme[21] and UNESCO's Man and the Biosphere Programme are as well-documented and visible as are the work of other intergovernmental and some non-governmental organizations, particularly the IUCN.[22] The same is true of the activities of certain development financing and aid institutions.[23]

C. More Recent Activities at the International Level

It seems clear that, despite numerous distractions from environmental concern in recent years (most notably various manifestations of an avowed energy crisis) there has been considerable progress in interest and concern over relationships between threatened environments and development activities, especially in the recent past. In 1980, eight[24] of the multilateral development financing institutions signed a Declaration of Environmental Policies and Procedures Relating to Economic Development. These institutions agreed to pursue new, environment-oriented policies in seven areas,[25] in order to inject more environmental sensitivity

into their lending activities. At about the same time, the International Union for Conservation of Nature and Natural Resources (IUCN) issued the World Conservation Strategy (WCS),[26] an outline of national, regional and international priority actions required to integrate conservation with development planning. This Strategy lays particular stress on the importance of action to promote and support conservation activities at the national level. Shortly thereafter the Brandt Commission published its own report on the global economy.[27] While the Brandt Commission Report focusses primarily on economic matters, it lays considerable stress on the importance of environmental concerns, particularly in the development policies of the poorest countries.[28] Four months later, in July 1980, the U.S. Government Council on Environmental Quality and the Department of State presented the Global 2000 Report[29] to the President. This report projects the impact of population growth on the world's environment and natural resources through to the end of this century. The Global 2000 Report attempts only to define the problem and does not propose solutions.[30]

Almost 10 years after Stockholm, these activities emphasize the legitimacy of the issues discussed at the Conference. At the same time, however, they underline the still preliminary stage of development of many of the concepts as well as the plans for action. Indeed, it does not seem inappropriate to describe the cumulative effect of these activities as a maturing of the "Stockholm Process." Although few of the declarations and proposals have attained the level of specificity necessary to put them into action immediately, they do represent a major improvement on the rather nebulous and broadly philosophical nature of the Stockholm deliberations. For example, the dictates of

the WCS are so general as to require modifications at the national level for practical implementation. However, the declarations and proposals can be used as building blocks with which individual governments can continue to construct their environmental management policies and programs.

FOCTNOTES - CHAPTER ONE

1. Founex Report: Development and Environment. Report submitted by a panel of experts convened by the Secretary-General of the United Nations Conference on the Human Environment, June 1971. Founex, Switzerland.

2. Maurice F. Strong, who later became the first Executive Director of the United Nations Environment Programme, the new U.N. body that was set up by a resolution of the Conference.

3. The main concern here was that new, stringent environmental standards in the developed countries will have serious repercussions for their foreign trade - e.g. developing country agricultural products may be banned because they do not meet new standards. Some countries even thought that this new preoccupation would herald a new wave of "protectionism." The Founex report recommended that UNCTAD, GATT and FAO should devote attention to studying the impact of these problems and to set international standards. See also Lot, Walter. Environmental Controls in the Federal Republic of Germany and their implications for the Developing Countries. UNCTAD Publication No. UNCTAD/ST/MD/24, United Nations, December 1980.

4. Here, the fear was that concern with environmental issues in the developed countries would either siphon off funds which would otherwise be used for aid programs or that development projects may be held up. Also involved was the question of who would finance the cost of environmental protection measures in development projects. The developing countries argued that more funds should be made available for this purpose - the principle of additionality. For a good analysis see

Macleod, Scott. Financing Environmental Measures in the Developing Countries: the Principle of Additionality. IUCN Environmental Policy and Law Paper No. 6, Morges, Switzerland, 1974.

5. See also Principle 12 of the Declaration and Recommendation Nos. 103b, 108 and 109 of the Action Plan.

6. This view was endorsed by Robert McNamara, the President of the World Bank, in his address to the Conference.

7. Some countries even went as far as equating poverty with pollution. There is little doubt that the shift in attitude among the major development institutions to embrace the basic needs approach had its origins in this argument. See Pearson, Charles and Pryor, Anthony. Environment North and South: An Economic Interpretation. John Wiley and Sons Inc., 1978, Chapter 4.

8. To establish what has now become the main organs of UNEP - The Governing Council for Environmental Protection, the Secretariat, the Fund and the Environment Coordinating Board.

9. U.N. Report of the United Nations Conference on the Human Environment. A/CONF. 48/14/Rev. 1/1973.

10. Environmental Protection Council Decree, 1974. National Redemption Council Decree 239 as amended by Environmental Protection (Amendment) Decree. 1976 (SMCD-58).

11. Government of Malaysia. Third Malaysia Plan 1976-1980. Chapter XI, Government Press, Kuala Lumpur, 1976.

Environmental Quality Act, 1974, Act 27.

12. Venezuela. Ley Organica del Ambiente (6-17-1976) and Ley Organica de la Administracion Central (22-12-1976).

13. Sudan. The National Council for Research Act, 1973, 7th June 1973 and its regulations. The National Council for Research prepared the Sudan's report on the State of the Environment for the Stockholm Conference. On 29th December, regulations were passed to set up a National Commission for Man, His Environment and Development. However, the National Committee for Environment became an active body in 1977.

14. See Appendix II. Also Business Publishers Inc. World Environmental Directory, Fourth Edition. Silver Spring, Maryland, 1980. Trzyna, Thaddeus C. and Coan, Eugene V. The Sierra Club's World Directory of Environmental Organizations, Second Edition. Public Affairs Clearinghouse, Claremont, California, 1976.

15. Brazil was one such country. See Strong, Maurice. One Year After Stockholm: An Ecological Approach to Management, Foreign Affairs, Summer, 1973.

16. Report of the Conference of FAO, Seventeenth Session Rome, 10-29 November 1973. C.73/REP. Rome, 1973.

17. The Cocoyoc Declaration, adopted by the participants of the UNEP/UNCTAD Symposium on Patterns of Resource Use. Environment and Development Strategies. Cocoyoc, Mexico, October 8-12, 1974.

18. Tinker, Jon. Cocoyoc Revisited, New Scientist, 28th August 1975.

19. Although India's and Libya's proposal to set up a fund for housing and settlement was not accepted, the Conference agreed to set up a fund to provide technical assistance for housing purposes.

20. Habitat: United Nations Conference on Human Settlements. Vancouver, Canada, 31st May - 11th June 1976.

21. UNEP. Regional Seas Programme Activity Centre. The Siren. UNEP, Geneva. Nos. 1-11.

22. The International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland. The latest noteworthy activity of this organization is its publication in conjunction with the FAO and UNESCO of the World Conservation Strategy. For the work of other organizations see Environment Liaison Centre report on Non-government Organization Activities on Environmental Issues Related to UNEP Programmes, prepared annually by the CLC for UNEP's Governing Council meetings.

23. For example the World Bank, Environment and Development, Washington, D.C., November, 1979; Environmental, Health and Human Ecologic Considerations in Economic Development Projects. World Bank, Washington, D.C., May 1974. Blake, Robert O. et al. Aiding the Environment: A Study of the Environmental Policies, Procedures and Performance of the U.S. Agency for International Development. Natural Resources Defense Council, 1980.

24. The African Development Bank, The Arab Bank for Economic Development in Africa, the Asian Development Bank, The Caribbean Development Bank, The Inter-American Development Bank, The World Bank, The Organization of American States and The United Nations Development Programme. The other two signatories were the EEC and UNEP.

25. Including technical assistance, research leading to improvement on project appraisal and environmental protection measures and training of staff in the environmental dimension of economic development.

26. IUCN World Conservation Strategy. Living Resource Conservation for Sustainable Development, March, 1980.

27. North-South: A Programme for Survival. Report of the Independent Commission on International Development Issues. The MIT Press, Cambridge, Massachusetts, 1980.

28. Ibid, Ch. 4, pp. 79-89. The Poorest Countries.

29. This report is in three volumes. Vol I - Entering the Twenty-first Century; Vol. II - The Technical Report; and Vol. III - Documentation on the Government's Global Sectoral Models: The Government's Global Model.

30. Although a later publication issued by the same inter-agency group prepared a report outlining some policy opinions for the United States in attempting to deal with the the problem areas needing priority attention: Council on Environmental Quality, Department of State, Global Future: Time to Act. Washington, D.C., January 1981.

ADDITIONAL READING

de Araujo Castro, Jouo Agusto. "Environment and Development: The Case of the Less Developed Countries." International Organization 26, No. 2, Spring, 1982, p. 401.

Dworkin, Daniel M., ed. "Environment and Development." Collected Papers, Summary Reports and Recommendations of SCOPE/UNEP Symposium on Environmental Sciences in Developing Countries, Nairobi, February 11-23, 1974. SCOPE Indianapolis, 1974.

Johnson, Brian and Blake, Robert O. "The Environmental and Bilateral Development Aid." The Environmental Policies, Programs and Performance of the Development Assistance Agencies in Canada, the FRG, the Netherlands, Sweden, United Kingdom andthe U.S. IIED, Washington, D.C., 1980.

McLin, Jon. "Stockholm: The Politics of 'Only One Earth'." American University Field Staff Reports. w. curr. series, Vol. VII, No. 4.

Stein Robert C. and Johnson, Brian. "Banking on the Biosphere?" Environmental Procedures and Practices of Nine Multilateral Development Agencies. IIED, 1979, 1970.

Stone, Peter B. "Did We Save the Earth at Stockholm?" The People and Politics in the Conference on the Human Environment." Earth Island, London, 1973.

CHAPTER II

ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT PROBLEMS IN DEVELOPING COUNTRIES

...A brief look at the effect of population upon environmental and natural resource management. Other sectors discussed include: Agriculture; Deforestation; Water; Sanitation and Environmental Health; Fisheries and Wildlife; and Pollution. It is concluded that many of these areas are well researched and the challenge lies in finding solutions to the problems rather than gathering additional information...

The United Nations Conference on Desertification of 1978, estimates that, if present rates of land degradation continue, close to one third of the world's arable land will be destroyed in the next twenty years.[1] In addition, the FAO estimates that by the end of this Century the remaining area of unlogged productive tropical forest will be halved at present rates of clearance.[2] Environmental stresses on this scale have helped to produce recognition that economic stability is inextricably entwined with the integrity of natural resources. And the following factors affecting natural resources require close examination:

A. Population Size, Growth and Distribution

Population size, growth and distribution is a critical force behind much environmental destruction and stress on natural resources. However, the issue is so politically charged that all discussion of it at the Stockholm Conference was shelved.[3] The pressure which present population trends exert on resources and consequently on economic stability arises from a combination of two or more of the following three demographic factors.[4] First is the absolute size of the country's population itself. It should be noted that a number of experts maintain that population size is not necessarily an important contributing factor to problems of the developing

world.[5] They stress instead consumption patterns and life-style of populations - especially those in rich countries, whose resource demand may be 40 - 50 times that in developing countries. However, an examination of a few of the most populous nations provides abundant evidence to refute this assertion.[6] The second major factor is geographical distribution of the population. A prime example is Indonesia, where more than half of the country's 148 million people[7] live in Java, which represents less than 7% of the country's land area.[8] The third factor is the problem of high rates of growth in either overall population size or in particular geographic regions. An example of damage caused by excessive population growth is Kenya, where a 3.9% annual rate of natural increase in population poses an immense challenge to Kenya's government and a now fully acknowledged threat to the country's development targets and its ecological underpinnings.[9] Figure (1) highlights the severity of this challenge.

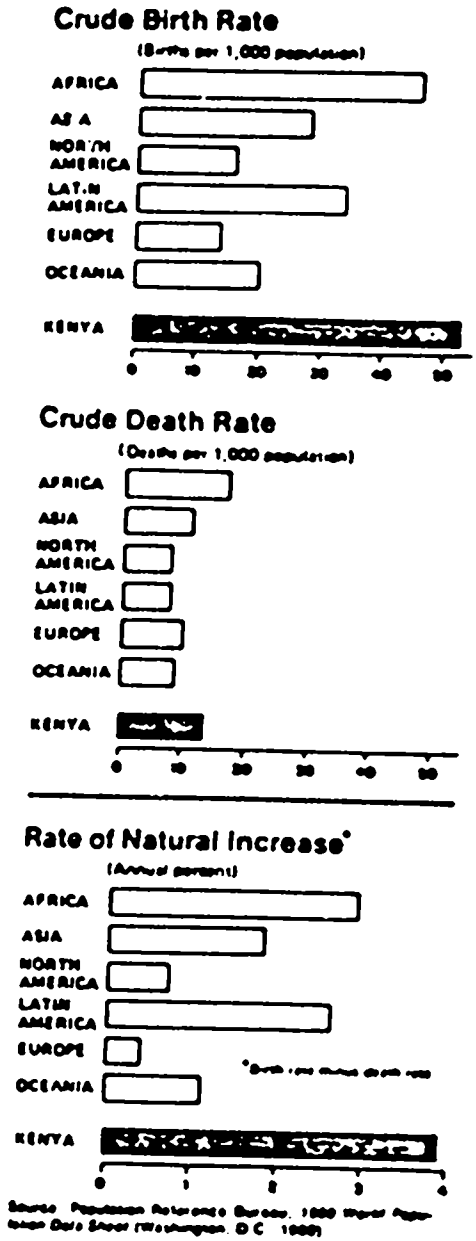
Experts continue to debate the real significance of population pressure. Nevertheless, because of the empirical evidence, most countries have now admitted that population growth is an area which has not only proved amenable to government action (especially where family planning promotion has been combined with efforts at improved maternal and child welfare and nutrition), but in fact that such action is imperative.[10]

B. Agricultural Practices

The population question impacts on every sector of development activity, particularly agriculture and food production.[11] Paradoxically, the ecological instability that poses the greatest threat to world food production and agriculture generally stems from efforts to increase the productive capacity of the land. Such efforts include the mechanization of agricultural processes; overuse, or misuse, of soil, both rain

Figure 1: Kenya's Population Crisis

Where Kenya Stands 1980



Reprinted from: "Kenya's Record Population Growth: A Dilemma of Development". Population Reference Bureau. Vol. 35, No. 3, October, 1980, p. 20, Figure 3.

fed and irrigated; and expansion into marginal lands. All over the developing world both mechanized and traditional farm practices have produced immense ecological damage.

An excellent illustration of the dilemma is to be found in the Sudan. The immense Gezira Scheme (whose cotton and wheat production accounts for nearly 50% of the Sudan's foreign exchange earnings)[12] is showing all the symptoms of excessive use of pesticides and fertilizers. Soil fertility has declined with large concentrations of salts and pesticides accumulating and running off into irrigation canals. One result of this has been a devastation of canal fishing which provided the work force with much of its protein. Moreover, resistant strains of pests are now commonplace. Malaria has returned and schistosomiasis is running as high as 75/80 percent among those working the irrigation canals. As a consequence, output per capita has declined catastrophically despite the annual escalation in pesticides and chemical applications (for example, on much of the Gezira pesticide spraying has increased from three sprayings per growing season in the early 1970's to 12 or more in 1980).[13]

The second major environmental problem associated with agriculture under stress is soil degradation. Soil salinity due to the accumulation of highly soluble salts in the soil,[14] waterlogging resulting mainly from bad irrigation practices, and soil erosion are all important factors contributing to the worldwide loss of arable land. Indeed, recent figures produced by the FAO show that 60% of the soils in the Near East and 51% in India are now at risk.[15]

These problems are exacerbated by the replacement of lost agricultural land of good quality by marginal land. Here the poor quality of the land means that any significant degree of overgrazing and overcultivation - activities that almost inevitably follow when the local people are making desperate efforts to eke out a living - will be rewarded with further loss of land.[16]

The use of marginal land is obviously a critical issue of pressing importance, particularly in arid and semiarid regions.[17] In fact, more than one third of the world's land surface is described as arid or semiarid.[18] It was the alarming rate at which the Sahara Desert was creeping south under stimulus of drought in the mid-1970's that focussed global attention on this insidious problem. In the Sudan, it has been estimated that within the seventeen year period between 1958 and 1975 the desert advanced almost one hundred kilometres. At present the desert is moving south at the rate of five to seven kilometres annually.[19]

Long-term climatic change resulting in periodic droughts is given as a contributing cause,[20] but by far the most damaging impacts are those already referred to.

As with crop protection so with animal husbandry. Advances in agricultural practices which hold so much promise for the developing world can do immense ecological damage in the wrong policy framework. A clear example is the pastoralism practiced in the Sahelian region. Throughout the region, improved veterinary services have resulted in an unprecedented increase in livestock population.[21] Unmet demands for grazing land result in overgrazing, the lowering of water tables, and practices such as burning grasslands in order to improve the quality

of grass for grazing. The net effect is soil instability leading rapidly to infertility and desertification. Overcultivation in marginal areas has a similar effect because, in the dry years following a year of rainfall (a very common phenomenon in arid and semiarid regions), the ploughed soil disintegrates, the fine clays and silt are carried away in dust storms, and the sand moves into dunes.[22] In other parts of North Africa, the Middle East, parts of India and Latin America, similar examples of desertification resulting from various kinds of agriculture/soil-related activities abound.

It has been estimated that over 50 million of the people who live in these semiarid and arid zones[23] depend wholly on agriculture for their livelihood. In the case of the other inhabitants, the outlook is equally bleak, as the rapid loss of agricultural and range land inevitably culminates in declining food production and economic productivity. It is little wonder that the majority of the world's poorest countries are located within these semiarid and arid zones.[24] Indeed, at present rates of deterioration, the prospect for arid countries in what the Brandt Report calls "the poverty belt" has been described as "social suicide."[25]

Yet despite this immensely grim picture, the capacity for alleviating the deteriorating situation is potentially at hand. It was estimated in 1975 that only 43% of the world's potentially arable land was under cultivation[26] (though this figure must now be considerably lower, and indeed in Africa it was estimated in 1975 to be only 22%). Thus given good agricultural practice, the opportunity exists for many countries to extricate themselves from the dim prospects for world food production and to follow more ecologically stable ways of increasing the productivity of arable land.[27]

C. Deforestation

Although most countries acknowledge that proper management of forest resources will ensure their use in perpetuity, improper forestry practices continue.[28] Moreover, the degree of control exercised by governments in forest areas is often minimal. The most serious cause of deforestation today is the compounding effect of land clearing for agriculture (farmlands or grazing land - often for beef ranching for export), wood gathering to provide fuel, and, of less significance, building materials and fodder. The greatest inroads have been made into the humid tropical forests which have been estimated to have already been reduced by more than 40%.[29] Malaysia's rich forest resources are, for example, being logged to provide timber for export[30] and to provide agriculturarl land for the country's land development schemes. Although the Third Malaysia Plan[31] claims that 44% of the country's forests remain untouched and maximum limits have been placed on logging in the country,[32] recent projections by the World Bank suggest that all forest land suitable for agriculture is likely to be converted within three decades.[33] Less conservative estimates predict that the period for total depletion will be before the end of this Century.[34] In most countries, forests are being cleared at a rate that is far faster (three times faster in the case of Nepal) than the rate of reforestation.

The global magnitude of these problems lies in their implications for the maintenance of genetic diversity, the extinction of species and, on a much broader scale, the repercussions which they bear on other resource management problems - soil erosion, siltation, increased flood hazards, and desertification.

D. Water, Sanitation and Environmental Health

In many parts of the developing world, both the continued availability and the quality of water are endangered. The lowering of water tables in parts of the world where groundwater resources play a vital role in the supply of water has been referred to in the preceding discussion on desertification. The combined effects of deforestation and desertification are creating ripe conditions for drought, floods and the siltation of surface water. Although the supply of safe drinking water is given high priority in many developing countries' economies, with consequent heavy capital investments including foreign borrowing, World Bank estimates show that only a small percentage of the population in the developing world had access to safe drinking water in 1975. For the low income countries the figures range from as low as 6% in Ethiopia to 53% in Bangladesh.[35] Of course these figures are based on nationwide surveys and the availability of adequate water is in most cases better in urban than in rural areas as Figure (2) shows.

With regard to water quality, poor sanitation, pesticides poisoning and vector-borne diseases have created a variety of morbid conditions in many developing countries. Sanitation problems are more evident in urban areas, where inadequate sewage disposal systems create grave health risks, than in rural areas.[36] According to Ghana's Environmental Protection Society this causes a major environmental hazard to a majority of the urban population.[37] For example, it has been shown that the provision of adequate sewage facilities in Costa Rica resulted in a sharp drop in the incidence of death from diarrhoea and enteritis.[38]

Figure 2

Access to Community Water Supply and Excreta Disposal Services for Selected Developing Countries, 1975

(% population served)

Selected countries by GNP per capita	Water Supply			Excreta Disposal		
	Urban	Rural	Total	Urban	Rural	Total
Less than $150						
India	80	18	31	87	2	20
Ethiopia	58	1	8	56	8	14
Zaire	38	12	19	65	6	22
$150 to $299						
Pakistan	75	5	25	21	...	6
Tanzania	59	36	38	100	4	10
Indonesia	41	4	11	60	5	15
$300 to $599						
El Salvador	89	28	53	71	17	39
Philippines	82	31	50	76	44	56
Ghana	86	14	35	95	40	56
$600 to $999						
Chile	78	28	70	36	11	32
Turkey	74	64	68	13	5	8
Malaysia	100	6	34	100	43	60
$1,000 to $1,499						
Uruguay	100	87	98	97	17	83
Iraq	100	11	66	75	1	47
Costa Rica	100	56	72	94	93	93

Symbol ... refers to "not available."

Sources: Report by the Director General, WHO Community Water Supply and Wastewater Disposal (Mid-Decade Progress Report), Twenty-sixth General Assembly, World Health Organization, May 1973, derived from Annex 2 and 3, and World Bank Atlas, 1978. Regional Classification from World Economic and Social Indicators, World Bank, 1978.

From: Health : Sector Policy Paper, World Bank, 1980

Some of the vector-borne diseases have been the direct result of big development projects[39] - witness the problems of the Gezira Scheme in the Sudan and the Volta River Development Project in Ghana.[40] Malaria, schistosomiasis (bilharzia), onchocerciasis (river blindness) and trypanosomiasis (sleeping sickness) are endemic in many parts of the developing world. Over 200 million people suffer from schistosomiasis[41] and new malaria cases increased by over 200% in Asia between 1972 and 1976.[42] While most of these diseases are not fatal, they cause, apart from life diminution and suffering, untold economic damage in terms of the manpower potential that is decimated by these debilitating diseases and financial resources (usually hard-earned but scant foreign exchange) which are deployed for disease eradication. This has led some commentators to question the utility of large water development projects and to highlight the need for thorough anticipatory planning including the introduction of more sophisticatd and rigorous environmental cost-benefit analyses into project planning.[43]

Among other types of activities and agents that impair water quality and human health are pesticides; fertilizer runoffs; agro-industrial and industrial wastes and effluents. Pesticides poisoning has been well-documented in many parts of Latin America.[44] Pesticides and fertilizer runoffs are interfering with the health of workers and their families as well as agricultural productivity. In all parts of the developing world, high levels of pesticide residues, particularly DDT, have been recorded in both animals and humans.[45] In Malaysia, water pollution from the rubber and palm oil industries was so acute that more than 40 river basins were unable to sustain aquatic species.[46]

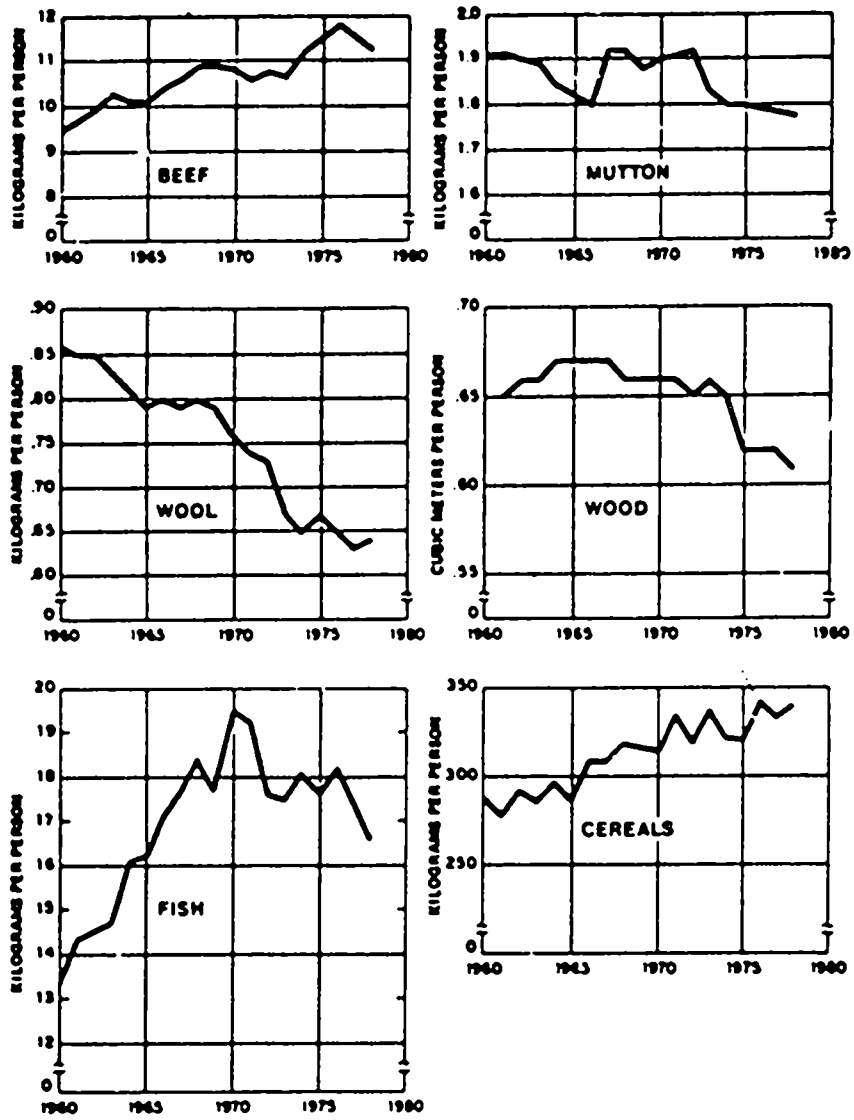
The increasingly clear correlation between the development process and the incidence of certain types of disease poses a challenge to the development community. More financial resources channeled into the health sector must be concentrated upon prevention by improving the planning and design of water supply, sanitation and health care programs. This is a challenge which governments are, at least theoretically, committed to meet by the end of the 1980's, the decade of drinking water and sanitation.[47]

E. Overexploitation of Fisheries and Wildlife Resources

The depletion of riverine fisheries, either by overfishing, dynamiting, the use of poisonous chemicals,[48] or from highly polluted rivers poses equally damaging risks to the maintenance of natural balance and to individual fish populations. The contribution which fish protein makes to the diets of many people in the developing world is very much greater than most people - including development planners - generally imagine. In Ghana, Malaysia and many parts of the Sudan, the principal source of animal protein supply is fish.[49] Marine fisheries are as important, and often as seriously under threat, as fresh water stocks. The sharp drop in global per capita fish production is illustrated in Figure (3). Because of the combined effect of rapid population growth and resource depletion, this effect is more visible in the developing countries than countries where other protein sources are readily available. Although many scientists explain this drop in global fish production on the grounds that the fish catch has reached its maximum sustainable yield,[50] the figures for the developing world have not been adequately

Figure 3:

World Production Per Capita of Some Renewable Resources: 1960 to 1978



Reprinted from: "Resources Environment and Population: The Nature of Future Limits". Population Bulletin Vol 34, No 3. August 1979. p. 14, Figure 2. Population Reference Bureau, Washington, DC.

researched.[51] With the growing adoption of the concept of exclusive economic zones,[52] fishing in an extended area of developing countries' fisheries is bound to increase, especially because of joint venture agreements with more advanced fishing countries like Japan.[53]

All these present and projected activities have serious implications for the assured supply of fish. Hence they accentuate the need for proper management of water and marine ecosystems and perhaps for increased inputs into fisheries management programs such as fish farming.[54]

The depletion of wildlife resources has received considerable attention in the world's press. Even a cursory look at the Convention on the International Trade in Endangered Species would show that a large number of wildlife species are in danger of extinction.[55] In the four study countries undertaken in the course of this project, many wildlife habitants were found to be threatened by, among other reasons, the expansion of urban and agricultural fron- tiers. In the case of Malaysia a major controversy over proposed land development schemes into the Endau-Rompin National Park was eventually defused by a compromise beween the developers and their opponents.[56] In addition, in many parts of West Africa and in Ghana in particular, wild game is an important source of meat, the production of which often offers fewer environmental risks than, say cattle ranching.[57] And, in East African countries there are good illustrations of the revenue- generating potential of wildlife resources. Yet, in spite of the obvious potential of wildlife resources for the development process, excessive and indiscriminate hunting and interference with habitats continue almost unabated. These three important considerations combine to make a strong case for the desirability of sound wildlife management policies and programs.

F. Pollution

As industrialization jostles for position with agriculture in many national economies, its negative side effects have emerged as a reminder that the problems and social costs familiar to the developed countries also can be burdens to be borne by developing countries. The assumption that industrial pollution problems are of marginal significance in developing countries is false. In all four countries studied, serious levels of air, water and marine pollution were found. In Malaysia, pollution from mining effluents, as well as air and noise pollution in urban areas have created dangerous conditions in many parts of the country.[58] Because of the lack of adequate standards or their implementation, air and noise pollution are on the rise, with levels in some developing countries actually being far worse than in many developed areas.[59] The true dimensions of the pollution threat have not been fully understood because these problems are just emerging and their social costs are still largely ignored and indeed uncounted. Although the attitude of some countries may be that such problems are an inevitable consequence of the development process, there is evidence to suggest that in the great majority of cases adequate planning can produce both objectives - environmental protection and economic growth accommodated together.[60]

G. Conclusion

Although choosing to focus here mainly upon population growth, agriculture and forestry, water quality and pollution, it should be clear that only a few of the most serious environmental issues faced in the

Third World have been highlighted. Others, often described mainly in developmental terms, may be equally serious. For example, the problem of human shelter. The countries whose human settlements have the worst environments are generally those with the fastest growing cities and in these the environmental problems described merge with others (such as a shortage of fuel, as firewood becomes scarce). This in turn creates a rural firewood crisis - as cities tend to monetise energy demand - and this increases the strain on forest areas and the threat of soil erosion. Energy problems cannot themselves be separated from the issues described here as a separate environmental problem. Oil prices are inducing countries to plan more major hydro dams - with implications for every part of the environment. However, to dwell on these vast issues at any greater length would focus excessively on environmental issues rather than on what measures are needed to improve national and international management in coping with these inter-connected problems.

Few people today would argue that environmental disequilibrium would not have serious economic implications for developing countries. In certain situations some of these problems even become strategic ones, e.g. the energy problems of landlocked states like Nepal or Malawi. Because environmental degradation is often a slow, physical process which often eludes quantification in economic terms, governments usually focus attention (in terms of programs, resource allocation, etc.) on the ones which assume life threatening proportions, such as famine, drought, floods etc.

Fortunately, the causes of such problems have been well-researched - perhaps even over-researched. This is perhaps a natural reaction in the attempts to find solutions. The challenge now lies in charting courses of action that will bring about solutions. And this challenge is thrown not so much at the scientists and agronomists, etc., who have searched for causes, but at the policy makers who must see the linkages both among these problems and between them and the problems of accelerating economic development.

FOOTNOTES CHAPTER TWO

1. United Nations 1978. U.N. Conference on Desertification: round-up plan of action and resolutions. United Nations, New York, 1978.

2. Lanley, J.P. and Clement, J 1979, Present and Future Forest and Plantation Areas in the Tropics. FO.Misc/79/1 FAO Rome.

3. Nigel Hawkes "Stockholm: Politicking Confusion but Some Opponents Rallied" New Scientist, Vol. 176, 23 June, 1972.

4. Ridker, Ronald G. and Cecekki, Elizabeth W., Resources, Environment and Pollution: The Nature of Future Limits. Population Reference Bureau, Vol. 34, No. 3, August 1979.

5. See generally Erlich, Paul; Erlich, Anne H.; Holdren John P.: Ecoscience: Population Resources and Environment, W.H. Freeman and Company, San Francisco, 1977, Chapter 5.

6. See, for example, World Development Report, 1980. Chs. 4, 8, World Bank, Washington, D.C., August 1980, where many of the most populous developing nations are also in the category of poor developing countries.

7. Population Reference Bureau, 1981. World Population Data Sheet, April 1981.

8. Hull, Terence H.; Hull, Valerie J. and Singarimbun, Masti. Indonesia's Family Planning Story: Success and Challenge. Population Reference Bureau, Vol. 32, No. 6, November 1977.

9. Supra, note 8. Also Mott, Frank L. and Mott, Susan H., "Kenya's Record Population Growth: A Dilemma of Development." Population Reference Bureau, Vol. 35, No. 3, October 1980, p. 38.

10. Brown, Lester "Resource Trends and Population Policy: A Time for Reassessment." Worldwatch Paper No. 29, Washington, D.C., May 1979, pp. 33 et seq.

11. In 1978 agriculture was the leading sector of production in almost all of the low-income countries, accounting for a total of 38% of the total world production in that sector. See World Development Report, 1980, p. 114, Table 3 - Structure of Production.

12. See Bryant, Margi, "The Gezira Scheme: A Lost Cause?" IIED, Earthscan Features, 1980.

13. Pollard, Nigel, "The Gezira Scheme -- A Study in Failure," The Ecologist, No.1, Jan.-Feb., 1981, p. 21.

14. Brown, Lester, "The Worldwide Loss of Crop Land," Worldwatch Paper No. 24, Washington, D.C., 1978.

15. World Environment Report, Vol. 7, No. 16, July 20 1981, p. 3.

16. U.S. Agency for International Development, "Environmental and Natural Resource Management in Developing Countries: A Report to Congress," Vol. 1, pp. 11 et seq. Washington, D.C., February 1979.

17. Ibid, p.9.

18. Kassas, Mohamed, "Arid and Semi-Arid Lands: An Overview," in UNEP Overview on the Priority Subject Area: Land, Water and Desertification, Nairobi, February 1975.

19. Sudan Ministry of Agriculture, Food and Natural Resources; National Council for Research, Sudan's Desert Encroachment Council Rehabilitation Programme (D.E.C.A.R.P.). Prepared in collaboration with UNCP, UNEP (Sudan), FAO, Khartoum, Sudan 1976 P.I.I.

20. Ibid, Chapter 3, p. 35.

21. For example, livestock population in the Sudan currently stands at over 40 m. herd (cattle, sheep goats and camels). Range and Pasture Administration; Ministry of Agriculture, Food and Natural Resources. Range Problems and Activities in the Sudan (unpublished report). Also, Six Year Plan of Economic and Social Development 1977/78 - 1982/83. Ministry of National Planning, Khartoum, April 1977, Vol. 2, p. 24.

22. Supra, note 19.

23. The Sahel, includes Mauritania, Senegal, Mali, Upper Volta, Niger, Chad and the southern fringes of countries like the Sudan, Somalia, etc. See also supra, note 16.

24. Brandt Commission Report, North-South A Program for Survival, Chapter 4, particularly p. 80 et seq., Water and Soil Management.

25. Eckholm, Erik; Brown, Lester, "Spreading Deserts; The Hand of Man," Worldwatch Paper No. 13, Worldwatch Institute, Washington, D.C., August 1977, p. 28.

26. Supra, note 5., Erlich, p. 250. Table 6-3, Washington, D.C., February, 1979.

27. Eckholm, Erik, Losing Ground; Environmental Stress and World Food Prospects, W.W. Norton, New York, 1976, particularly Chapter 1.

28. See generally Persson, Reidar, "World Forest Resources," Royal College of Forestry, Stockholm, 1974; Erlich and Erlich, supra, note 5, Chapters 6 and 11; Eckholm, Ibid, Losing Ground, Chapter 2; Zorbe, J.I., et al., "Forestry Activities and Deforestation Problems in Developing Countries" U.S. Forest Products Laboratories, 1980.

29. Eckholm, Erik, "Planting for the Future: Forestry for Human Needs," Worldwatch Paper No. 26, Worldwatch Institute, Washington, D.C., February 1979, p. 13.

30. In 1980 export earnings from timber was estimated at $2689 m for saw logs and $1293 for sawn timber, see Malaysia Economic Report 1980-81, Ministry of Finance, Malaysia Kuala Lumpur, Oct. 1980.

31. Ministry of Finance, Third Malaysia Plan, 1976-1980, Government Press, Kuala Lumpur, 1976, Chapter XI.

32. Supra, note 30. Only 1/25 of the forest land in the country can be granted by the govenment for timbering each year. Declines in production estimates for 1981 are predicted.

33. UNDP United Nations Task Force on the Human Environment, Asia; Project Findings and Recommendations, U.N. New York, 1978 Annex, 1, p. 39 et seq. Also, Aiken, Robert S. and Moss, Michael R., "Man's Impact on the Nation's Environment in Peninsular Malaysia: Some Problems and Human Consequences" in Environmental Conservation, Vol. 3, No. 4, Winter 1976, pp. 273 et 276.

34. Eckholm, Supra, note 29.

35. Supra, note 7, p. 152, Table 22.

36. Stein, Jane, "Water: Life or Death," 1 D, Washington, D.C., 1977.

37. Ghana Environmental Protection Society. Annual Report 1974-75.

38. World Bank, "Health Sector Policy Paper," IBRD, February 1980, p. 25.

39. Freeman, Peter: "The Environmental Impact of a Large Tropical Reservoir," Smithsonian Institution, Washington, D.C.; Oberg, Letitia, "Some Environmental Issues in Water for Development" in Water Supply Management, Vol. 4, No. 3, 1980, pp. 115-38. Hughes, Charles C. and Hunter, John M., "The Role of Technological Development in Promoting Disease in Africa" in Environmental Issues: Impact and Assessment

of Development. IPEAID, University of North Carolina, Chapel Hill, 1979, Vol. II, pp. 1192; Van der Schalie, Henry, "Aswan Dam Revisited," Environment, Vol. 16, No. 9, 1974.

40. Freeman, Ibid.

41. Supra, note 16, p. 14.

42. Supra, note 36.

43. Supra, note 39 (Freeman); Also, World Bank, "Environmental Health and Human Ecologic Considerations in Economic Development Projects," IBRD 1973.

44. Supra, note 16 p. 105.

45. Ibid.

46. Maheswaran, A.; Abu Bakr Jafaar Singham, Godwin; "Water Quality Management in Malaysia," in The Interdependence of Economic Development and Environmental Quality in Southern Asia: Malaysia as a Case Study, August 4-7, 1980.

47. Launched by the U.N. General Assembly on November 10, 1980. See also Tinker, Jon, "Ten Years for Water," in Development Forum, Vol. VIII, No. 9 November 1980.

48. This is a fairly common practice in Ghana, which in some cass interferes with water supply systems. Interview with Officials of Water Quality Control Unit, the Ghana Water and Sewerage Corporation, Accra, Ghana.

49. Supra, note 16.

50. Supra, note 4 at p. 13.

51. Although FAO work in the fisheries sector has been very extensive. It has impressive statistics on World Fisheries. See FAO "Yearbook of Fisheries Statistics" (annual volumes).

52. A concept introduced by the Third United Nations Conference on the Law of the Sea. For its implications for fisheries see FAO "World Fisheries and the Law of the Sea" Rome, 1979.

53. Ibid.

54. FAO has had the most impressive successes in this field. See also supra, Ehrlich, p. 367.

55. The convention came into effect in 1975. IUCN Bulletin "CITES Comes of Age," IUCN Bulletin January/February, 1980, p. 122.

56. Consumers' Association of Penang (CAP). "The Malaysian Environment in Crisis." Selection from press cuttings. Penang, Malaysia, Sept. 1978.

57. Asibey, Emanuel O. A., "Wildlife as an Economic Resource under West and Central African Situation." Report of Technical Meeting on the Conservation of Biotic Communities in Central and West Africa, Ouagadougou, Upper Volta, 4-10 February, 1980. Also, "Wildlife as a Source of Protein in Africa South of the Sahara," Biological Conservation, Vol. 6, No. 1, January 1974, pp. 32-39.

58. Supra, note 56.

59. Supra, note 16.

60. The World Conservation Strategy, The Brandt Report, etc. are good examples. See Johnson, Brian, "Collision or Concord?" in Development Forum, Vol. VIII, No. 8, October 1980, p. 6.

ADDITIONAL READING

Berg, Alan. "The Nutrition Factor: Its Role in National Development." Brookings Institute, Washington, D.C., 1973.

Brown, Lester; McGrath, Patricia L., and Stokes, Bruce. "Twenty-two Dimensions of the Population Problem." Worldwatch Paper No. 5, ashington, D.C., March 1976.

Brown, Lester. "World Population Trends: Signs of Hope, Signs of Stress." Worldwatch Paper No. 8, Washington, D.C., October 1976.

Farvar, T., Milton, J.P., et al. "The Careless Technology: Ecology and International Development." The Natural History Press, Garden City, New York.

Freeman, Peter. "The Environmental Impact of Rapid Urbanization." Smithsonian Institution, Washington, D.C., 1974.

. "Coastal Zone Pollution by Oil and Other Contaminants." Smithsonian Institution, Washington, D.C., 1974.

Myers, Norman. "The Sinking Ark." Pergamon Press. New York, 1977.

World Environment Report. Vol. 1 - Vol. 7, 1974-1981.

Zorbe, J.I., et al. "Forestry Activities and Deforestation Problems in Developing Countries." U.S. Forest Products Laboratories, 1980.

CHAPTER III

MANAGEMENT POLICIES: PRESENT APPROACHES, DIFFICULTIES AND OBJECTIVES

...A discussion of some approaches to environmental management, followed by an evaluation of the World Conservation Strategy. Problems concerning the definition of environmentally related words and terms are noted. The goal of environmentally integrated development is discussed...

A. Present Approaches

Although some policies originate from constitutional provisions, references to environmental policy in constitutions are often oblique, as in the case of the Sudan's 1973 Constitution,[1] or relate largely to the delineation of authority for control of natural resources, as in the case of Malaysia's 1957 Constitution.[2] The latter is a common practice in many countries which have federal systems of government so it becomes necessary to define management authority between states and the federal government. Very few constitutions make direct reference to environmental control, and in those cases where control is discussed, only limited means are cited. Such reference is either restricted to the natural resource aspects of the environment (as in the case of India - "to protect and improve the environment and safeguard the forests"),[3] or to the health aspects of environment (as in the case of Ghana's 1979 Constitution). Perhaps this lack of explicit constitutional provisions is a consequence of the relatively late arrival of concern with environmental quality *per se* as a matter appropriate for overall national policy making. In fact, in the case of Ghana's 1979 Constitution, the appropriate reference to environment reads like an afterthought.[4]

Do the sources of authority for a policy have much impact on the diligence with which it is implemented? Does an environmental policy which originates from the supreme law of the land - a constitution - have more weight than one which originates from an executive order? If the enforcement record of the two case study countries which have such constitutional provisions is a meaningful indicator, the answer is a definite no. Moreover, the example of Thailand shows that the exclusion of environmental provisions in later promulgations of its constitution had little effect on the intensity of environmental programs.[5] The value of such provisions may lie in one of two reasons - they may be either symbolic, or be the necessary provisions to endow governments with authority in this field.

Symbolic environmental concern embodied in constitutions is clearly not enough. For any such policy to be effective, it requires other levels of specificity: legislation, regulation, formulation of development plans and objectives, or occasional governmental statements on sectoral management objectives. Venezuela's environment policy can be found in a number of legal and institutional measures,[6] and the adoption of the main long-term objective for environmental management by the Ministry of Environment and Renewable Natural Resources (MARNR) - "a type of development designed to meet the basic needs of the present and future populations through the rational use of natural resources."[7] Based on this ultimate goal, MARNR established eight guiding principles for national policy[8]* and formulated six major working areas. These are:

*These include (1) an integrated or comprehensive approach; (2) the need for compatibility in environment and development goals; (3) the need for individual solutions to particular problems; (4) the need for adequate environmental conditions for all men; (5) the need to set up permissible limits of environmental damage; (6) the sustained utilization of natural resources etc. see MARNR "Politica Ambiental-Mission y Creshon," Venezuela 1978.

1) the incorporation of an environmental dimension into the country's development policy
2) environmental planning
3) organization of space
4) environmental education and citizen participation
5) the development of environmental law
6) research

The influence of the Stockholm Conference Action Plan on this environmental manifesto is unmistakable, and this declaration of policy was the most comprehensive and thorough of the four study countries. Malaysia's policy is found in the Third Malaysia Plan (1975-1980) (the Fourth Malaysia Plan is silent on environmental policy) and the Environmental Quality Act, 1975. Ghana's relevant policy is found in the Environmental Protection Council Decree, 1974. The Sudan's policy is in the current Six Year Development Plan -the most direct reference being the "conservation of the country's natural resources"[9] - and in various pieces of legislation, such as the forestry and public health laws.

B. Evaluation of Current Approaches

This brief description illustrates the significant differences in the level of detail with which these policies are endowed. There are only a few developing countries which, like Venezuela, have adopted the comprehensive approach to policy formulation in this field.[10] However, in the majority of cases, the approach is more sectoral than comprehensive[11] and environmental ideas are reflected in sectoral management objectives,

laws, and sometimes the operation of institutions. Even in cases where policies have been formulated recently, there is a variation in focus, depending on the country's needs, priorities or other conditioning factors. The focus of Malaysia's policy, for example, is more on environmental quality and pollution control than on renewable natural resource management - the conditioning factor being the federal governmen.'s lack of constitutional authority to deal with the latter.[12] Where such policies focus on natural resource conservation, it is because natural resource conservation plays a pivotal role in the development process. The Sudan is a good example of this - agricultural development is the fulcrum of the development process in a country that has a large percentage[13] of arid and semiarid land. The need for proper harnessing of these resources not only to prevent rapid loss but also to reclaim some marginal or arid land is easily understood by development planners.

Unfortunately, in the majority of cases, this direct interdependence of environmental and development goals is not so clear. And this lack of clarity has led some countries to declare that environmental management activities should be without prejudice to, or interference with, the overall development process.[14] This caveat reflects a fundamental misconception of the objectives of environmental and natural resources management within the context of development and perhaps in the perceptions of the issues as presented at Stockholm.[15]

C. National Environmental Policies and the World Conservation Strategy

The deficiencies in the policies described above are accentuated when they are compared with the approach to environmental management adopted by the World Conservation Strategy (WCS). The salient feature of the Strategy is its call for a cross-sectoral conservation policy designed to integrate conservation and development.[16] Even though there are fundamental differences in approach, Venezuela's policy comes closest to meeting the ideal of the WCS. Many countries' activities purport to conform with most of the priority national actions set out in the WCS.[17] However, it is also true that many countries are woefully weak in their emphasis on the WCS' first four priorities:

- the adoption of a national or a subnational conservation strategy
- the adoption of anticipatory environmental policies
- a cross-sectoral policy
- the integration of conservation and development

This situation has both led to misconceptions about the role of conservation in the development context and made the WCS a welcome document.[18]

Indeed, the achievement of these four objectives is the ultimate goal of sound environmental and natural resources management. Developing countries and development communities have for a long time been groping for answers to the questions: "How can the development process be pursued on a sustainable basis?"; What are appropriate environmental and natural resources management strategies for developing countries?"; "How can integration be achieved?" It is fair to state that during the entire decade since the Stockholm Conference, attention has focussed on attempting to answer this last question. The World Conservation Strategy is,

to a degree, helpful in this regard. It suggests a framework for a national and subnational conservation strategy. It notes the need for ecosystem evaluation including assessment of environmental effects. And it proposes a procedure for allocating land and water uses appropriate to findings of environmental assessments as well as to the characteristics of various biomes and environmental carrying capacities. The key issues for national policy makers - and these are likely to be extremely contentious at times - can perhaps best be presented under three categories of decision making: decisions as to time frame; as to timetable; and as to resources. The time frame issue raises the question of what weight should be given to long-term as opposed to short-term goals. The timetable indicates the degree of urgency to be given to environmental action, e.g. preventative rather than remedial to the extent that this affects the return on invested capital. Finally, there is the level of resources to be allocated to environmental considerations. Clearly all three issues depend upon the degree to which environmental considerations can be analyzed and economic costs determined as part of the process. This question brings us to the key definitional problems.

D. Definitional Problems

The apparent conflict between environmental and developmental priorities has been a major obstacle to resolving environmental issues in developing countries. Despite the arguments [19] in favour of "environmentally sound development," it is not always easy in practice to decide what this is. Thus, a development scheme which has a river basin development including a hydro dam and irrigation project may be designed and executed in such a way as to minimize direct impacts upon the environment. Such an approach should accord closely with the best planning

and engineering practices.[20] However, it assumes a number of questions to do with siting, alternative choices of technology, integrating patterns of resource use, etc.*

*An actual example here may help to clarify the difference between "good engineering Practice" and environmentally sound development. In a river basin development in Francophone Africa an earth dam flooded a wide shallow valley of 430 sq. km. Engineering studies identified good engineer- ing practice as covering several environmental considerations: seismic effects, public health impacts of the lake water, installation of a 'fish ladder' in the dam to assist an economic fishery, health requirements for downstream irrigation and provision for relocation of the population from the flooded area. A subsequent study (footnote 20), however, demonstrated that an environmentally sound approach would have considered a wider range of issues, e.g. precise siting of the dam to protect an important and touristically as well as scientifically valuable wildlife habitat; possible use of timber and brushwood in the shallow valley before the dam was closed (in the event the great bulk of this valuable wood resource was inundated, but so shallowly that the vegetation is now causing serious eutrophication which is in turn damaging the backup lake's fishery), potential siltation if the forests are cut and soil eroded from the hills of the catchment area (this is already taking place), fuller provision for the relocated population, e.g. training in terraced cultivation so that they can conserve the unfamiliar hill environment to which they have been moved. A higher level of environmental planning would have examined alternative technologies for the production of electricity and irrigation of the flood plain. However, in this case, the opportunity cost of such investigations would have been excessive as the situation of the country in question left little choice; the hydro electric supply from the dam was destined for the capital city to replace expensive imported oil. Nevertheless, a charcoal industry established in the area of the backup lake before the closure of the dam would, it is estimated, have supplied the cooking needs for the entire capital city for an estimated 3-4 years, instead of remaining to pollute the lake and hence preventing navigation, economic fishery or the development of tourism.

The concept of environmentally sound development suffers because the terminology in which it has been discussed is more appropriate to options concerning industrial pollution than to integrated and environmentally sound land use planning. This has led to frequent negative connotations and assumptions of conflict. Hence, writings on environment development relationships are replete with references to "tradeoffs," "polarizing," "competition," "priorities," etc. These adversarial terms are often inappropriate to discussions of natural resource management. During the last three decades, investment in a nation's physical infrastructure, its harbours, roads, airports, dams, etc. often had to be traded off against other potential economic investments or the costs of environmental disruption. However, the economic infrastructure, or development activity based on it, is now being threatened by signs of collapse in the ecological structure on which it, in turn, depends.

Concern with environmental problems will appear less polemical and hortatory (as it often sounds) if an effort is made to make use of language which implies compatibility. Further, such language should describe environmental aspects of the development process not as extraneous, inhibiting factors, but as indispensible elements, with a validity parallel to such vital inputs as finance, manpower, etc.

It is becoming clear, however, that mere linguistic modification is not enough. Further steps must be taken to re-define some of the major terms and expressions which are commonly used. The word 'environment' itself has a multiplicity of meanings ranging from the broadest interpretation that includes all of man's surroundings, including cultural heritage, to the narrowest connotation which is pollution. Even the

word 'pollution' has a broad spectrum of meanings, although more recently there has been a shift away from the rhetorical construction whereby poverty and need become the greatest polluters.[21]

A further definitional problem arises because of difficulties in establishing environmental costs.[22] The failure of many countries to examine environmental cost has been a root cause for their late evolution towards more environmentally sound development strategies, and has made it inherently more difficult for development planners to bridge the gap between environment and development objectives. It seems equally clear that this failure has been due in part at least to difficulties with (inadequacies of) the methodologies available for quantifying environmental impacts in economic terms.[23] The difficulty is acknowledged by both economists and ecologists alike.[24] But difficulty does not imply impossibility, and a few heroic attempts[25] have been made to point ways forward. Among the most note- worthy have been Pearson and Pryor's "Environment North South: An Economic Interpretation." In this text the authors discuss concepts[26] such as environment as a producer and as a consumer good,[27] means of modifying project analysis (mainly cost benefit analysis)[28] and conclude that:

> Development policy that recognizes and accounts for the productive constributions of environmental resources and environmental policy that seeks to maximize the direct and indirect welfare contributions of environmental services, is consistant and mutally supportive. Conversely, the lack of economic development undermines a willingness and ability to undertake environmental preservation, and in some cases makes environmental problems more acute. Also the lack of an environmental policy can frustrate economic development potential. But this conclusion lies in a rarified level of generality. Developing countries are confronted daily with specific development/environment choices for which there are no easy answers.....

> There must be a synthesis between environmental policy and development policy within developing countries. At the most basic level, environmental considerations should enter into project analysis, and special attention should be given to the difficulties of enforcement. Environmental concerns must also enter at all levels of the planning process, especially when strategic development decisions are taken concerning transportation systems, regional development, agriculture and forestry, and patterns of industrialization."[29]

E. The Goal: Environmentally Integrated Development

The goal of the World Conservation Strategy - and indeed most countries accept its precepts - is clear: environmentally sound social and economic development. In approaching this goal, "environment" must be seen as a mutually reinforcing process. If development spreads its benefits to the whole population, and if the growth in wealth and producing capacity that it implies is sustainable in the long-term (a concept which implies a considerable species and hence habitat diversity), then by definition, or by our definition, the human environment will have been adequately protected.

The problem, of course, is how to reach that goal. The solution, as we have stressed, is to integrate the necessary considerations into into development plans. This implies that a local (sub-regional), national, regional or indeed world conservation strategy is, or should be, inseparable from - indeed the same thing as - a sound development strategy.

How can this be brought about? If the objective of development planning and management is integration to the maximum reasonable extent possible of the environmental/natural resource dimension, then it is three dimensional: vertical, horizontal and diagonal. It is vertical within a discipline, or sector, e.g. so that in agricultural projects (e.g. extension training) it is developed alongside the production and

distribution of new seed strains while credit facilities are established for the purchase of the seeds, fertilizer and other inputs. It is horizontal between traditional sectors so that the integration of the agricultural project meshes with public health needs, energy supply, education, housing, transport, etc. It is also diagonal, so that the two axes, vertical and horizontal, produce integration within a region or space whose environment is managed in such a way as to sustain long-term carrying capacity for that development.

Further, integrated development involves a process that takes account of all aspects of society, resources, and environment, and incorporates them into the development process. To this extent at least, the concept is not fundamentally different from that of environmental management. Obviously, the ideal management objective is a development policy that integrates all sectors of government (agriculture, housing, industry, with the appropriate ecological, economic, socio-cultural, institutional and political aspects. It becomes immediately clear that very few countries are able to see these linkages and adopt appropriate policies and programs. Consequently, what is meant by integrated development is the extent to which countries incorporate relevant concerns and conditions (ecological, economic, socio-cultural, etc.) into the development process in order to ensure dynamism in all sectors, while at the same time maintaining enough flexibility to take account of all the constraints described earlier.

That is the goal. But it has to be admitted that in almost every society - both North and South, rich and poor - its achievement remains a long way off. Nevertheless, in addressing themselves to integrated and environmentally sound development, all countries face this longer term objective, and in doing so, discover that they have to deal with the following important management questions:

1) What, and how much, should be done? An appropriate environment component to development policy will only emerge when accurate information on the causes and effects of environmental problems exists.

2) When should significant environmental management be carried out? This question is constantly in the forefront of debate on environment/development issues - the time frame. The appropriate answer will depend on the nature and severity of the problems and the priorities that a country has set for itself. Thus, more may be done for environmental rehabilitation in a sector which is of vital importance to a country's economy, (such as agriculture) than in others.

3) How should it be done? A variety of approaches are likely to present themselves: resource inventories, baseline studies, monitoring systems, standard setting, establishment of a legal and administrative framework, etc. These are all the basic components of the central mechanics of the management system. Nevertheless, modifications will always be necessary in individual cases.

4) Who should do what? This question entails the allocation of responsibility to an appropriate government agency. It may, however, even involve the imposition of an obligation on the private citizen to take some initiative in the actual implementation of programs.

The answers to these questions, if arranged in a systematic way, will lay the foundation for an environmental management system.[30] The approach of the four case study countries to these questions and the lessons learned from studying them are the subjects of the following chapter.

FOOTNOTES - CHAPTER THREE

1. Article 3 of the Constitution vests all natural resources in the state which is ensuring "appropriate exploitation" of such resources. The phrase has not been interpretated by an Sudanese court. Thus inferences as to how the government interprets it can be found in government policies, particularly the current six year development plan. 1978/9 - 1981/82.

2. Constitution of Malaysia, Articles 74, 75 and the Ninth Schedule.

3. Pavez Hassan. "Status of Environmental Protection Legislation in the ESCAP Region." Paper prepared for ESCAP/UNEP Intergovernmental meeting on Environmental Protection Legislation, 4-8 July, 1978, Bangkok, p. 8.

4. Constitution of the Republic of Ghana, 1979, Article 9(2)(e), "Parliament shall enact such laws as will ensure that there are adequate medical and health facilities for all persons and measures to improve the environment."

5. Shane, Jeffrey N. "Environmental Law in the Developing Nations of Southeast Asia," in Developing Economies and the Environment: The Southeast Asian Experience, Colin MacAndrews and Chia Lin Sien, eds. McGraw Hill, 1979, p. 17.

7. Adopted by MARNR after its seminar on "Ambiente et Desarollo" held in September, 1978.

8. See MARNR, "Politica Ambiental-Mission y Gestion, Venezuela 1978.

9. The Democratic Republic of the Sudan. "The Six Year Plan of Economic and Social Development 1977/78 - 1982/83," Vol. 1, Khartoum, April 1977, Ch. III, p. 31.

10. Indonesia is an example. See Government of Indonesia, Minister of State for Supervision of Development and Environment, "Strategy to Prepare a Programme for Environmentally Adapted Development," Jakarta, Indonesia, July 13, 1978; "Indonesia: Improvement of the Environment During National Development" Jakarta, 1980.

11. See generally Johnson, Janice Marie and Johnson, Hope. "Environmental Policies in Developing Countries," Erich Schmidt Verlag, Berlin, 1977.

12. Supra, note 11.

13. Out of the country's total land surface of 250m. hectares, only 80 million can be used for agricultural and livestock production. See Sudan's Desert Encroachment Control and Rehabilitation Programme (D.E.C.A.R.P.), Ministry of Agriculture, Food and Natural Resources, Khartoum, 1976, p. 14.

14. Ghana "Environmental Protection Council Decree" 1974, S. 2(1)(g), "without prejudice to the economic and social advancement of Ghana, to ensure the observance of proper safeguards in the planning and execution of all development projects, including those already in existence, that are likely to interfere with the quality of the environment."

15. Chapter 1 p. 7, et seq.

16. IUCN/UNEP/WWF, "World Conservation Strategy," Item 9, Policy Making and the Integration of Conservation and Development.

17. Ibid, Item 9-14.

18. Allen, Robert. "How to Save the World," The Ecologist. Nos. 6/7, July-September 1980, p. 190.

19. Dworkin, Daniel M., ed. "Environment and Development." Collected Papers, Summary Reports and Recommendations of SCOPE (Scientific Committee on Problems of the Environment)/UNEP Symposium on Environmental Sciences in Developing Countries, Nairobi, 11-23 February, 1974. SCOPE Publication, Indianapolis, 1974; Bassow, Whitman. "The Third World: Changing Attitudes Towards Environmental Protection," In the Annals of the American Academy of Political and Social Science, Vol. 449, July 1979; Mathews, William H. "Moving Beyond the Environmental Rhetoric," Mazingira, Vol. 4, No. 2, 1980, p. 6.

20. Johnson, Brian. "The EDF and the Environment," unpublished IIED paper prepared for the EEC, 1980, pp. 39-44.

21. From a speech of Mrs. Indira Gandhi at the United Nations Conference on the Human Environment, Stockholm 1972. See also, Founex Report quoted in Chapter 1.

22. See, for a helpful step in this direction, Maynard M. Hufschmidt et al. "Benefit-Cost Analysis of Natural Systems and Environmental Quality Aspects of Develoment," East-West Center, Honolulu, Hawaii, October 1981.

23. These difficulties have been recognized by developed countries as well, particularly in the case of conducted cost/benefit analyses of projects, but it is recognized that it should not be an unsurmountable obstacle. See "Royal Commission on Environmental Pollution," First Report H.M.S.O., London 1971.

24. There were many theoretical and empirical studies in the early 1970's, such as: Cooper, C.M., Dasgupta, B., Johnson, Brian, and Singer, H.W. "Economic Evaluation and the Environment." Paper prepared

for UNEP by the Institute of Development Studies and Science Policy Research Unit, University of Sussex, U.K., 1975. Dorfman, R. and Dorfman N.S. eds. "Economics of the Environment: Selected Readings," New York, W.W. Norton, 1972; Herfindahl, Orris C. and Kneese, Allen V. "Economic Theory of Natural Resources," Charles E. Merril Publishing Co. Columbia, Ohio, 1974. In 1972 the U.S. Council on Environmental Quality, EPA and the GPO published a summary of recent studies on the economic impact of pollution control. For an excellent bibliography on the topic, see Barre, Remi. "Environmental Management, Economic Development and Social Welfare: The Economic Basis for Environmental Consideration in Socio-economic Development Policies and Planning" in Environmental Policy, Management and Regulation, IPEAID's Manual for a course on the Environmental Aspects of Industrial Development, University of North Carolina, Chapel Hill, 1979, Vol. III p. 16.

25. Such as Barre, Remi and Culbertson, John M. "Economic Development: An Ecological Approach," Knopf, New York, 1971; Pearson, Charles and Pryor, Anthony. "Environment North and South: An Economic Interpretation," John Wiley & Sons, Inc. 1978.

26. Ibid Pearson & Pryor, Chapter 1.

27. Ibid p. 4.

28. Ibid p. 219.

29. Ibid p. 347.

30. Indeed, they might even resemble most of the priorities for national action in the World Conservation Strategy, supra, note 18.

SECTION TWO - ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT CAPACITY IN DEVELOPING COUNTRIES — LESSONS FROM FOUR CASE STUDIES

...A quick look at the role of institutions for improving environmental and natural resource management capability, a description of the institutional arrangements in the four selected developing countries follows. The countries discussed are: Ghana; Malaysia; the Sudan; and Venezuela. In addition, anticipatory measures for environmental management, including the utilization of Environmental Impact Assessment in these four countries are discussed. Some conclusions stemming from these examinations are drawn....

CHAPTER IV

FRAMEWORKS FOR MANAGEMENT

As already noted, many countries now have either an overall environmental management policy or sectoral policies which reflect varying degrees of environmental consciousness. The political decision which many countries have taken over the last three or four years to incorporate environmental concerns into their economic development poli · has provided a new degree of psychological impetus for these concerns. This chapter will examine the administrative tools through which this impetus may work: the support systems that exist to implement these policies. Focussing mainly upon the experience of the four countries visited in the course of the study: Ghana, Malaysia, Sudan and Venezuela, this chapter will attempt to answer the questions: what role are these institutions supposed to play? (Section I); how are institutional needs currently being met and how have environmental instit itions are ? (Section II); what role do anticipatory management arrangements (including environmental impact statements) have to play in the institutiona. aspects of environmental arrangements?

However, it should be noted that the importance of one or another institutional arrangement for environmental management can be exaggerated. In every case the quality of interdepartmental cooperation; the general concensus as to objectives; political will emanating from leaders, and their capacity to communicate with the mass of their people; these are the real factors that will govern improved performance.

Nevertheless, if that performance is to involve integrated planning of environmental protection with a development goal, then an adequate structure of legislation review and coordinative responsibility is, inevitably, a sine qua non of successful strategy. Without an appropriate administrative framework and budget, the prospects for achieving the environmental goals and integrated development outlined in the preceding chapter are drastically diminished.

A. Role of Institutions for Improving Environmental and Natural Resources Management Capacity

The institutional structure referred to here is intended to encompass most sectors of government administration. But it focusses in particular on agriculture, natural resources, industry and public health. The appropriate role of a functional institutional structure is the provision of adequate, sector-specific institutional support (with an appropriate mechanism for cross-sectoral coordination) in order to perform a range of different functions. These functions range from policy formulation to education and training.

Prior to the Stockholm Conference, many countries had a number of institutions with functions relating to one aspect or the other of environmental control within the various sectors. Both the FAO and WHO had been providing assistance (and continue to do so) to countries through their ministries, departments or agencies for forestry, wildlife and fisheries management, soil and water conservation, and public health and sanitation.[1] FAO in particular, has conducted valuable research on the institutional requirements in resource management in various regions.[2] As indicated in Chapter One, partly in response to the Stockholm Declaration (which called on governments to entrust appropriate national institutions with the task of "Planning, managing or controlling the environmental resources of states with a view to enhancing environmental quality,"[3] and partly because of a clearly felt need for a governmental focal point for environmental matters -- countries started setting up new environmental institutions.

Perceptions about the role of these new institutions differed. Some countries (a small minority) believed that such institutions should perform both advisory and executive functions with regard to <u>all</u> environmental matters -- a sort of core structure, radiating out to all other government institutions. Other countries believed that the new institution should merely perform pollution control functions, either on an advisory basis or on an executive and enforcement basis. This latter alternative was possible in situations where there was no likelihood of the new institution's usurpation of an existing agency's power. Other countries, perhaps concerned that reorganization might be drastic, unnecessary or too costly, opted

for the maintenance of the institutional status quo, giving the newly defined environmental responsibilities to existing institutions.

In each of these situations, the foremost consideration was the creation or reorganization of an institution which would perform the function of overall coordination of environmental activities. The existence of such an institution is vital to rational management. Although the institution's primary functions would be national policy making, coordination, and perhaps some capacity for review,[4] it should also have regulatory functions to endow it with authority and scope for action.

Almost all aspects of government operations have an environmental dimension. The central question is: how big should such an institution be? Can a country afford an institutional superstructure to take care of these issues, or are there other viable alternatives assuming a sufficient degree of political will. A very small institution can make a substantial contribution towards integrated environmental management, if it is properly placed, has the appropriate mandate, and a strong and imaginative leadership with access to the top political authorities. However, given the pragmatism forced upon any new institution dealing with traditional ministries and other power centers in any country's governmental structure,[5] built-in bureaucratic tensions are bound to emerge, especially where financial, technical and manpower resources are scarce. Hence, the most important prerequisites for effective operation seem to be the mandate, the organizational structure and the level of professional competence with which the institution is endowed.

Where an institution's success has been marginal, or where it has failed, one can usually pinpoint the absence of one or more of these elements. Conversely, where an institution is expected to play an active executive role, revisions in the allocations of responsibilities in overall national policy, with a concomitant budgetary allocation, must be made. The case of the new position of Venezuela's Ministry of Environment and Renewable Natural Resources vis-a-vis the nation's Sixth National Plan 1981-1985 is a good example.[6] The plan assigned the Ministry a primary role in the development program and a budget of $500M for 1981.

The creation of such an institutional focal point does not obviate the need for other forms of coordinating mechanisms. Ad hoc inter-agency or inter-departmental bodies may still have an important contribution to make in many instances. For example, a country's water development projects may be so numerous and fraught with so many environmental, or even managerial problems, that an inter-departmental agency, bringing together various departments from the health, agriculture, industries, public works, housing and other ministries may be needed to formulate appropriate policies.

These, then, are the broad institutional needs for environmental management. A brief description and evaluation of the very different approaches adopted by four countries will follow. These surveys were made on the basis of short field visits by IIED personnel during this study.

B. Institutional Arrangements for Environmental Management (or Environmentally Integrated Development)

1. GHANA - The Advisory Approach to Environmental Integration.

The primary government institution with responsibility for overall environmental control in Ghana is the Environmental Protection Council (EPC). The EPC's permanent staff consists of seven environmental professionals and a small number of clerical and non-professional staff. The following governmental agencies are represented on the Council: the Ministries of Health, Industries, Foreign Affairs, Agriculture, Lands and Works, a representative from the Council for Scientific and Industrial Research, the Ghana Water and Sewerage Corporation, university institutions and the Attorney-General's Office.[7] Created in 1974, the EPC is specifically charged with responsibility to:

"(a) Advise the government generally on all matters pertaining to the environment...
(b) Coordinate the activities of all bodies concerned with environmental matters...
(c) Conduct and promote investigations, studies, surveys etc., including training, which relates to the improvement of Ghana's environment...
(d) Serve as the official body for cooperating with national and international institutions concerned with the environment...
(e) Respond to the government on specific requests of an investigatory nature...
(f) Increase public awareness of environmental concerns through educational programs, etc. ...
(g) Without prejudice to the economic and social advancement of Ghana, ensure the observance of proper safeguards in the planning and execution of development projects, and...
(h) Perform such other functions as the government may assign to the Council."

It should be noted that EPC's mandate is mainly advisory. Only items (c) and (g) could be construed as giving the EPC any review and enforcement powers over the project development process.

When it was seen fit to amend the 1974 Act, two new sections were added to the Parent Decree, giving the officials of the EPC power to request information which the Council reasonably needs to give effect to the Act, and power to enter and inspect any premises for that purpose.[8] Thus, even though the EPC's powers were extended under the amendment, the EPC still lacks proper regulatory and enforcement powers.

In the present organizational set-up, the EPC is placed within the Ministry of Finance and Economic Planning. This location is logical since that Ministry is the central point through which all proposals for development schemes within Ghana must pass. However, with merely advisory powers, the EPC becomes merely another check point, always interested, but more often than not, unaware of what is being proposed. There is no case on record in which the EPC has used the power conferred on it by the 1976 amendment to insist on the provision of information. Hence, the number of projects with potential environmental hazards that have been brought to the EPC's attention by private individuals outnumber those that have been referred to it through governmental channels.[9]

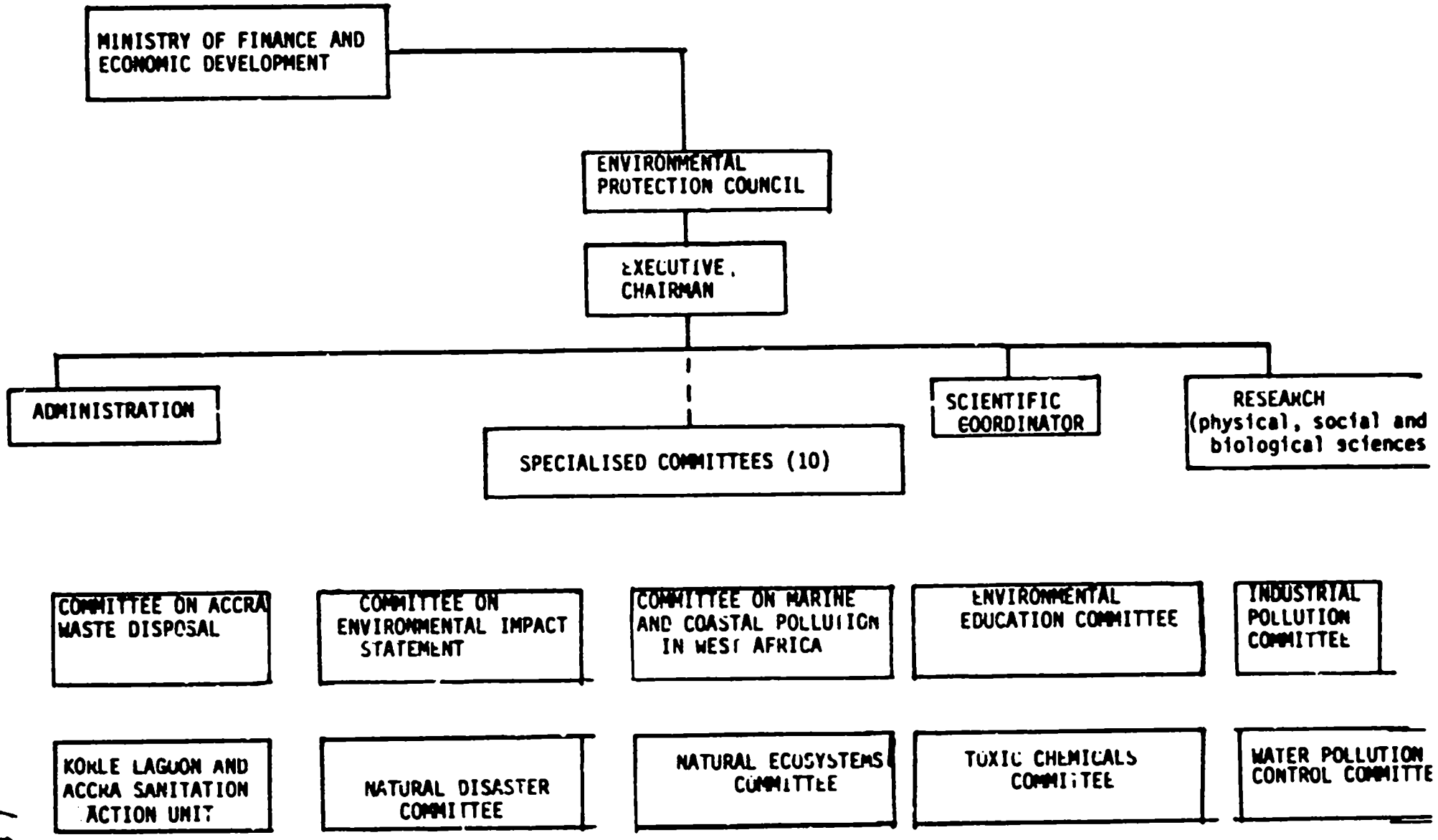
In view of these limitations, the EPC has directed its attention to activities over which it feels it can have more influence, and for this purpose, it has formed the various specialized committees shown in figure 1 to provide guidance.

In addition to these committees, Council members also serve on a variety of committees, such as the Radiation Protection Board of the Ghana Atomic Energy Commission, Pesticide Review Board of

Figure 1

GHANA

ORGANIZATIONAL STRUCTURE OF THE ENVIRONMENTAL PROTECTION COUNCIL



the Ministry of Agriculture, the National Committee for the International Hydrological Programme, and the National Committee for Onchocersiasis. It is through these committees that the Council, especially its full-time staff members, can permeate and thereby exert what influence it can on other government agencies.

The fact that impact has been more pronounced in some areas than others, is reflected in the work of the various committees. In those non-contentious areas where a nation-wide need for environmental control is felt, the EPC has been fairly successful. Water pollution, one of Ghana's major environmental problems,[10] is a good example. Draft legislation has been prepared by the Water Pollution Control Committee. In those cases where the Council's advice is actively sought (e.g. location of a paper mill on the Pra River), or where complaints have been lodged, particularly in areas such as pollution of watercourses, sanitation, etc., the EPC has been quick to respond. Research into refuse disposal in the cities of Ghana is a good example.

In spite of these successes, it is clear that the Council's focus, and the areas where its dynamism have been felt, relate to narrow pollution issues. In fact, the EPC has been so active in, and vocal on this topic that there is a real danger of it overshadowing its other responsibilities.

Admittedly, the Council does not have the facilities - technical, financial and manpower - for monitoring or carrying out an active environmental and natural resource management programme. The resources afforded to the Council are so slender that its capacity

even to communicate with other parts of the government and keep in touch with what is going on is severely limited. However, there are sufficient units within the various Government of Ghana ministries, universities and research institutions which the EPC could mobilize to peform some of its functions. The Council for Scientific and Industrial Research (CSIR) was established in 1968. The following research institutions together form the CSIR: The Animal Research Institute, Building and Road Research Institute, Cocoa Research Institute, Crops Research Institute, Food Research Institute, Institute of Aquatic Biology, Institute of Standards and Industrial Research, Soil Research Institute, the National Atlas Project, the Herbs of Ghana Project, the Water Resources Research Unit and the Industrial Research Institute. These research institutions handle inter alia the research component of environmental concerns. In the performance of a monitoring and active management function the EPC would certainly be acting within its mandate to coordinate government activities. In the important natural resource areas, the EPC is not successful in coordinating the activities of relevant Government of Ghana departments, most prominent of which are the Ministries of Lands and Natural Resources, Health, Agriculture and Works and Housing, and a few agencies such as the Volta River Authority. Each of these has a mandate which extends to an aspect of environmental control. The potential for fragmentation of responsibility, or conversely, duplication of effort is clear.

To illustrate this point, a brief description follows of the environmentally significant work of just two key government agencies and

their relationship with each other and the EPC. Environmental impacts and responsibilities of others are dealt with at length in the specific report on Ghana.

The Volta River Authority

The VRA is the executive agency in charge of the Volta River hydro-electric project, which began in 1961 with the construction of a 500 MW dam at Akosombo. It was originally part of the then Ministry of Natural Resources, Fuel and Power. Upon reorganization in 1981, it was placed under the Office of the President - perhaps an indication of the vital role it plays in Ghana's overall development - and today the VRA manages the power development schemes planned for the whole country including the construction and operation of the power transmission system.

The VRA's responsibilities extend to the provision of facilities for the development of the lake as a source of fish and a route for the transportation of goods, as well as the development of the lakeside area for the health and well-being of inhabitants.[11] Further, the VRA is responsible for executing the provisions of the Mosquito Ordinance in the area around the Dam, for town and country planning and for preventing slums. In addition, the 1961 Act empowers the Minister of Social Welfare to ensure that "no person suffers an undue hardship as a result of the construction of the Dam."[12]

It can be argued that these responsibilities are too extensive (in fact, it is a very good example of "legislating for blue skies"). Nevertheless, even judged by more modest standards, the VRA's performance has been less than satisfactory. The riverine areas and

the dams have been plagued with health problems[13] ever since the reservoirs filled. Some of these health problems increased dramatically during the first two years of the Akosombo dam's existence. Some of the current methods of control, such as use of water-soluble larvicides like ABATE 2000 carry with them other environmental risks as well. Thus, an intensification of aquatic monitoring is required to ensure that there is minimum adverse effect on aquatic life. At present, the CSIR's Institute of Aquatic Biology conducts such monitoring on behalf of the program. Despite these environmental problems, and despite the VRA's being the one government agency which brings about the most far-reaching environmental change in Ghana,[14] the authority is not directly represented on the EPC. Prior to the 1981 restructuring it was represented by its parent ministry. However, it participates in the work of these EPC committees such as the Water Pollution Control Committee which are pertinent to VRA undertakings.

The case of the VRA is a classic example of the relationship between a semi-autonomous, quasi-government institution and other governmental institutions. Generally speaking, such quasi-governmental institutions are powerful and, except in situations where an even more powerful government agency has the mandate (usually of an executive nature), their activities to a large extent go unchecked. In its relations with a purely advisory body like the EPC, the deficiencies in the advisory body become apparent -- the VRA has not been very effective in the environmental management area, and yet the EPC has had little influence over its activities. Admittedly, instances of collaboration between these two bodies can be found,

but generally speaking, the EPC has not had a significant impact on the VRA.

The Health Committee on Water Resources Development

Owing to the large number of water resources development projects being implemented throughout the country, a Health Committee on Water Resources Development[15] was established as an advisory body to the Ministry of Health. The purpose of the Committee is to provide advice and share health-related information among the various agencies engaged in the development of water resources. Represented on the Committee are: (a) the Ministry of Health; (b) the Irrigation Department Authority; (c) the Volta River Authority; (d) the Ministry of Finance and Economic Planning; (e) the Water Resources Research Unit; (f) the Ghana Water and Sewerage Corporation; (g) the Environmental Quality Division of the University of Science and Technology; and (h) the Department of Community Health of the University of Ghana Medical School. The Committee is involved in inventorying known health hazards, monitoring and evaluation of water resources projects, recommending remedial measures, identifying research needs, project identification and encouraging public awareness of problems. Further, the Committee is engaged in preparing guidelines for a legislative instrument requiring all water resources development agencies to obtain a clearance certificate from the Ministry of Health, certifying that all health aspects of future projects had been considered prior to implementation.

The examples of the VRA and the Health Committee illustrate the main characteristic of the institutional framework for environmental management in Ghana -- the fragmentation of responsibility among

the various government departments and corporations as well as the local authorities. Representation on the Health Committee alone illustrates the number of competent agencies in the water resources development field. The situation is the same in many other sectors, even if one focuses attention on only those environment-related institutions in the central administration. This example highlights the magnitude of the task of coordination with which the EPC is charged. Recently, in response to the provisions in the 1979 Constitution,[16] legislation has been passed which will establish lands, fisheries, and forestry commissions.[17] No doubt these commissions will provide the necessary institutional focal points for policy formation and implementation in the natural resource sectors. Nevertheless, these commissions will not obviate the need for an overall national policy and program coordinating unit.

The creation of another advisory body on environmental issues (the Health Committee) in addition to the EPC, increases the need for coordination. But it points also to a serious gap in the EPC's effectiveness. With the exception of coastal zone and marine pollution, all of the natural resource and environmental management problems faced by Ghana have a competent government or quasi-governmental agency, department, or unit with responsibility for policy implementation and programming. The fundamental problem of the EPC, as of most advisory bodies, lies in the level of representation on the Council. In 1974, Ghana believed it needed a purely advisory high level body to meet its environmental management needs. Over the years, the deficiencies of this approach have emerged. First, when faced

with politically powerful quasi-independent bodies, this type of body has very little impact. With regard to all other sectors of government, its lack of executive authority renders it virtually powerless to insist on the implementation of any of its recommendations.

Thus, if one looks only at mandates of the relevant governmental institutions, one could easily gain the impression that Ghana had a sound institutional basis for environmental management with diverse responsibilities for environmental policy and programming and a central advisory and coordinating body. Unhappily this body - the EPC - was handicapped from the start by the mandatory restrictions in its enabling act. As recently as 1979 the Secretary of the Council noted:

> "So far, the functions of the Environmental Protection Council have been largely advisory and catalytic; the Council is not an executing agency with powers of enforcement...we consider that if the nation's environmental protection efforts are to make an effective impact then the Environmental Protection Council should be given the necessary powers to take up cases of environmental infringements and pursue them."[18]

In addition to these constraints, the EPC's limited operating budget, less than 1m cedis (at 1980 official exchange rates, one U.S. dollar equals 2.65 cedis), places a severe restriction on how much it can do. Although the Government of Ghana faces very severe financial problems, the EPC's low operating budget itself indicates the Government's commitment to environmental concerns. It also throws some uncertainty over the future role of the EPC, particularly in light of the present gloomy economic forecast for the country.[19] At the moment, there is no indication that the EPC's mandate, or its position within the GOG administration, will be strengthened

in order for it to be able to provide the overall policy coordination and oversight that is required. Generally speaking, with regard to government budget cuts, it is the advisory bodies (as opposed to the executive ones) whose budgets are most likely to be cut first.

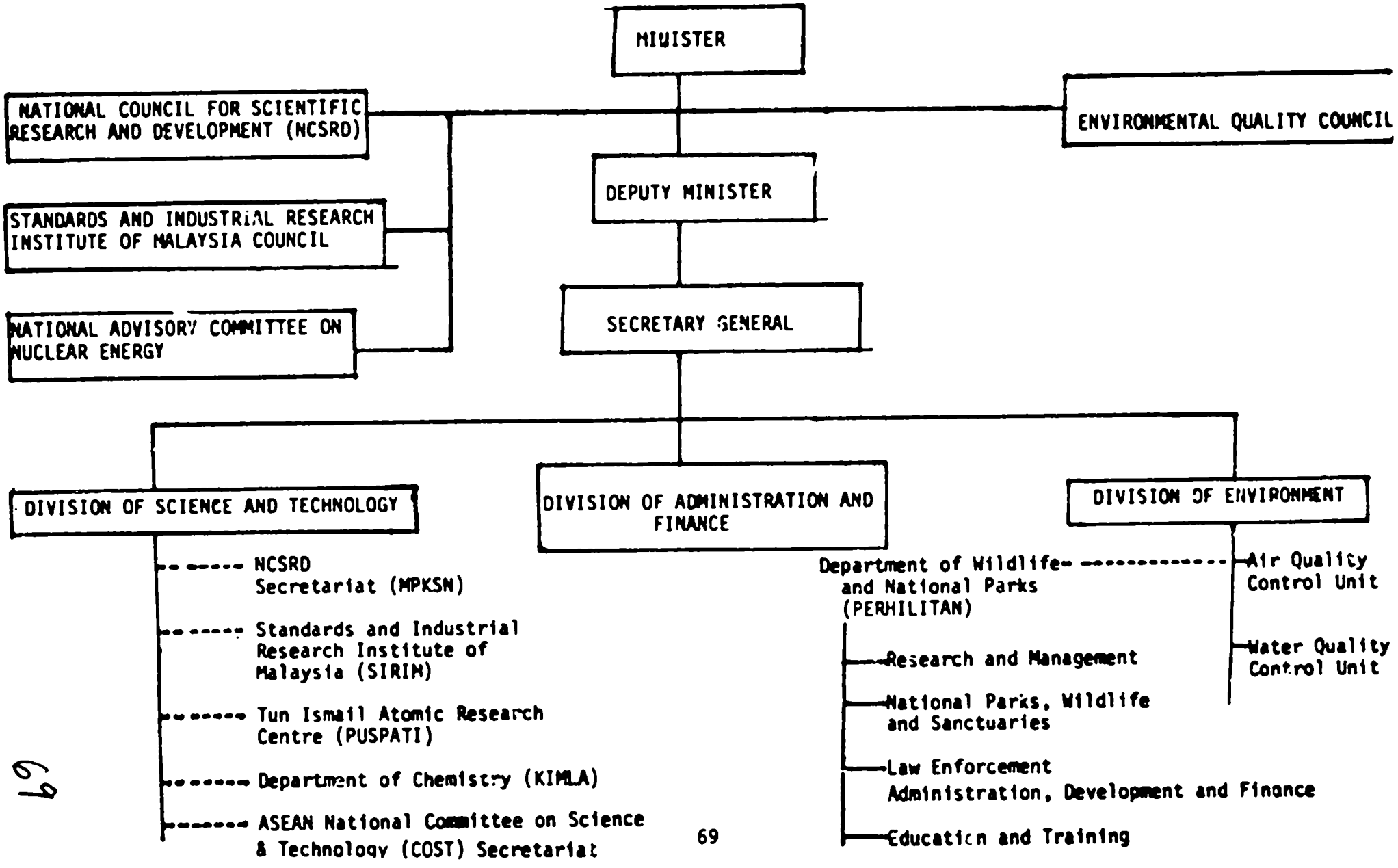
2. MALAYSIA - A Regulatory Environmental Agency in a Federal System of Government

In order to understand the organizational mechanisms for environmental management in Malaysia, a brief description of the constitutional and legal framework for such management is necessary.[20] The 1957 Federal Constitution sets out three types of jurisdiction: federal, state and concurrent. The Federal list includes a wide-ranging group of subjects, from external affairs, industry, public works, scientific and technical research, to education and public health. The Concurrent list applies to those subjects which either the State or Federal governments may regulate, provided that, in the case of conflict, federal law takes precedence. Relevant items in this list include soil conservation, public health, sanitation, disease prevention, national parks and the protection of wildlife, drainage and irrigation and town and country planning. By far the bulk of the country's natural resource management issues, particularly land, agriculture, forestry and water,[21] fall within the legislative and executive authority of the state governments. The mechanism which ensures uniformity or at least harmonization of state laws and programmes on environmental issues is Article 81 of the Federal Constitution. Article 81 provides that the executive authority of the states shall be so exercised as to ensure compliance with Federal

Figure 2

MALAYSIA

ORGANIZATIONAL CHART OF THE MINISTRY OF SCIENCE, TECHNOLOGY AND ENVIRONMENT



law. The federal government is given limited executive powers (the conduct of research, advice and technical assistance to state governments) with regard to state matters (Article 94 of the Constitution). With the exception of professional advice given by the federal government to the Agricultural and Forestry officers of any state, these powers are merely advisory. The overall effect of the system is to create a relatively strong system of state government, especially as far as natural resource management is concerned. As a counterbalance to the states' powers, the federal government is empowered to initiate overall development policy.[22] These constitutional provisions have serious ramifications for federal implementation of overall environmental policy as the following discussion will illustrate.

The Federal Government's Division of Environment (DOE)

The Division is headed by the Director-General of Environmental Quality, a post created under S3 of the Environmental Quality Act of 1974. The Director-General (and consequently (DOE) is given the responsibility of discharging no less than 15 major functions, including the administration of the EQA, the conduct of investigations into the nature and causes of environmental problems, etc. It is important to bear in mind that the DOE was created as an administrative response to a mounting environmental problem -- pollution. The combined effect of this concern and the limitations imposed by the constitutional framework led the designers of the DOE to create a problem-solving institution (as opposed to a policy making and planning institution). Thus, while it may appear that the Director-General has wide-ranging powers, they are restricted to licensing and to monitoring polluting industries.

Because of these limitations, the DOE's two main divisions (air quality and water quality control units with a total staff of 306) strive for optimal use of government agencies. For example, all analyses of samples are done by the Ministry's chemical department, SIRIM (which conducts research on industrial waste treatment technology), PORIM (the Palm Oil Research Institute of Malaysia), and RRIM (the Rubber Research Institute of Malaysia). PORIM and RRIM conduct research on waste treatment technology in the Palm Oil and Rubber Industries, respectively. Some of the marine pollution monitoring duties are shared with the Department of Transportation, which administers the Merchant Shipping Ordinance. The Constitutional limitations on the DOE's powers also account for the following two-pronged strategy which the DOE has adopted to implement the Act.

First, there is the statutory method which is applied to those clear-cut environmental quality matters over which there is little or no debate concerning the federal government's competence. The second strategy entails the issuing of "guidelines" addressed to the state governments, to advise them on methods for dealing with environmental problems associated with development activities in the State List. To date, draft guidelines have been issued to cover the following matters:

1. Siting and zoning of industries -- adopted by the National Land Council.

2. Soil conservation, prevention and control of soil erosion and sedimentation.

3. Solid waste management. These comprehensive guidelines define recommended codes of practice for the disposal of solid wastes on land (selection of disposal sites and land fill development and management), generation, characteristics and handling of solid wastes, and a solid waste and hazardous materials treatment and disposal technology.

4. An environmental impact assessment procedure, guideline and handbook.[23]

Even if all these guidelines become operational immediately, there are reservations about the effectiveness of this modus operandi. In the first place, the DOE is a young agency which as yet has neither the experience, expertise or the constitutional backing similar to that which has enabled the Forestry Department to exercise a comparable degree of influence. Secondly, in spite of the incorporation of environmental policy into the Third Malaysian Plan (TMP), there is little evidence that concepts of environmental management at the state level are sufficiently advanced to assure effective implementation of this non-statutory method of control.

In fact, information on state level environmental activities is scant. The Endau-Rompin controversy is a good illustration of the conflicts that can arise where the federal government sets itself strict environmental policies which the state governments cannot or do not consider necessary to enforce. The federal government had set aside a vast reserve for the protection of wildlife and the creation of a national park. The state government of Penang, claiming that it places human welfare above animal survival, proposed to issue logging licenses for 30,000 acres in the proposed park. This prompted a major campaign to be mounted by NGOs and interested citizens. There were frequent newspaper articles featuring the state

government's stand on the issue. Eventually, it was decided to limit the number to 12,000 acres.

Despite such difficulties, the DOE is satisfied with the initial successes it has had with responses to its guidelines and is impressed by activities which indicate a willingness on behalf of state authorities to cooperate. For example, state level environmental committees are being set up which will provide a focal point for the DOE's six regional officers and, on occasion, state governments have requested the DOE's advice.

The Federal Ministry of Land and Regional Development (FELDA)

FELDA is the federal government agency whose activities have the most far-reaching environmental effect. It was created in 1956 to open up land for development,[24] targeted at between 70-100,000 acres a year under the TMP. FELDA opens up these lands for distribution to settlers who engage in palm oil, rubber, sugar cane or cocoa farming under the guidance of FELDA agricultural officers. Palm oil and rubber account for over 70% of FELDA schemes, and the total number of settler families at the end of 1977 was over 46,000. Output from palm oil and rubber plantations is over 1.5m fresh fruit bunches (ffb) for palm oil and almost 62,000 metric tons for rubber. These figures illustrate the potential for pollution which can, and does, occur.[25]

FELDA's response to the DOE's Palm Oil Regulations which call for the installation of treatment technology to control the quality of palm oil mill effluent (POME) that is discharged, has been to defer the installation of waste treatment plants because of the present unavailability of land. FELDA has allocated all land around the

mills to settlers and consequently cannot install the oxidation ponds which are so important for the POME treatment process.[26] It may be that FELDA finds it cheaper to incur fines under the Palm Oil Regulations than to lay out heavy expenditures to install pollution control equipment. Where fines are paid, the cost is passed on to the settler (there is no local "consumer" to bear the cost because all the palm oil produced is exported at fixed prices).[27]

In fact, the DOE is often frustrated in its attempts to regulate FELDA and, ironically, is faced with a situation where it as a federal regulatory agency, finds it considerably easier to control the private sector than to control another government agency. There are other problems associated with FELDA's method of land clearing -- it rarely heeds technical advice to maintain a vegetation cover along rivers to prevent soil erosion. To conclude, FELDA in its fast growth into a giant land developer has left a trail of environmental problems behind which threaten to undo the gains made by the land development process itself. Its situation is similar to that of the Volta River Authority in Ghana and there are many lessons to be learned from the relationship of such institutions to other governmental institutions.

Forestry Department (Federal Ministry of Primary Industries)

This Department is the federal coordinating agency for forestry practice in Malaysia. All forested areas are subject to the control of state governments.[28] Here the line between the federal government's and the state government's responsibilities is very fuzzy with regard to certain issues and razor sharp in others. To start with all professional foresters employed in state governments are federally recruited, federally trained and report directly to the federal Forestry Department.

Even the non-professional staff (forest rangers, etc.) who are state employees are not eligible for employment in the service unless they have undergone training offered by the federal authorities. The technical superiority of the federal government's experts, and their dominant role in the technical field, might give the erroneous impression of a considerable degree of federal influence over forestry activities. However, while the State Director of Forests (a federal official) gives advice on suitable areas and trees for logging, it is the state governments which have final say in the opening up of areas for felling and the granting of timber licenses etc. Any attempt by the federal authorities to insist on their advice being followed would lead to open confrontation.

Consequently, despite the imperative terms in which the Department's authorities are expressed, there have been many instances of non-compliance, as is evident in the excessive logging and deforestation problems with which the country is faced.[29] Because it takes between 35-70 years for Malaysian hardwoods to regenerate,[30] the challenge facing both the Department and the state governments is formidable. The Department's strategy for tackling some of these problems is embodied in the National Forestry Policy of April 1978, which is designed to provide sufficient incentive for conservation and reforestation measures. With the exception of Johore, all the Peninsular States have adopted this policy. However, Sabah and Sarawak, the two eastern states, have their own policies, which will have to be revised if there is to be uniformity in national forestry practices.

Other Government Departments

A review of the numerous other government departments which have various environmental responsibilities, such as the Department of Mines,[31] the Ministries of Health, etc.[32] is inappropriate here. These organizations are discussed in detail in the Malaysia report. Perhaps the ministry with the most complex task of weaving its way through the maze of constitutionally divided responsibilities is the Ministry of Agriculture. Its responsibilities extend to fisheries, soil conservation, drainage and irrigation etc. Yet marine fisheries is on the Federal list, while riverine fisheries, soil conservation and agriculture are on the State List, and drainage, irrigation and animal husbandry are on the Concurrent list.

The foregoing descriptions of institutions are given to illustrate the multiplicity of government organizations with administrative and sometimes legislative competence over environmental matters. The more detailed discussions on the work of FELDA and others are offered to highlight the problem of competing demands on the country's resources and the pressing need for government agencies, at all levels, to cooperate with each other in environmental policy implementation. The magnitude and complexity of the task of coordination becomes apparent when one realizes that there is another level of administration (state level) which has not been discussed. The constitutional provisions for policy coordination do not seem to be working as well as expected. An example is the National Land Council which was created to formulate a "national policy for the promotion and control of the utilization of land throughout the Federation for mining, agriculture, forestry or for any other purpose, and for

the administration of any laws relating thereto." The last two policies have been issued, but the situation with regard to the mining sector is still in a state of flux. In many cases, the relationship between these institutions and DOE appears to be peripheral at best (as in the case of the Economic Planning Unit and the Implementation and Coordinating Unit of the Prime Minister's Department), or conflicting at worst, as in the case of the Factories and Machinery Department.

The institutional and administrative structure which has evolved over the years to manage Malaysia's environment can be described as a sprawling federal structure with widespread responsibilities and, as will be seen below, a wide-ranging armory of legislation. However, in actual implementation of policies, this machinery barely scrapes the surface of the main issue at hand -- environmental management that takes its rightful place as an integral part of overall national development. A major contributing factor is the bifurcation of responsibility between the federal and state government over vital environmental management issues. Due to constitutional limitations, the federal agency which was established to "promote, encourage, coordinate and carry out planning in environmental management" has been muzzled into a regulatory agency for pollution control only. In this area, the DOE has filled an important gap. But other gaps still exist, the most noteworthy being the need for an efficient central body that provides overall policy guidance and coordination of nationwide environmental management programs in all sectors. Although an Environmental Quality Council has been established, representation of this Council is narrow.[33] None of the

Peninsular States is represented - an indication of the remedial focus (as opposed to planning or preventive) of the federal government's activities. Even with regard to pollution control issues, none of the individual polluting industries - rubber[34] or palm oil[35] is represented on the Council.[36]

3. THE SUDAN - An Existing Ministry Assumes Environmental Responsibilities

The Ministry of Agriculture Food and Natural Resources (MOA)

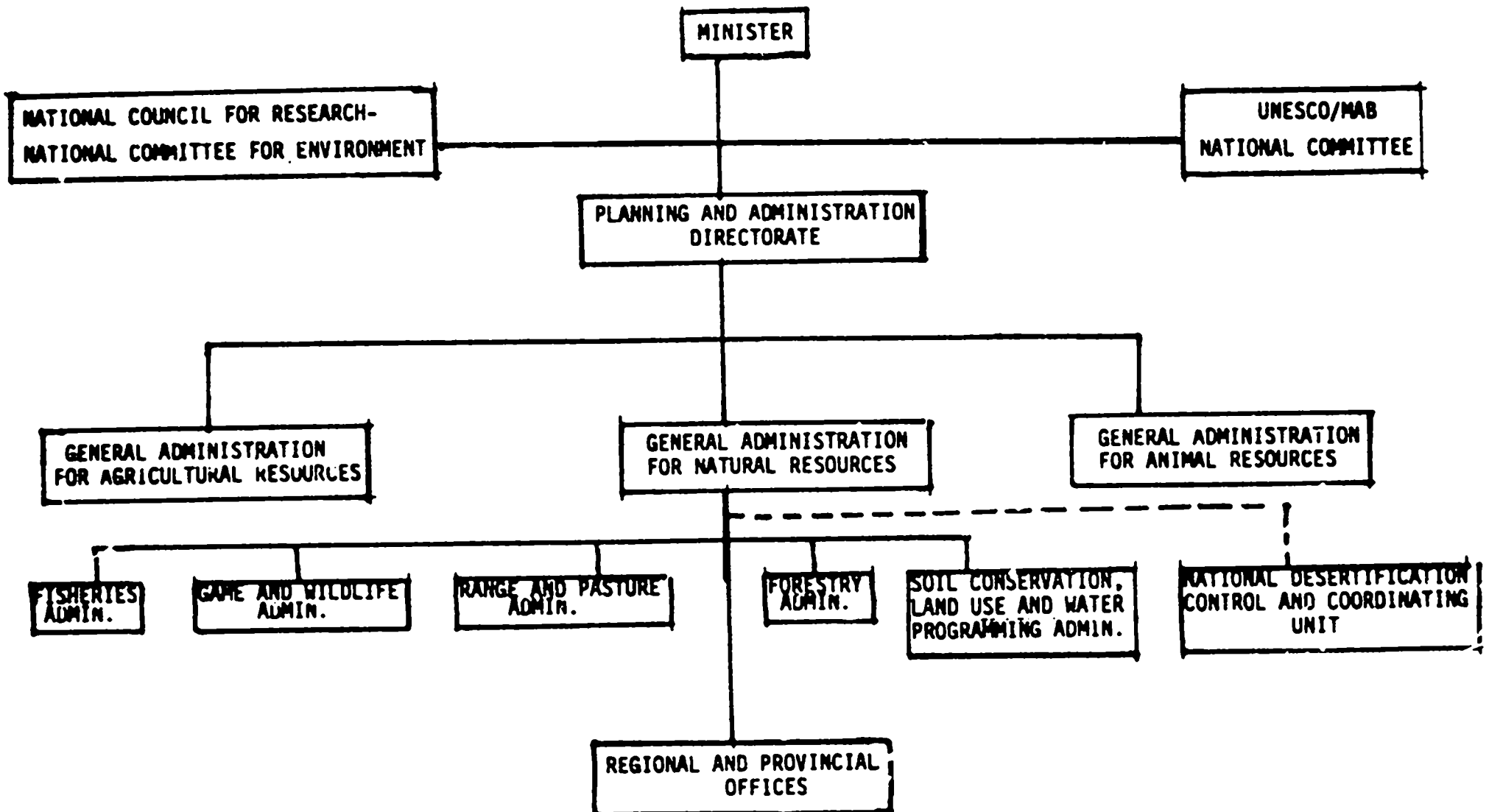
The MOA plays a pivotal role in the implementation of the major provisions of the current Six Year Development Plan (1973-83). The present structural set-up of the Ministry (figure 3) is the result of attempts in the early seventies to consolidate the activities and programmes of agricultural land use, natural resources and environment-related departments within the government administration of the Sudan. It is the embodiment of the most long-lasting coordination attempt so far. The Natural Resources Administration of this Ministry has the task of coordinating all government environment and natural resources-related programmes. This is no mean task, particularly given the size of the country and the added dimension of regional autonomy.

Although the Sudanese State is defined in the 1973 Constitution as a unitary republic, attempts have been made over the last few years to decentralize public administration under the mandate in Article 6 of the Constitution. The process of devolution which commenced in 1971 is designed to give th 18 provinces primary responsibility as well as legislative and executive powers for matters such as education, housing, agriculture and public health. These provinces are later to be reorganized into quasi-autonomous regions like the present southern region.[37]

Figure 3

THE SUDAN

ORGANIZATIONAL CHART OF THE MINISTRY OF AGRICULTURE, FOOD AND NATURAL RESOURCES



The importance of this decentralization policy lies in its impact on the development or management of a region's natural resources and on its environment.[38] In a country as vast as the Sudan, some degree of decentralization is inevitable if government is to function effectively at the local level. However, this raises the important question of whether there are adequate provisions in the necessary policy, or legislation, to safeguard the rational exploitation of resources at the regional level and to ensure that regional environmental management conforms with national standards. These issues are the major concern of many senior government officials and have undergone debate at the highest policy making level.[39] The implication of these problems will emerge from the following description of the work of some of the main departments of the Natural Resources Administration.

By reason of the nature of the service which the Soil Conservation, Land Use and Water Programming Administration attempts to provide, it has an opportunity to collaborate with more government agencies than most. Yet, its work is hampered by the lack of actual collaboration, mainly because of non-coordination of programmes among government departments, uncertainties over the effect of the decentralization policy and the nonexistence of a definitive land use policy. There is no doubt that the most serious natural resource issue in the Sudan is the conflict of land use.[40] One reason for the failure to adopt a land use policy may be the fact that the prerequisite for the formation of such a policy, a national land and water resources survey has not been completed. The size of the country alone makes a survey difficult, and necessitates a major mobilization of human and financial resources. The Administration's strategy

has been to proceed in a piecemeal fashion to conduct regional surveys with foreign financial assistance, rather than to tackle the task in toto.[41]

This problem is not only a major stumbling block to policy formulation and implementation (a Draft Law proposed by the Administration has not received widespread acceptance), but it also has serious repercussions for almost all sections of the Ministry's (as well as other Ministries') work. In the absence of a national policy providing the framework by which local governments are to exercise their powers, the decentralization programme will appear to be doomed to failure even before it comes into effect. The pervasive nature of these problems can be seen in the operations of other sections of the Ministry.

For example, the Range and Pasture Administration's estimates and calculations show that the present livestock population is in excess of the carrying capacity of the total land for grazing.[42] To compound matters even further, the Government of Sudan's policy places high priority on the provision of veterinary services and disease control/prevention.[43] Hence, the livestock population continues to increase without any parallel expansion of rangeland. In addition, the GOS's integrated rural development policies place unprecedented demands on the use of rural areas. These problems are further exacerbated by the fragmentation of authority with regard to another aspect of livestock grazing — the drilling of boreholes The latter is the responsibility of the Rural Water Development Corporation, which is outside the scope, and hence reach, of the Ministry of Agriculture. The Range and Pasture Administration has demonstrated that the drilling of one borehole exposes a 30-40 mile radius of land

around that watering point for livestock grazing. A practice which effectively prevents the drilling of such boreholes at locations of less than that distance apart would reduce overgrazing considerably. The major task now is to convince the local authorities[44] of the soundness of this practice so that they can effect a change in what is usually (because of the central role of livestock in the traditional culture of both the nomads and the semi-nomadic pastoralists of the South) a politically sensitive question in the Sudan.

The Forests Administration faces similar conflict problems. The Administration's call for a harmonious coexistance between agricultural and forestry activities has not been heeded. The horizontal expansion of agriculture, tree felling for fuel[45] and uncontrolled grazing contribution to denudation and adversely affect the natural regenerative capacity of forests. The agriculturalist's apprehensions stem from these basic concerns: tree shelters interfere with irrigation, interfere with plant protection because the trees hamper aerial pesticide spraying, tree shelters take up valuable agricultural land and harbor dangerous pests and insects. In light of these attitudes, the Administration's strategy is to mount an educational drive to impart to inhabitants of forest/agricultural areas the knowledge that the coexistence of agriculture and foresty is scientifically, ecologically and economically viable.

Other Government Agencies

There are a number of other government ministries, agencies and corporations whose activities have a direct bearing on environmental matters. For example, the Ministry of Health is the principal agency

with responsibility for implementing health policy. Under the Six Year Plan, that policy places considerable emphasis on environmental health and requires the allocation of funds for the establishment of environmental health centers at the local level. Malaria and bilharzia control units have been set up within the Social and Rural Health Division of the MOH and elaborate programmes for the eradication of these two common environmental health diseases have been drawn up.[46] These units work closely with the Medical Research Council of the National Council for Research. Both groups are experimenting with a new approach which is designed to encourage more public participation in the improvement of health services. However, most of these agencies play very minor roles with regard to environmental matters. Although the Ministry of Irrigation does not have any discernible focal point for environmental responsibility among its six departments, its programmes have had the greatest impact on water resources management in the Sudan. Housed in the same offices as the Ministry of Irrigation is the Executive organ of the Jongiei Canal Project. This project is a widely-discussed example of the problems but also of the potentials of large-scale integrated planning. Indeed, the project's planners were obliged to modify the scheme's components following public outcry against the potential environmental damage that was threatened by the original alignment of the Canal.

Thus, although the institutional framework is basically extensive in numbers of ministries, divisions and sections with some ill-defined environmental responsibility,* their capacity for integrating environ-

*These are: The Nile Water Department, Dams Department, Irrigation Affairs Department, Projects Department (covering most new development schemes), Hydromechanical Department and the Planning Department.

mental considerations into development schemes is, in practice, extremely limited. The reason for this is mainly lack of coordination both at the policy and decision-making levels within the central and local government administration. These deficiencies are exacerbated by the Ministry of Agriculture's practice of placing the natural resources management aspects of the Ministry's work (as opposed to agricultural services such as crops and fertilizers) very low on the priority funding list. Consequently, resources are often unavailable to implement the management system that is required. With regard to fragmentation of authority, the case of management of dams is a good example. There are three competent Ministries (Irrigation, Agriculture and Industry) and one Public Corporation (The Public Electricity and Water Corporation) involved. The Ministries of Irrigation and Agriculture each have a Nile Water Control Board. With the imminent onset of decentralization, these problems will be accentuated and will call for a strategy to identify and put into effect more innovative and economic uses of existing institutions.

In recognition of these problems a National Committee for Environment was set up as a part of the National Council for Research in 1977. The functions of this Committee are to:

1. Advise the government on methods to be adopted to alleviate the environmental effects of development;

2. Advise the government and policy makers on the country's environmental problems;

3. Cooperate with the Institute of Environmental Studies at the University of Khartoum to provide training programs in the environmental field;

4. Coordinate UNEP's and other international bodies' programs in the Sudan.

The membership of this Committee includes representatives from the Ministries of Health, Agriculture, Industries, Local Government, the Sudan's MAB Committee, the Southern Region's Minister of Agriculture, and interested private NGOs'. In other circumstances, this listing would have provided a sound basis for coordination of most government environmental activities but the Committee's impact has been minimal because representation on the Com- mittee is top heavy and committee meetings are few and far between (twice yearly).

These characteristics would not in themselves necessarily block the Committee's effectiveness as a purely advisory body. However, in the case of the Sudan, the lack of any overall national environmental policy, coupled with the inadequate in-house procedures for coordinating internal programmes, have curtailed the effectiveness not only of the Section of the Ministry of Agriculture with particular environmental responsibilities (Natural Resources Administration), but of the Ministries of Health and Irrigation or other members of the National Committee for the Environment. Consequently, while the problems being faced by the key sections of the Natural Resources Administration point to a need for a clear overall environmental policy (preferably established on a regional basis), the National Committee for the Environment is less than adequate for the task of coordination and leadership in environmental matters which obviously is needed desperately.

4. VENEZUELA - Ministerial Level Management with an Executive Environmental Agency

In contrast to the three other countries examined, Venezuela's 1961 National Constitution designates the state as the main manager for the control and conservation of natural resources, with a caveat that the exploitation of natural resources should enure to the common benefit of the population. None of the twenty-one individual states which form the Federation, nor the municipalities, are given any responsibilities with regard to environmental protection.[47]

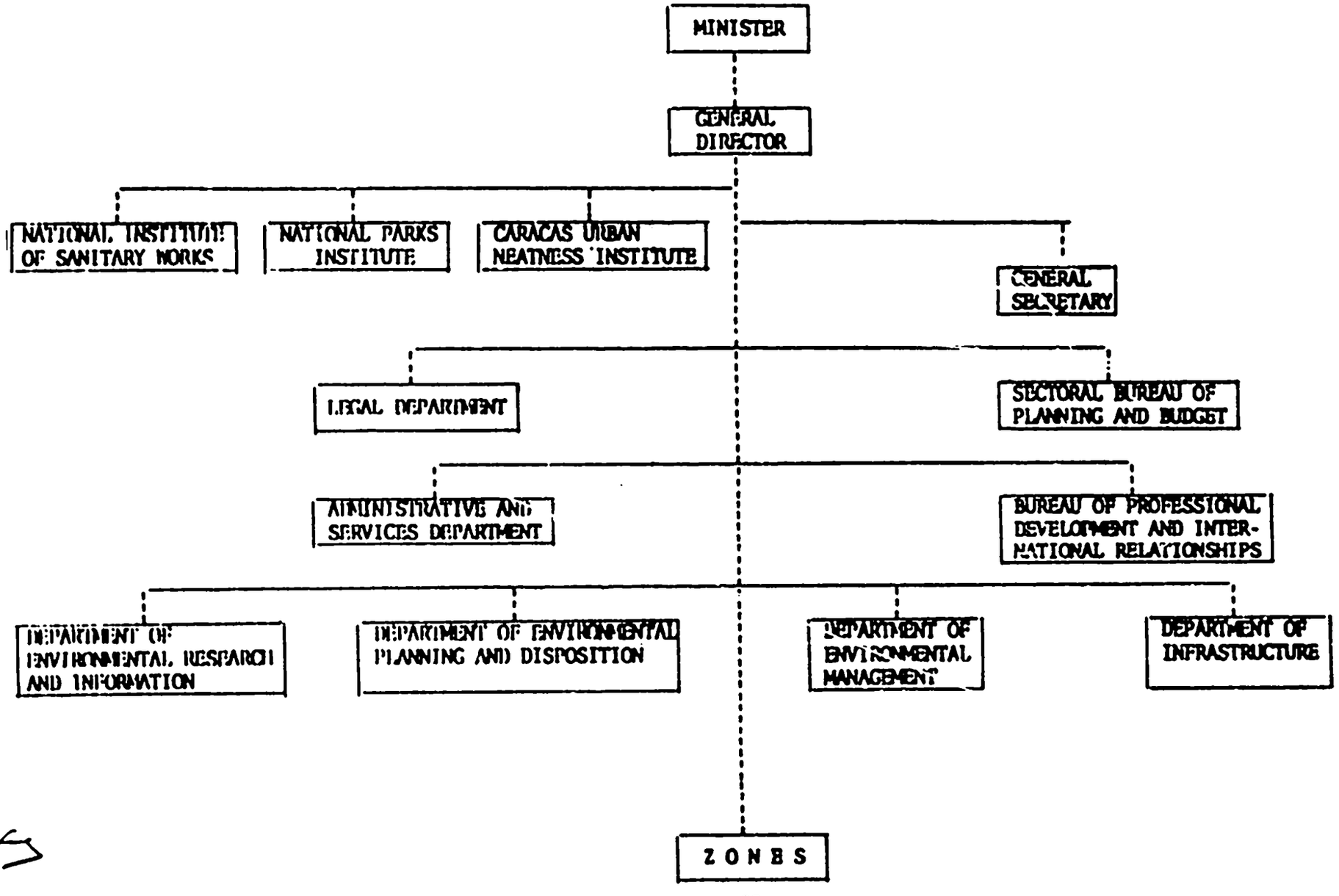
In addition to these constitutional provisions, there are two basic laws which define administrative responsibilities for environmental matters in the country - the Organic Law of the Environment (1976) and the Organic Law of the Central Administration (1977). The latter created the Ministry of Environment and Renewable Natural Resources (MARNR) as the main government agency for "the planning and organization of the conservation, defense and improvement of the environment and renewable natural resources...."[48] It also sets out the respective responsibilities of all other departments within the central administration.

MARNR is a management entity, and it executes work either directly or through the National Institute of Sanitary Work (Instituto Nacional de Obras Sanitarias). In addition to its planning activities, it also has responsibilities for coordinating the activities of government agencies insofar as they relate to environment and renewable natural resources. In order to discharge its extensive mandate, the Ministry has adopted a 5-point strategy which includes environmental planning, environmental education and the development

Figure 4

VENEZUELA

ORGANIZATIONAL CHART OF THE MINISTRY OF ENVIRONMENT AND RENEWABLE NATRUAL RESOURCES



of environmental law.[49] Its total estimated budget for 1981 was $600m.

This functional organization of the Ministry (figure 4) represents an interesting and in some respects an impressive approach to environmental management. Nevertheless, it encounters certain obstacles to effective operation. The main problem is that the structure, as it exists now, does not reflect any distribution of responsibilities over various natural resource issues. The size of the Ministry itself, and the extensive nature of its mandate require a high degree of coordination at all levels of the Ministry's work (and indeed between the Ministry and other government agencies). To provide such coordination, weekly meetings are held between the Minister, the Director-General and the Coordinators of various ongoing programmes. At the interministerial level, two agencies are in charge of such coordination: the Sectoral Cabinet for the Organization of Space (Gabinete Sectorial de Organizacion del Territorio)[50] and the Commission on the Organization of Space.

Another major problem relates to MARNR's overall focus. Little attention is paid to the social aspects of environmental management. Even though problems such as unemployment and urban poverty are studied at MARNR, no proposals for solution or of relative improvement, have yet been developed. Venezuela's national environmental policy is perhaps the most comprehensive of the four study countries. It sets out a very ambitious programme. For example, according to Article 7 of the Organic Law of the Environment, a National Plan of the Environment is to be formulated. This has not yet been done,

although MARNR has prepared a Preliminary Document on what must be included in the final Plan.[51]

Currently, the Preliminary Document seems to have been temporarily shelved. A "Project on Environmental Macro-systems" (Proyecto de Macrosistemas Ambientales) has come into force, to set up new technical bases for the National Plan of the Environment.[52]

According to the professionals in charge of the Project, it is the first one in Latin America to approach the environment in a manner that incorporates all the variables that have a bearing on the environment. The Project attempts to define Environmental Systems consisting of a series of physical-natural and socio-economic sub-systems. Each macro-system will represent "the total configuration of the most relevant interactions within the process of socio-economic-natural functioning."[53] This will show how the effects of some human activities or planning actions are felt, and will provide support for future bases of environmental management.

It is further stated that the methodology adopted "will make it possible to understand the processes of environmental deterioration, of irrational resource exploitation, of inadequate densification, of water pollution, etc., getting to know why the human being, throughout history and at present, uses techniques, social organizations and settlement criteria that are not compatible with an adequate conservation of the environment."[54]

These conceptual and managerial uncertainties, coupled with the number of other governmental agencies with environmental responsibilities whose activities MARNR is required to coordinate, constitute

the perfect example of the complex nature of institutional mechanisms for environmental management. Theoretically, at least, MARNR's coordinating functions should not be problematic. Venezuela's management structure is unique in that there is in existence a law which defines each government institution's responsibility with regard to environmental matters. These provisions are found in Articles 24-37 of the Central Administration Law and relate to the environmental aspects of the duties of the ministries such as Mining and Energy,[55] Agriculture and Cattle Raising[56] as well as the less obvious ones like the Ministry of Defense.[57] Further, a Central Coordination and Planning Office (CORDIPLAN) - Offician Central de Coordination y Planificacion - has been set up to provide guidelines and coordination in regional and urban planning (Article 37). Nevertheless, conflicts abound. MARNR, in its attempts to provide some guidance, or a focal point for all these varied activities, finds itself in a position of conflict. As one official pointed out, a constant problem is "....the excessive zeal of those public agencies which takes MARNR's intervention as interfering in their own activities."[58] On the other side, MARNR is being accused of not having done nearly enough to make an impact on the activities of these agencies.

The dilemma which confronts a major governmental superstructure with such extensive and far-reaching powers in attempting to discharge these functions, places MARNR in an unenviable position. As was pointed out by the former Venezuelan Minister of Environment at the First Venezuelan Congress on Conservation:

"The environment degrading economic interests are the natural obstacles of MARNR. The attitude towards development of many of those contributing to the country's progress makes them underrate collective interests in favor of their own, regarding every norm they must comply with as an obstacle, in their misconception of natural development....

"Another exogenous factor hindering our activities are-(sic) the extreme conservationist interests. These, contradicting the principle of Environment and Development, become aggressively critical when MARNR attempts to reconcile the physical manifestations of economic growth with adequate conditions of environmental conservation."[59]

This latter point - the costs of confrontation and the need for mediating mechanisms - will be discussed in Chapter 7.

C. Anticipatory Measures for Environmental Management Including Impact Assessment

Anticipatory measures are the means by which countries evaluate the potential impact of development programmes or projects on the environment. The important question to consider is the value of assessment procedures in light of the national experience of the four countries whose arrangements for integration of environmental considerations into their development strategies have been discussed above.

During the last ten years, environmental impact analysis has come to mean different things to different people. Types of assessment include technology assessment, risk/benefit assessment and social or economic cost-benefit analysis. The latter is blended increasingly with environmental impact analysis based upon a variety of methodologies for "use allocation" such as "ranking" (which is in itself a formalized method for expressing one's hierarchy of prior-

ities in a project). In fact, the whole subject of anticipatory environmental planning has become a vast field of enquiry with a considerably diversified range of practice.[60]

This diversity of approach suggests a need for flexibility in any external assistance offered to help national impact assessment. The current American procedure for the preparation of an environmental impact assessment is embodied in the new regulations which were issued by the Council on Environmental Quality.[61] The United States adopted the procedures associated with its E.I.S. because the prevailing conditions were and are conducive to its effective implementation.

Whatever the methodology of the chosen procedure, all approaches share one basic component. This can be described in very general terms, as an analysis of data (often from a variety of disciplines) its integration and transformation into policy. The practice with regard to this type of analysis varies. Some countries' evaluation process focuses more on the public health aspects -- the Sudan's for example.[62] Others focus more on environmental quality in general (such as Columbia), or on specific pollutants (such as Pakistan). Yet a few other countries' procedures relate to - or attempt to relate to - total resource management - Venezuela is an example. But, whatever type of assessment a country adopts, integrated data analysis is an essential component. For example, a major hydro-electric project which poses a range of risks from irretrievable loss of unique genetic material to possible seismic hazards requires a risk/benefit analysis. Likewise, cost-benefit analysis is an important step in many types of environmental impact assessment. In this context, however, the traditional cost-benefit analysis (the neo-classical

evaluation of the economic feasibility of a proposed project or programme) requires some modification in order to incorporate information. However, information gaps in many of the developing countries are vast.[63]

To compound the situation, written information, or empirical data, of the type necessary to adapt cost-benefit analysis in the development context is sketchy.[64] In addition, although the multi- and bilateral development assistance institutions have begun to incorporate such analyses into their programmes,[65] detailed information about the state-of-the-art or actual methods used is not readily available. For example, the World Bank's publications[66] on the subject of environment and development do not provide adequate information on the environmental components of their project appraisal process. Another example is the U.S. Agency for International Development's (AID) procedures for evaluating the environmental impact of its foreign assistance programs. In 1977, the Congress gave US AID a mandate to provide assistance for environmental and natural resource management.[67] Further, in 1978, US AID was obligated to consider the environmental effects of its development assistance programmes and was required to identify the major environmental and natural resource problems in developing countries.[68] In response to these mandates, US AID issued environmental guidelines - designed to ensure that environmental factors are integrated into the decision-making process and to assess the environmental impact of the agency's programmes.[69] Further, country and regional environmental and

resource profiles have been commissioned by AID as well as detailed studies such as that on the environmental effects of the proposed developments in the Senegal River basin.[70]

Other examples of the incorporation of environmental and natural resource management evaluation into development agencies' project appraisal are beginning to emerge, although the practice is by no means uniform.[71] For example, the Norwegian Government has instituted a requirement that all development projects of NORAD shall undergo an environmental assessment procedure. Meanwhile a draft Directive of the European Community circulating among its member states, while not specifying overseas official investments, may eventually produce such a requirement.

It is important to remember that the critical prerequisite to effective assessment of development projects is the existence of a national policy that makes such analysis mandatory in specified situations. A discussion of anticipatory planning including environmental impact assessment in the four case study countries follows:

1. Ghana

The Ministry of Industry, Science and Technology (MOI) is the agency with principal responsibility for 'Environmental Impact Statement.' The MOI approves applications for the establishment of industries and determines the allocation of import licenses to the private sector. In fact, the EPC's Committee on Environmental Impact Statement was set up in order to coordinate the MOI's licensing activities and ensure that proper environmental safeguards are incorporated into these activites.

There is no official explanation as to why the expresion 'Environmental Impact Statement' was selected. The most obvious explanation is that the EPC, not having any executive powers, wanted to propose the least disruptive measures for incorporation into the MOI's licensing process. Consequently, the EIS requirement was originally proposed as an amendment to the Manufacturing Industries Act of 1971 (Act 356). That Act provided that licenses should be issued on terms and conditions which take into account certain environmental quality standards. In April 1980, the EPC issued environmental quality criteria concerning water quality. Air and noise standards were to be issued at a later date. The purpose of these standards was to provide for the effective implementation of the EIS proposals as well as the Draft Water Law. As presently proposed, the EIS policy requires the preparation of a separate EIS Law which would require all new project proposals to be preceded by the filing of an acceptable EIS with an interministerial committee on which the EPC will be represented. Such a review is designed to ensure that industrial plants are built and operated in accordance with the environmental quality standards. Membership on this proposed Committee includes the Chief Lands Officer, the Accra City Engineer, and a representative from the Town and Country Planning Department. This membership implies a heavy focus on activities taking place in the capital city only.

The various pieces of legislation in Ghana such as the mining and town and country planning laws charge the relevant institutions with responsibility to ensure that their programmes do not entail

any adverse impacts. Even the VRA, referred to earlier, is a good example. Nevertheless, actual information on the exact methodologies employed in particular instances is unavailable.[72] The EPC reports instances where its advice has been sought with regard to anticipatory environmental assessment; for example, the possible environmental hazards of the manufacture of alumina from local bauxite and the likely effects of the dam on the Volta River at Kpong.[73] With regard to the major activity proposed for the next few years, the construction of a 300 MW dam at Bui, on the Black Volta (scheduled for completion by 1985), an environmental impact study has been prepared by an Australian consulting firm, but there is no indication of the EPC's role in the planning stages of this project.

2. Malaysia

The Third Malaysia Plan establishes Malaysia's policy on environmental impact assessment, with the following caveat "bearing in mind that the adoption of environmental impact assessment will need always to be in balance with development costs." To attain these objectives, an ad hoc inter-agency Panel on EIA[74] was established in March 1977 to advise on methods for the implementation of the EIA proposal. This Panel has adopted the "Guidelines and Procedures for Environmental Impact Assessment" issued by the DOE. This proposal has been presented to the Cabinet and is awaiting approval.

The salient features of the proposal are: the incorporation of the EIA procedure into the prefeasibility and feasibility study phase of project planning in order to avoid delays, the creation of an independent body (a Review Panel)[75] to scrutinize EIA reports and

Approving Committees[76] to approve or reject reports and the establishment of three levels of assessment to ensure that simple straightforward projects are not bogged down by complex EIA procedures.

Generally speaking, specific proposals for projects originate from the states or federal agencies, and are presented to the EPU for screening. The proposed EIA procedure is designed to take place prior to a project proposal being presented to the EPU. However, the interaction between the impact assessment procedure and the rather complex national decision making procedure[77] is unclear. Presumably, the two are supposed to take place simultaneously to avoid wasting time, but even then, it is unclear what impact one procedure has on the other. In the national decision-making process, after the prefeasibility stage, a project proposal goes through a whole series of reviews, which may end up altering the nature and content of the project. If, for example, after the prefeasibility stage and after review by the National Economic Council, a fundamental change (with potential alterations to the environmental consequences) is recommended, it is unclear what mechanism is incorporated into the EIA procedure to take account of such an eventuality.

It is not possible to offer any evaluations of this procedure as no evidence of it having been applied to any development project in Malaysia is avaiable. When compared with the practice and procedure in many developing countries,[78] the procedure appears to be a highly structured and extremely formal process. It remains to be seen how it will be integrated into the national economic development planning process.

However, the lack of a formal EIA process does not mean that no EIA's are conducted. The Drainage and Irrigation Department has constantly performed environmental impact assessments of irrigation projects.[79] And most of the DOE's licensing and permit issuing, particularly with regard to the new industries in the palm oil, rubber and other effluent generating industries will involve an environmental assessment of some kind. Such industries will have to prove that their activities comply with the environmental quality criteria set forth in the 1974 Environmental Quality Act and the regulations made thereunder.[80] However, the problem of getting actual compliance from FELDA at the executive phase has been referred to above.

3. The Sudan

The Sudan has no declared environmental impact assessment. Whatever environmental assessment is done in the Sudan is on an operational basis, the authority for such action being found mainly in either the Public Health or Water Legislation.[81] For example, Article 4(3) of the Nile Pumps Control (General) Regulations 1951, inter alia requires an applicant for a pumping license to satisfy the District Commissioner that ..."(b) there are no objections to the Scheme which make it agriculturally or administratively undesirable....(g) that the Public Health Authority has no objection in principle to the Scheme." These regulations are meant to apply to the major agricultural/irrigation schemes many of which, as is evidenced by the environmental and health problems associated with the Gezira Scheme have adverse impact on the environment and natural resources. If the environmental aspects of the Gezira Scheme which

are covered by these laws are enough evidence by which to judge the adequacy of this environmental assessment procedure, one can say that they have not been very effective. The recent Environmental Health and Public Health laws contain similar provisions for the avoidance of environmental health risks. The Environmental Health Act provides for the creation of an Environmental Health Committee,[82] whose duties involve assisting the Public Health Council in drawing up environmental protection policies. The general characteristic of the Sudan's environmental impact assessment procedure is that it is targeted at the country's major natural resource and development projects (water resources development projects). Little or no information is available on assessment of development projects in other sectors. Even with regard to those sectors which are covered by this policy, there is no information on the appropriate environmental quality criteria. Nebulous phrases like "agricultural desirability" and provisions which require the Public Health Authority's approval "in principle" will not guarantee that certain desirable environmental quality criteria are met. In fact, the experience of the Nile pumps schemes shows that their environmental effects, such as waterlogging and salinity, the numerous environmental health problems, rapid siltation, etc., have not been avoided, nor are they being adequately controlled.

4. Venezuela

Venezuela's approach to environmental assessment is to attempt to institutionalize and conceptualize environmental planning as part of the National Development Planning System. One of MARNR's 15

basic work programmes included in its priorities for action is the formulation of regulations, executive orders and technical norms for the granting of licenses and permits for natural resource exploitation.

Not much accurate information is available on the implementation of this programme. It appears to focus on theoretical issues, which may be necessary in the Venezuelan context because of the numerous jurisdictional conflicts and the different priorities of various arms of government. MARNR has been placed in a position where it will have to exercise review functions over the activities of the majority of public entities and recently, its executive authority has been reinforced in the sixth development plan 1981-1986. The potential for conflict here is nowhere near as sharp as it is with regard to environmental impact assessment, which, because of its usually costly and time consuming nature is often seen by development planners as inimical to rapid economic development. Hence, the need to conceptualize the role of environmental planning in the development process. In this regard, MARNR has adopted a gradualist approach to the implementation of environmental assessment procedures.

General Comments

Perhaps one of the most serious obstacles to the rapid implementation of environmental impact assessment in these countries is the lack of hard data on the carrying and receiving capacities of local natural resources and the environment. Unquestionably, data assessment is one of the most important components of EIA. These problems have an impact on almost all aspects of environmental management, and the real question becomes one of the type of information that

is required. There is a widespread tendency, especially in developing countries, towards fear that data collection requirements prior to decision-making always must be onerous, complex time-consuming and costly. This fear stems from the practice of natural scientists to call for complete data of a high scientific standard. That practice also emphasizes the need for the cooperation of highly qualified people with multidisciplinary backgrounds in the preparation of environmental assessment. Such technical staff should be the best professionals available and adopt a positive approach that will help the others in the team to get projects implemented, not to stop projects. An experienced practical ecologist can often define which are the most critical issues and define what limited data and parameters are essential prior to major decisions of an environmental nature. For some purposes, the vital data (even historical records on rainfall patterns) can usually be extracted within a short period of time. The most important needs are for rapid retrieval of information, and where information is not available, the realization by all concerned that data collection can often be a vital insurance policy that can save as much as the whole capital value of a project.

As noted earlier, development assistance institutions are beginning to adopt their own environmental assessment procedures and standards. The need for clear unequivocal statements of a country's EIA policy becomes very important in the case of multi-donor projects where different EIA requirements may be in force. A good example in point is the case of the Mahaweli Ganga river basin development project in Sri Lanka. No less than seven countries[83] and two U.N.

organizations (UNDP and FAO) are involved in this project. Had AID not examined the overall environmental impact of this programme, it is possible that the four large irrigation areas might have been calculated with different standards.

In concluding this discussion it should be noted that in mid-1981 the Conservation for Development Centre of the International Union for the Conservation of Nature and Natural Resources (IUCN) launched a new Service for the Initiation of Environmental Impact Procedures (SIEP). The Centre's aim is to establish a revolving fund which would finance technical assistance to help the poorer developing countries which have critical shortages of skilled manpower to establish environmental impact assessment processes and to define for which projects they may be appropriate. The assistance under SIEP would be limited to setting up assessments (and procedures) rather than actually carrying them out.

D. Conclusion

In no country can a single government body perform all the functions of environmental management. Four different archetypes of institutional mechanisms for environmental management have been described and their strengths and weaknesses noted. By far the most serious deficiency in all types is the lack of coordination of policies, programmes and activities among the various arms of the government administration. The causes for such lack of coordination vary - some originate because the body with a mandate for such coordination does not have all the power it requires to be able to discharge such functions; some are extraneous and flow from institutional jealousies as well as the tendencies to view such attempts

at coordination as interference.

In this regard, the system adopted by Indonesia may offer a useful paradigm.[84] The relevant environmental management policy is found in the Third Economic Development Plan - Repelita III (1979 -1984),[85] in which the government addresses the country's major environmental problems - pollution and natural resource degradation - and sets out an appropriate policy. The "environmental agency" with responsibility for coordinating the implementation of this policy is the Ministry of State for the Supervision of Development and the Environment, organized in April, 1978. This Ministry was responsible for preparing the national environmental policy. It also coordinates the activities of the 14 principal government ministries and three national organizations with various environmental management responsibilities.[86] In addition, it is in charge of the environmental supervision of development projects. All these functions are performed by a small core staff which includes the minister. This system has a fairly good chance of working because this "primary environmental agency" is independent, has a high level (ministerial) status, which has as its head a prominent, high-ranking official who gives the institution the credibility that is often lacking in many systems. While this example is not proposed as a model, it is an approach which is worth considering because all indications point to the fact that it is a viable approach to the institutional problem in Indonesia.

Finally, as with most decisions regarding environmental management in the development context, many tough policy decisions are required before an appropriate environmental assessment can be adopted by a particular country. Whatever method is adopted, it should set

clearly defined environmental criteria; be an important component of the planning stage of all development projects; be integral to the work of the country's main government institution with environmental responsibility and should designate an authority which is charged with review and monitoring responsibilities that will ensure that the overall environmental standards, criteria and guidelines are met.

FOOTNOTES - CHAPTER FOUR

1. For a description of the environmental aspects of these organizations' activities in the environmental management field, see UNEP "Survey of Activities in the Area: Environment and Development and Environmental Management." Report of the Executive Director, Nairobi, 1978.

2. See generally Cano, J. "A Legal and Institutional Framework for Natural Resources Management," FAO, Rome, 1975. For the forestry sector see: FAO, "Modernization of institutions to promote forestry development," State of Food and Agriculture, FAO, Rome 1979; Adeyoju, S. Kolade. "A Study of Forest Administration Problems in Six Selected African Countries," FAO, Rome, 1976; Piats-Llaurado, Jr., Speidel G. "Comparative Study of Public Forestry Administration of Latin America," FAO, Rome 1975; Velay. "Administrative organisation of forestry in the developing countries," 1970; and Palin, David. "Management of Development Forestry: A Comparative Study of Public Forestry Administration in the Asia-Pacific Region," FAO, Rome, 1980.

3. Declaration of the United Nations Conference on the Human Environment, Principle 17.

4. All of the institutions in the four study countries have one or more of such responsibilities.

5. Mainly because these institutions have final say on budgetary allocations, priorities and consequently responsibility that a particular agency can discharge.

6. See "World Environment Report," February 2, 1981, p. 4.

7. Environmental Protection Council Decree, 1974 (N.R.C.D. 239), S. 3(1).

8. Environmental Protection Council (Amendment) Decree, 1976, (S.M.C.D. 58).

9. Environmental Protection Council, "The Functions and Activities of the Environmental Protection Council (EPC)." 25th May, 1979, at p. 6. Also, various EPC complaints files made available to project staff.

10. University of Arizona Arid Lands Information Center, "Environmental Report on Ghana." University of Arizona, Tucson, 1980; "World Environment Report, "Ghana's Environmental Problems are Basic Ones of Existence," May 24, 1976.

11. Created by the Volta River Development Act, 1961.

12. Ibid S. 29.

13. Onchocerciasis, schistosomiasis, and malaria. Some of these health problems were anticipated during the planning stages of the Volta Dam and proposals on measures to eliminate or minimize these hazards were made in a feasibility report for the project. From the nature of the problems that exist, it does not appear that all the measures outlined in the report were fully carried out. See Derban, L.K.A. "Report on the Public Health Situation in the Area of the Second Volta Dam at Kpong" Accra, Volta River Authority, August 1977 (unpublished).

14. Smithsonian Institution, "Environmental Aspects of a Large Tropical Reservoir: A Case Study of Volta Lake, Ghana" Washington, D.C., Smithsonian Institution Office of International and Environmental Programs, 1974; New Scientist, "Volta Ten Years On," 16 September, 1976. (An analysis of the environmental effect of the Volta River Project); Obeng, Letitia. "Should Dams be Built? The Volta Lake Example," Ambio, Vol. 6, No. 1, 1977, pp. 46-50.

15. The Committee was established in August, 1979. See "Report of the Health Committee on Water Resources Development," "Some Guidelines for Health Effects Assessment" both undated; "Report of Workshop on Mode of Working of the Health Committee on Water Resources Development," 29th August, 1980.

16. Articles 189 and 191 of the 1979 Constitution.

17. The Lands Commission Act, 1980, Act 401, the Fisheries Commission Act, 1980, Act 404, the Forestry Commission Act, 1980.

18. Supra, note 10 at p. 9, "Powers of the EPC."

19. Republic of Ghana, "Budget Proposals for 1980-81."

20. See Hamzah bin Abdul Majid, "Toward Environmental Management: the Malaysian Experience," in Developing Economies and the Environment: the Southeast Asian Experience. Colin MacAndrews and Chia Lin Sien, eds. Singapore, 1979.

21. Although item 6(c) of the State List provides that regulations for water and the control of silt shall be subject to federal law.

22. Article 92 sets out the procedure for promulgating national development plans which may extend to any matter in the State List. An overall national environmental policy was incorporated in the Third Malaysia Plan, 1975-1980.

23. DOE "Pollution Control Legislation and Environmental Guidelines," issued on 19th May, 1980, Kuala Lumpur.

24. See MacAndrews, Colin. "The FELDA Land Schemes in Malaysia" Group Farming in Asia, Singapore University Press, 1979; also Wikkramatileke, R. "Federal Land Development in West Malaysia, 1951-1979," Pacific Viewpoint 13, May 1972; and Syed, Hussain Wafa. "Land Development Strategies in Malaysia - an Empirical Study," Malaysia Centre for Development Studies, occasional paper series, Kuala Lumpur, 1974.

25. For a description of pollution from FELDA's palm oil processing plants, see Ibid MacAndrews.

26. Maheswaran, A. "Problems of water pollution and review of wastewater treatment in Malaysia," paper presented at seminar on wastewater purification by soil, University of Malaysia, Kuala Lumpur, March 1981; Antara Oil Palm Pollution Control Standards Board, "Advances in Palm Oil Effluent Control Technology," paper presented at DOE/IDRC Seminar, November 18, 1980.

27. Ministry of Finance, Economic Report, 1980-1981, National Printing Department, Kuala Lumpur, October 1980 at p. 86 et seq.

28. For a definition of public forestry see Palin, David. "Management of Development Forestry: A Comparative Study on Public Forestry Administration in the Asia-Pacific Region," FAO, Rome, 1980.

29. "Forest Resource Management and its Impacts on Socioeconomic Development Including Environment in Malaysia," paper presented at Miami University Seminar, on the Interdependence of Economic Development and Environmental Quality: Malaysia as a Case Study. August 4-7 1980.

30. Furtado, J. "The Status and Future of the Tropical Moist Forest in Southeast Asia," in MacAndrew and Chia Lin Sien, supra, note 20.

31. For a description of the effects of mining on the environment see Hamzah bin Abdul Majid, supra, note 20 at p. 54.; Sumun, Redzwan, Deputy Chief Inspector of Mines, Mines Department, Malaysia, "The Role and Effects of Mineral Resource Exploitation and Development and the Environment in Malaysia," paper presented at Miami University Seminar, supra, note 29.

32. The mandates of all the government agencies are listed in the 1979 Official Year Book.

33. Mainly from the Secretaries-General of the Ministries of Health, Trade, Labor and Manpower, representatives from the State governments of Sabah and Sarawak and the various manufacturing industries.

34. Supra, note 20, Hamzah bin Abdul Majid at p. 65; John, C.K. "Wastes originating from rubber industry and their disposal," seminar paper presented at Miami University Seminar.

35. Supra, note 20; also Ngan, Ma Ah; Basiron, Yusuf and Mohd Nasr Amiruddin. "The oil palm industry and environmental quality situation," and Maheswaran, A., Abu Bakr Jafaar and Singham, Godwin, "Water Quality Management in Malaysia," both papers presented at Miami University Seminar, Ibid.

36. Although the present representative from the Manufacturing Industries is also head of the Palm Oil Industries Association, it is clear that this representation is only coincidental.

37. The Regional Government Act, 1980, has been passed and the Northern Sudan is now divided into five regions - Northern, Middle, Eastern, Kordofan and Darfur.

38. Alhassan, Mukhtiar. "Decentralisation in the Sudan, Decentralisation, Ecology, Development and Reform," Khartoum, Ministry of Culture and Information, undated.

39. Presidency of the Republic, "Study on Consolidation of Decentralisation," Khartoum, January 1980.

40. See generally, Lebon, J.H.G. "Land Use in The Sudan," Geographical Publication, 1965.

41. FAO "Land and water resources survey in the Jebel Marra area: The Sudan." Report prepared by FAO for the Government of Sudan, acting as executing agency for the UNDP, Rome, 1978. To date, 15% of soils have been surveyed and plans are underway to update the 1958 vegetation map. See also FAO "Strengthening the Soil Survey Administration: The Sudan." Prepared for the Government of the Sudan by FAO acting as executing agency for the UNDP, Rome, 1977.

42. Ministry of Agriculture, Food and Natural Resources -- Range and Pasture Administration. "Ongoing Activities and Projects." Rep on, 1980, "Range Problems and Activities in the Sudan (unpublished).

43. Six Year Plan of Economic and Social Development 1977/78 - 1982/83, Vol. 2, Chapter 24.

44. See generally, ElArifi, Salih Abdalla, "Local Government and Local Participation in Rural Development in the Sudan." Development Studies and Research Centre Monograph Series No. 10, Khartoum, University of Khartoum, 1978.

45. For a discussion of the fuelwood demand and its implications for desertification in the Sudan see Digemes, Turi Hammer. "Fuelwood crisis causing unfortunate land use and other way round," Norsk Geor. Tidsskr., Vol. 33, pp. 23-32, Oslo, 1979.

46. Ministry of Health, Malaria Control Programme, "Malaria Control, 1980-2000," prepared by Dr. Zuheir Ali Nur, Dr. A.M. Harid, Dr. A.A. Mahmoudad, Dr. N. E. Tawil, Khartoum 1980.

47. Lopes Bello, Nelson Aengel, "La participacion de los canseyos Municipales en la ordenacion del Tercitorio," MARNR, Caracas, March, 1978.

48. Ley Organica de la Administracion Central (Ley O.A.C.), Article 36.

49. CORDIPLAN (National Bureau for Coordination and Planning) Politica Ambiental Mission y Gestion," Caracas, 1978.

50. Consisting of the Ministers of Transportation and Communication, Economic Development, Urban Development, Defense, Agriculture and Cattle-Raising (Agricultura y Cria), MARNR and CORDIPLAN.

51. MARNR, "Documento Preliminar para la elaboracion del Plan Nacional de Conservacion, Defense y Meyoramiento del Ambiente," Vol. 1, 1978.

52. This project is implemented by the MARNR with the participation of the Oficina de Ejecucion de Proyectos del Programa de las Naciones Unidas para el Desarrollo (OPE-PNUD), jointly with PNUMA CEPA and UNESCO. Other institutions also participating are the Fundacion Bariloche (Argentina) and OFISEL (Columbia).

53. Gallopin, Gilberto (Fundacion Bariloche), Project Advisor in the methodological aspects for the determination of the Homogeneous Natural Areas, Opinions published in the Journal "Ambiente," IV. 2 Caracas, 1980, p. 17.

54. Rofman, Aleyandro, Economic Adviser to MARNR, in the Journal "Ambiente," Ibid p. 26.

55. Ministry of Energy and Mining. Responsible, along with MARNR, for "preventing environmental pollution derived from energy, mining and hydrocarbons." Article 35.

56. Ministerio de Agricultura y Cria. Responsible for "the encouragement, development, and protection of agriculture, cattle-raising and fishing;" "the planning, central coordination and implementation of the Agrarian Reform;" "the administration and management of vacant land for agricultural uses, according to the land use policy established in the physical-spatial organisation of soils" and for

the conservation and rational use of the land for agricultural purposes," etc. Article 31.

57. Ministry of Defense. Reponsible for: "The maintenance of public security and order, displaying the necessary activities to secure support in the frontier areas and in the control of forests ...hunting and fishing." Article 27.

58. MARNR, "Memoria y Cuenta, 1978," Annual Reports and Accounts, Volume 1 Exposicion General p. 93, Caracas, March, 1979.

59. Speech by Arnoldo Jose Cabaldon, former Minister of the Environment and Renewable Natural Resources, Primer Congreso Venezolano de Conservacion Informe Final. (First Venezuelan Congress on Conservation. Final Report), Caracas, December 13-16, 1978.

60. For a good comparative analysis see Lutz, R.E. "The Laws of Environmental Management: A Comparative Study," 24 American Journal of Comparative Law, 1976, p. 447 and p. 492 et.

61. United States CEQ, "Environmental Quality - 1980. Eleventh Annual Report of the Council on Environmental Quality." Chapter 9, NEPA, and Appendix E - Regulations for Implementing the Provisions of NEPA. Washington, D.C., December, 1980.

62. The Public Health Act 1975, and the Environmental Health Act, 1975.

63. See Hafschmidt op. cit., esp. ch. 3.

64. The literature on CBA in developing country environmental and natural resource management is very limited. See generally Kneese, Alan V. and Bower, Blair T. "Pollution, Prices and Public Policy." The Brookings Institution, Washington, D.C., 1975: UNEP/Office of Industry and Environment, "Industry and Environment Quarterly Newsletter," Paris 1978 -- especially Special Issue No. "Cost benefit

Analysis: a tool for sound environmental management," 1981.

65. For a description of these activities see Stein Robert E. and Johnson, Brian. "Banking on the Biosphere," 1979; and Blake, Robert and Johnson B. "The Environment and Bilateral AID," 1980.

66. World Bank "Environmental Considerations for the Industrial Development Seeker," World Bank, August 1978: "Environment and Development." November 1979.

67. Under the 1977 amendment to the Foreign Assistance Act (S118). See articles etc. quoted in Gaines, Sanford E. "Environmental Effects Abroad of Major Federal Action: An Executive Order Ordains a National Policy," Harvard Environmental Law Review, Vol. 3, 1979, p. 136.

68. 1977 and 1978 additions to the Foreign Assistance Act (S118).

69. For a description of the development of AID's activities in this field, see Blake, Robert O. et al "Aiding the Environment: A Study of the Environmental Policies, Procedures and Performance of the U.S. Agency for International Development." N.R.D.C., February, 1980.

70. Ibid, p. 54 et seq. The environmental study of the Senegal River basin development has been AID's only contribution to that project to date.

71. See Blake and Johnson, supra, note 65.

72. This description of Ghana's policy is based on interviews with officials of the EPC and a review of EPC files on the subject which were made available to project staff. Not much published material is available.

73. Environmental Protection Council, "The functions and activities of the Environmental Protection Council," May 1979 p. 7.

74. The Panel included representatives from the DOE, the Economic Planning Unit, the Integration and Coordinating Unit, Town and Country Planning Department (DID), Fisheries Department, DOA, National Housing Department, Forestry Department, National Parks and Wildlife Department, Geological Survey Universiti Pertanian, University of Malaya, FIDA (Federal Industrial Development Authority) and PETRONAS, the National Petroleum Company.

75. It consists of a chairman appointed by the Ministry of Science, Technology and Environment, specialists in ecology, environmental health cultural and social environment, natural resources management, representatives from the EPU, Ministry of Trade and the public.

76. Either the State Planning and Development Committee, for State projects, or the Estimates SubCommittees of the National Departments, e.g. mines, forests, etc.

77. For a description of this process see UNDP "United Nations Task Force on the Human Environment: Asia Project Findings and Recommendations," UN, New York, 1978, Annex 1, Mission to Malaysia, p. 63.

78. Mayda, Jaro, "Environmental Assessment as an Instrument for the Development and Implementation of Environmental Law." Paper prepared for UNDP's Ad Hoc Meeting of senior government officials expert in environmental law, 28th October - 6th November, 1981.

79. Interview with officials of Drainage and Irrigation Department, Ministry of Agriculture.

80. Particularly the Palm Oil, Raw Natural Rubber and the Sewage and Industrial Effluents Regulations.

81. Supra, note 62. Issued under the Nile Pumps Control Ordinance, 1939.

82. Consisting of a medical specialist in environmental health, a representative of the Ministry of Peoples Local Government, a representative of the Ministry of Industry and a representative of the Office of the Public Prosecutor.

83. Canada, the Netherlands, Japan, Sweden, United Kingdom, United States and West Germany.

84. Minister of State for Supervision of Development and Environment. "Strategy to Prepare a Programme for Environmentally-adapted Development," Jakarta, Indonesia; Goodland, Robert, "Indonesia's Environmental Progress in Economic Development." Paper presented at the Center for South and Southeast Asian Studies, "Ecological Issues in Contemporary Indonesia" July 31-August 3, 1980.

85. Government of Indonesia, "Natural Resources and Environmental Management," (Chapter 6), Repelita III - "The Third Five Year Development Plan," Jakarta, 1978. Minister of State for the Supervision of Development and the Environment, "Improvement of the Environment during National Development," Jakarta, 1980. The Plan came into effect on April 1 1979.

86. Supra, note 84 at p. 5.

ADDITIONAL READING

Alcantara, Pedro. "A Strategy for Environmental Protection in Mozambique," Institute de Investigacao Cientifica de Mozambique, Maputo Mozambique, 1980.

Dee, Norbert et al. "An Environmental Evaluation System for Water Resource Planning," Water Resource Research, Vol. 9, No. 3, 1973.

Ditton, R., and Goodale, J., eds. "Environmental Impact Analysis: Philosophy and Methods." University of Wisconsin Sea Grant Program, Univerity of Wisconsin, Madison, 1973.

Fox, Irving. "Institutions for Water Management in a Changing World." 16 Natural Resources Formulate, 1976, p. 743.

Harris, M. "The Institutional-Legal Face of the Environmental Coin." 54 Nebraska Law Review, 1975, p. 299.

Herox, Walter E. and Imtiazi, Vasif. "Notes on Environmental Management in Pakistan: An Overview and Description of Selected Institutions." The Ford Foundation, Islamabad, Pakistan, May 1977.

Herbert, Paul V. "Guidelines for Incorporating Environmental Parameters into Project Appraisal." IPEAID Vol. 11, Environmental Issues, Impact and Assessment of Development, 1979, pp. 112-212.

Matos, Cruz A. "A Review of the National Environmental Board of Thailand." Office of Technical Cooperation, United Nations, August 1977.

Pearson, Charles and Pryor, Anthony. "Environment North-South -- An Economic Interpretation." John Wiley and Sons, 1978. Chapter 4, "Environment and Development Project Appraisal."

Schramm, Gunter. "Water Management in Developing Countries: Human-Institutional Factors." 16 Natural Resources Journal, 1976, p. 723.

Singh, Gurbachan. "Watershed Management Administrations and How to Create Them." UNASYLVA, 1976, p. 32.

Velay, Louis Henri. "Designing Forest Services to Suit the Country." UNASYLVA, 1975, p. 17.

WHO. "Health Aspects of Environmental Pollution Control: Planning and Implementation of National Programs." WHO Technical Rep. Series No. 554, WHO, Geneva 1974.

CHAPTER V

LEGAL AND REGULATORY ASPECTS OF ENVIRONMENTAL MANAGEMENT

...The role of law is examined. Current approaches concerning the legal aspects of environmental management in the four study countries - Ghana, Malaysia, the Sudan and Venezuela - are explored. Finally, some general conclusions are drawn from these reviews...

A. The Role of Law

Law has always been an important component of natural resource management systems. Long before the recent preoccupation with environment, sectoral laws concerning many aspects of natural resource management, for example forestry,[1] wildlife[2] and water resources[3] were in existence. The Legislative Branch of the United Nations' Food and Agricultural Organization has conducted a pioneering survey of existing legislation in agriculture and natural resources in most of the member countries of FAO. The International Union for the Conservation of Nature and Natural Resources' Environmental Law Center is compiling a complete list of texts on environmental policy and law from various countries. Also, it has initiated a computerized system - the Environmental Law Information System. Both organizations are excellent sources of data on world-wide legislative texts.

Many of the laws in developing countries date back to colonial days. Some were management - as opposed to production - oriented, and incorporated sound principles for species and habitat conservation.[4] More recent legislation generally contains management - or conservation-oriented provisions. For example, the Philippines' Revised Forestry Code[5] states in Section 30 hat there shall be "no expansion or integration

of existing processing plants nor establishment of new processing plants unless environmental considerations are taken into account and adequate raw material supply on a sustained-yield basis is assured."

Many of the existing health codes contain provisions designed to enhance environmental health by encouraging improved sanitation and prevention or control of communicable diseases.[6] Similar environment-conscious provisions are found in industrial legislation (e.g. for the occupational safety of workers). Over the last 10-15 years, many governments in the developing world have passed environmental legislation of general application. These activities illustrate a growing awareness of the importance of law as a necessary component of the environmental management system.

What then is the role of environmental law? Although there is more literature on the conceptual basis for environmental law in developed countries' legal systems than for the developing countries,' many of the functions which laws perform are easily transferable to the developing country situation.[7] The foremost function of law as a management tool is to ensure that actions and activities at all levels of government and in the private sector, conform with environmental quality criteria. They must, therefore, be "management-oriented."

As was seen in the preceding chapter, the institutional framework for environmental management responsibility is a rather complex amalgamation of government bodies. Consequently, legislative policy-making cannot, and should not, be confined to any one agency. There ought to be a complementary (as opposed to competitive) sharing of responsibility in this field.

B. Legal Aspects of Environmental Management - Current Approach

This section focuses on the major characteristics of legislation and an evaluation of the existing legal frameworks in the four case study countries.

1. GHANA

Most of Ghana's environmental legislation had its origin in the promotion of human health, the prevention of disease and the avoidance of nuisances. Laws such as the Mosquitoes Ordinance (Cap 84, 1957 Rev.), the Testse Fly (Control Ordinance 1955, NQ of 1955), the Infectious Diseases Ordinance (Cap 78, 1951 Rev.), indicate the strong public health orientation of the early laws on environmental control. The provision in Article 9(1)(e) of the 1979 Constitution, which calls for measures to promote health and the environment maintains this public health link.

Most of these laws were passed either prior to, or soon after, independence in 1957 - a good indication of the adequacy of their environmental content. There is no legislation which deals with industrial pollution, a problem which is on the rise because of an increase in industrial activities, particularly in the twin cities of Accra and Tema. The Factories, Offices and Shops Act, 1970 regulates the occupational welfare of workers and the impact of factory activities on the environment in general.

Ghana has no recent legislation on air pollution, effluent control and regulation of the use of harmful substances.[8] Neither is there legislation on marine pollution from sources other than the discharge of oil from ships,[9] or on coastal zone management. Legislative texts

on pesticides use, most of which can be found either in health or the agricultural laws,[10] generally authorize the uncontrolled use of pesticides chemicals. In fact, the 1965 Prevention and Control of Pests and Diseases of Plants Act (Act 307) goes so far as to grant powers to the appropriate pest inspectors to "apply such treatment or develop such measures as he thinks necessary for the purpose of preventing, exterminating or restricting any pest disease."[11]

The current soil conservation law - the Land Planning and Soil Conservation Ordinance, No. 32 of 1953 as amended by the Land Planning and Soil Conservation (Amendment) Act, 1957 (No. 35 of 1957) charges the appropriate authorities with the responsibility of carrying out work necessary for, inter alia, "...the mitigation or prevention of soil erosion and the reclamation of land." (S 7). Provision is made for the issuance of regulations to encourage afforestation and reforestation of land (S 11). However, no such regulations have been issued.

The existing forests legislation, The Forest Ordinance, makes provision for the creation of forest preserves and the protection of forests in general. In addition the Concessions Ordinance, as amended (Cap 136, 1951 Rev.), empowers the Chief Conservator of Forests to prescribe conditions to ensure the requisite protection, conservation and management of all forest areas to which the Ordinance applies. In 1974, the Forest Protection Decree (N.R.C.D. 243) was passed to prescribe penalties for offenses such as unauthorized felling, obstructing streams and rivers, hunting, shooting or fishing within a forest reserve.

Legislative provisions in other sectoral topics such as water resources, wildlife management and protected areas are vague with regard to their

environmental content. For example, the Board of the Ghana Water and Sewerage Corporation is granted power to authorize subsidiary legislation, taking into account, inter alia, "the prevention of pollution of water." No such subsidiary legislation has been issued as yet (although as mentioned in Chapter Three, a draft law has been prepared by the inter-ministerial Health Committee on Water Resources Development).

Two major conclusions can be drawn with regard to environmental regulation in Ghana;[12] first, there is no legal provision which establishes a national policy and environmental quality standards. Relevant environmental legislation appears either as sub-sections in the legal instruments which create key governmental or quasi-governmental institutions, or as part of the general law regulating activities in various sectors. However, even with regard to these provisions, regulations that are necessary to establish appropriate and badly needed guidelines for the implementation of the enabling laws are lacking. The only legal instrument which could be considered as a unifying thread is the Environmental Protection Council Decree, 1974, as amended. This conclusion is arrived at by inference only, as the Decree focuses entirely on the constitutional and administrative authority of the Council, rather than on a broad statement of Ghana's legislation policy for environmental and natural resources. As an example, S2 (1) (9) of the Act charges the Council with the responsibility of ensuring "...the observance of proper safeguards in the planning and execution of all development projects, including those already in existence that are likely to interfere with the quality of the environment," thereby implying that environmental questions are to be relevant considerations in the planning and execution

of projects. The EPC now appreciates the importance of the legal components of its work, and has commissioned the University of Ghana Law School to conduct a thorough review of existing legislative coverage in the field so that important gaps can be identified and filled.

2. MALAYSIA

Malaysia's legislative policy for overall environmental quality is set out in the Environmental Quality Act 1974 (Act 127). This is an enabling Act, empowering the Minister (of Science, Technology and Environment) to issue regulations with regard to the prevention, abatement and control of pollution and the enhancement of the environment.

The core section of the Act - Part IV, entitled "prohibition and control of pollution" - provides that, after consultations with the EQC the Minister may specify acceptable conditions for the "emission, discharge or deposit of wastes or the emission of noise into any area, segment or element of the environment." To date, five sets of regulations have been issued to implement the general provisions of the Act. These regulate pollution from the palm oil industry,[13] the rubber industry,[14] the discharge of sewage and industrial effluents,[15] air pollution,[16] and general licensing requirements.[17]

In implementing these regulations, the DOE is preoccupied with striking a balance between the practical and technological feasibility of the pollution control measures and the need to prevent or avoid environmental hazards. While this is a laudable objective, its actual implementation appears to be heavily weighted in favor of the industries. The DOE is particularly keen on granting industries time[18] to develop pollution control technology and claims that there are enough incentives

(waivers) and deterrents (fines) to create a climate which will encourage the development of appropriate technology and treatment processes.[19] In fact, there are some impressive examples in the palm oil industry which support this claim [20] but these are isolated examples that bear little relationship to the stringency of the Regulations. For example, the palm oil industry has no guidelines for mill owners which provide information on the kinds of treatment processes that will meet the DOE's standards. The DOE has been unable or unwilling, it is not clear which, to publish evaluations of any particular technology, or waste treatement processes, that will meet its standards. The reason given is simply that the DOE does not have such a responsibility nor can it be seen to be patronizing any one method - a rather unsatisfactory situation which, if true, seriously hampers the ability of the DOE to issue appropriate environmental criteria.[21]

The situation with regard to sectoral regulation is much more complex. As most of the natural resource sectors (land use, water, forests, mining) are under state jurisdiction, there is a variety of legislation relating to these topics which continue to remain in force.[22] Some of them are complementary to the Environmental Quality Regulations,[23] some are in direct conflict [24] while some pose potential conflicts of jurisdiction. Most of these legislative texts (enactments) were passed prior to the adoption of the National Environmental Policy (which stressed forestry, land use, wildlife, natural resources and ecosystem management as important objectives for social and economic development). Although these laws have benefitted from regular amendment, the standards they set are usually outdated. Most were passed as a measure to promote

uniformity - the intention being that all the state governments will adopt and incorporate them into their legal systems. This has been achieved to a large extent, but there are still a few laws which have not been adopted by all states. With regard to the two semi-autonomous states of Eastern Malaysia, these laws do not even apply. To compound matters further, enforcement of such laws is haphazard, especially in the forestry sector.[25]

A major problem involves the dearth of guidelines on national environmental and natural resource management goals. This poses a risk of the adoption of varying standards nationwide, or no standards at all. Particularly pertinent is the case of those subject areas which fall under state jurisdiction. While the early laws may have been adequate to regulate the then prevalent environmental problems, the standards they set have, in most cases, been overtaken by current environmental concerns arising from increasing demands on natural resources. Hence, environmental standards which were thought to be adequate 50 years ago certainly require revision to meet present day minimum standards. A very good example is the standard for the discharge of mining effluents and overburden into rivers. This sets a minimum limit of the equivalent of 11,000 parts per million of suspended matter,[26] as opposed to the minimum limit of 500 ppm. in the regulations issued under the Palm Oil Regulations.

Malaysia's legislative framework for environmental management, although much more comprehensive and up to date than Ghana's, still suffers from some deficiencies inherent in the overall management system. The system is a complex medley of divided authority in some cases, overlapping responsibility in others, haphazard legislative coverage in others and serious gaps in a few others.

3. THE SUDAN

The Sudan has not promulgated any comprehensive environmental and natural resources legislation. Legal measures for environmental management have been effected on a piece-meal, sectoral basis, as needs arose. One of the earliest environmental laws, the forests law, was enacted in 1932. The main laws on forest management are:

1) The Central Forests Act, 1932

2) The Provincial Forests Act, 1932

While there are other pieces of legislation which have a bearing on forest management, their environmental content is weak.[27] Both Forest Acts provide for the creation of forest reserves, with little articulation of required management-oriented forestry practices. This system has its limitations, especially as the legislation does not apply to non-reserved lands. A study conducted by the FAO proposed the formulation of a more comprehensive legislation which sets forth overall national forestry policy.[28] As a result a Draft Forest Act has been prepared. This draft law makes provision for a more progressive notion of forest protection. Although it still provides for the establishment of reserves, the purposes of these reserves include not only production, the protection, recreation, grazing and farming as well. No action has been taken on this draft law. Passage of this law appears to be awaiting outcome of the decentralization programmes.

Legislation in the other natural resources sectors is similar to that for forestry. In the majority of cases, there are no specific texts dealing with the management of a particular natural resource - the only exception is wildlife and fisheries protection.[29] Laws making provision for such matters as soil conservation or water resources manage-

ment are mainly peripheral. For example, although there is no specific text setting out soil conservation policy, references to soil conservation are made in no less than four Acts.[30] The 1967 Rural Water and Development Corporation Act gives the corporation responsibility for the "protection of resources, pastures, agricultural lands, soil and Sudan tree wealth" from deterioration. There is no indication, in terms of regulation or rules issued by the corporation as to how this duty is discharged or the appropriate standards.

Even with regard to those sectors where direct legislation exists, they have not kept abreast with developments because necessary regulations have not been issued. Fisheries protection is an example. The two basic laws are Marine Fisheries Ordinance, 1937 and the Freshwater Fisheries Ordinance of 1954. The current six-year development plan calls for a completion of fish resource surveys.[31] Once this has been achieved, a comprehensive fisheries management law (which the current laws do not provide) will be required, as will national and local networks of competent fisheries administrative authorities.

Similar examples of gaps in legislative coverage or enforcement exist with regard to coastal zone management, land use planning, water resources and other such resource management sectors.

Two of the newest pieces of environmental legislation are the Environmental Health Act, and the Public Health Act, both passed in 1975. The Environmental Health Act defines institutional responsibilities for water and air pollution. By far the most noteworthy provisions appears in s.4, which imposes a duty on local councils to preserve and improve environmental health, defined as "health condition of a

human being, an animal or a plant and all that is related to human life in the surrounding environment." These councils are also required to make adequate provision for the installation of public sewers, the disposal of rainwater and untreated wastes, the collection and treatment of wastes, etc., and to take preventive measures against the spread of epidemic diseases. The Act imposes considerable obligation on the People's Council, and yet the only guidance the Council is given comes in s.5, which states that they may issue regulations or instructions for the implementation of their duties, acting upon the recommendations of the Minister of Health and the Public Health Board, a creation of the new Public Health Act. Under s.5 of the Public Health Act, one of the major functions of the Public Health Board is the establishment of environmental health standards and the provision of technical advice to the local Government Councils.

While these two Acts are important first steps for promoting environmental health and pollution control in general, they by no means give the subject exhaustive treatment. In light of the magnitude of the country's environmental health problems and the perennial problems associated with administration in the Sudan (lack of coordination, lack of definitive national policies to guide local authorities), these laws may pose more problems for the already stressed local authorities than they solve.

A cursory lock at the number of legislative texts with relevant titles covering natural resources and environmental issues gives one the erroneous impression of an adequate legislative coverage.[32] The abundance of legislation in the water resources sector is the outcome

of the need for strict monitoring of the use of the Sudan's allocation of Nile Waters under the 1957 Agreement between Egypt and the Sudan.[33] Thus, although it may appear that there is ample coverage, it is necessary to stress that, with few exceptions, the relevance of these laws is peripheral, incidental or by implication only. There is no definitive declaration of environmental quality criteria, for example, and there are very few regulations which give badly needed guidelines for implementing these laws by local authorities.

4. VENEZUELA

As far as general environmental matters are concerned, the two main pieces of legislation are the Environmental Law (Ley Organica del Ambiente, 1976) and the Central Administrative Law (Ley Organica de la Administracion Central 1977), the combined effect of which endowed the Ministry of Environment and Renewable Natural Resources (MARNR) with powers to regulate activities in the environmental field. To date, five sets of regulations have been issued, the most important being the Water Resources,[34] and the Harmful Noises regulations.[35]

With regard to water resources, MARNR shares its responsibilities with the Venezuelan Corporation of Guyana (construction of hydroelectric dams) and the Ministry of Agriculture and Cattle Raising (small rural projects). With the exception of these two types of water resources development projects, MARNR actually implements all hydro projects in the country (this is effected through the National Institute for Sanitary Works, which has a financial allocation amounting to 70% of MARNR's total budget). The water regulations are classified into seven

types according to use: human consumption, irrigation, aquaculture, recreation, industrial, navigation, and transportation. The aim is to assign a use to each basin or part of a basin with necessary adjustments in individual cases (art. 20). However, progress on this project has been slow due to the scarcity of trained personnel and of updated information to determine the actual classification of uses. The formulation of a number of national norms for action in critical areas such as the Maracaibo and Valencia Lakes has been completed. MARNR's main task is the supply of water to the heavily populated and industrialized urban areas of the North Central Region and Caracas.[36] No information is available yet on the operation of these regulations.

With regard to noise pollution, the 1979 regulations attempt to regulate aircraft and motor vehicle noise and authorize the appropriate authorities to declare special noise protection areas (art. 22). Stringent regulations were thought necessary because of high noise pollution levels in Caracas.[37] There is little information on the enforcement record of these regulations.

There is no air pollution law. However, a tentative Plan of Regulations on Control of Air Pollution by Chemical Agents (Anteproyecto de Reglamento sobre Control de Contaminacion Atmosferica por Agences Quimicos) has been established. Also MARNR has promoted air pollution control studies on the environmental risks of petrochemical plants.

As far as legislation to deal with environmental management in other sectors is concerned, the operative law is the Forestry, Soils and Water Resources Law (Ley Forestal de Suelos y Aguas), 1965. As of 1977, MARNR has replaced the Ministry of Agriculture and Cattle

Raising in performance of the numerous responsibilities set out in this law. These include, inter alia, control of deforestation, reforestation programmes and administration of forests in general. Regulations were issued under this Act in 1977. These regulations specify criteria for the creation and administration of national parks;[38] determine the meaning and scope of protected areas and river basins; regulate the use and development of forest resources in public and private land, and the use of agricultural land; the protection of watercourses and navi- gable rivers; and the criteria for authorizing urban land uses in forested areas. MARNR faces a formidable challenge in discharging these duties, if forestry and agricultural production are to be maintained on a sustainable yield basis. A MARNR study has shown that in order to meet the demand in the year 2000, Venezuela should manage 10 m. hectares of natural forests and 1.3 m hectares of new plantations.[39]

This major focus on the resource management activities of MARNR gives a misleading impression of harmony and belies the fundamental flaw in Venezuela's legal system for environmental management: environmental policies in Venezuela are managed by a large number of public agencies. Given the insufficent, diverse and sometimes conflicting legislation supporting the activities of the agencies, the solutions adopted are partial and unsatisfactory. Apart from the main problem of conflicting jurisdiction and objectives, the large number of uncoordinated laws is a major contributing factor to the relatively low level of environmental management that is being achieved. Most of these laws have arisen from a long history of de facto government, in which all legislation was passed by Presidential Decree, in order, as one critic put it, to

maintain "the appearance of a state of law."[40] MARNR has almost completed the mammoth task of compiling and correlating the 500 odd environmental norms. The situation has best been summed up by one critic who says: "in Venezuela, nobody believes in the law and, precisely for this reason we pass many laws....in Venezuela, we believe the problems are solved by issuing Decrees, passing laws or creating new administrative agencies."[41]

General Conclusions

From this review of the existing legislation in the four study countries, the following conclusions seem relevant. Most countries have a plethora of legislation relating to environmental questions. Despite this abundance of legislation, it is clear from the gravity of environmental problems both in the individual study countries and globally[42] that the impact of law on environmental management has been minimal. The two major reasons for this are: (1) the inadequacy of the legal provisions themselves, or (2) lack of enforcement.

With regard to inadequate legislative coverage, outmoded legislation is the main culprit. As an example, it is doubtful whether forestry legislation approved in the 1930's will contain appropriate provisions to meet the present day needs for legislation in that sector. Both scientific and technological advances in that sector, as well as attitudinal changes which place much heavier emphasis on social or community forestry, mandate a concomitant modification in the legal provisions. Second, because of the different focus in many countries' development policies, new, different and often more severe types of environmental problems are on the rise. These call for a revision of existing texts

or, should the need arise, the promulgation of new sets of laws. Third, because of the variety of sectors and subject matters which fall under the ambit of environmental management some degree of proliferation of laws is inevitable. The risks of establishing conflicting standards, overlapping jurisdiction and competing responsibilities are intensified. Where these difficulties are not identified and rectified, no volume of legislation can eradicate them.

As far as lack of enforcement is concerned, the causes are more varied and complex. In some cases, enforcement is erratic because environmental law has not been clearly understood as a management tool.

In other cases, inertia in enforcement exists because government or business practice is characterized more by mutual cooperation and well-established relations than by legislation. Litigation in this field ranges from sporadic to virtually non-existent. In other cases, the standards set by laws are so stringent and ambitious as to make enforcement almost impossible. For example, Egypt has had to revise its industrial pollution laws in order to gain more compliance from industries.[43] Conversely, laws may provide for weak penal provisions which make enforcement ineffective. Often, enforcement of laws depends on either political will or whim. Obviously where a country does not consider a problem to be serious enough, the allocation of resources for enforcement of legislation in that sector will be low. In some other cases, especially the enforcement of forestry and other natural resource legislation, enforcement is hampered by the lack of required manpower or equipment. In a few cases, the procedure for enforcement may be so tedious as to deter or dampen any enthusiasm for implementation. As the case

of Venezuela illustrates, the tradition in a country may be so wedded to the concept of lawmaking that actual enforcement is relegated to second place. Finally, some enforcement problems are particularly acute, depending on the nature and type of government administration itself, as the problem with state level enforcement or federal laws in Malaysia illustrates.

Apart from the specialized environmental problems in urban/industrial areas, the bulk of environmental management activities (regarding such problems as forestry, wildlife, range and pasture management and soil conservation) take place in rural areas which are very often removed from the center of government administration. Enforcement of laws in these areas depends on practical considerations such as the availability of personnel (foresters, game wardens, agricultural extension officers, sanitary inspectors) and the other support systems (vehicles, monitoring equipment, etc.). Given personnel and equipment shortages, the problems of local level enforcement are a serious handicap in both highly centralized and decentralized systems of administration.

FOOTNOTES - CHAPTER FIVE

1. Schmithusen, Franz. "An Annotated Bibliography on Forest Legislation in Developing Countries," FAO, Legislative Branch, Background Papers No. 12, 1977.

2. FAO, Legislation Branch. "Wildlife and National Park Legislation in Asia," by G. Knopp, Legislative Study No. 1, 1971; "Wildlife and National Parks Legislation in Latin America," by G. Kropp, Legislative Studies No. 2.

3. FAO, Irrigation and Drainage Papers No. 20, "Water Laws in Moslem Countries," Vols. I and II, 1975; Legislative Studies No. 8, Legislacion de Aguas en America Central, Caribe y Mexico, 1975; No. 17, "Water Law in Selected African Countries," 1979; No. 19 "La Legislacion del Agua en los Paises de al America del sur," 1980.

4. The early forestry legislation is an example of the former while wildlife legislation is usually more of the second type of legislation. See supra footnotes 1,2, and 3. Also Hassan, Pavez. "Status of Environmental Protection Legislation in the ESCAP Region," Bangkok, 1978.

5. Presidential Decree No. 705 as amended by Presidential Decree No. 1559, 1978.

6. The United Nations World Health Organization's International Digest of Health Legislation (31 volumes) contains comprehensive up-to-date information on this subject.

7. See e.g. Harris, M. "The Institutional-Legal fact of the Environmental Coin," 54 Nebraska Law Review, 1975, p. 229; Palasi, Villan. "Legal Aspects of the Conservation of the Environment," International Law Association, London, 1979, p. 34; Weersinghe, O., "Adopting Laws and Administration to Improving the Human Environment," Earth Law Journal, Vol. 2, 1976, p. 121.

8. The existence of Laws such as the Radioactive Minerals Ordinance Cap 151 (1957 Rev.) and the Atomic Energy Commission Act 1963 (Act 204) indicate the fact that the potential for such pollution exists. To date no environmental health regulations have been issued under these laws.

9. The Oil in Navigable Waters Act, 1964 (Act 285) giving effect to the 1954 International Convention on the Prevention of Pollution of the Sea by Oil.

10. Such as The Fruit Industry Decree, 1969 (N.L.C.D. 356); and the Prevention of Damage by Pests Decree, 1968 (N.L.C.D. 345).

11. Section 8(1).

12. A more thorough description has been prepared by the University of Ghana Law School on behalf of the EPC. Also see Djarbeng, E., "Environmental Protection Legislation in Ghana and Strategies for the Future." Country paper presented at the ECA/UNEP seminar for lawyers on the Development of Environmental Protection Legislation in Africa, Addis Ababa, September 29-October 3, 1980.

13. Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977 P.U. (A) 342.

14. Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations 1978, His Majesty's Gazette P.U. (A) 338.

15. Environmental Quality (Sewage and Industrial Effluents) Regulations 1979, His Majesty's Gazette, P.U. (A) 12.

16. Environmental Quality (Clean Air) Regulations 1978, His Majesty's Gazette P.U. (A) 280.

17. Environmental Quality (Licensing) Regulations 1978, His Majesty's Gazette, P.U. (A) 198.

18. A very good example is the Crude Palm Oil Regulations, which gave the Palm Oil industry almost three years (until July 1980) to attain an acceptable level of effluent discharge - Palm Oil mill effluent must meet a Biological Oxygen Demand (B.O.D.) limit of 1000 mg/l.

19. Maheswaran, A. et. al., "Water Quality Management in Malaysia," D.O.E. Kuala Lumpur, July 1980.

20. Antara Oil Palm Pollution Control Sdn BHd, "Advances in Palm Oil Effluent Control Technology." Paper presented at DOC/IDRC Seminar, November 18, 1980.

21. Although a review of the Environmental Quality Act leads to the conclusion that, if the DOE indeed does not have such power, at least the Minister has some residual powers to issue regulations. Support for this view is found in Section 51 (1) (b) which states that, "In addition to and not in derogation of any of the powers contained in any other provisions of the Act, the Minister after consultation with the Council may make regulations for or with respect to.....

(b) Prescribing standards or criteria for the implementation of any declared environmental policy or classification for the protection of the environment and for protecting beneficial uses; This provision can certainly be invoked to sanction the D.O.E.'s listing approved of Palm Oil effluent treatment technology.

22. See Shane, Jeffrey N. "Legal Aspects of Environmental Management in Developing Countries of South East Asia" 1979.

23. For example, the control of air pollution made under the Road Traffic Ordinance, 1958 - Motor Vehicles (control of smoke and gas emission) Rules, 1977, His Majesty's Gazette P.U. (A) 414.

24. Mainly because they issue different, often low standards; for example in the control of effluents from such industries as mining under the Mining Enactment, 1927, (F.M.S. Laws Cap 147).

25. As is illustrated in the rapid rate of deforestration. For further information see: Consumers Association of Penang (CAP), "The Malaysian Environment in Crisis," selection from press cuttings, Penang, Malaysia, September 1978.

26. Supra, note. 24 S74 and Rule 13.

27. FAO "Report to the Government of Sudan on Forestry Education and Legislation for Local Community Development," Rome 1979.

28. Ibid, p. 19.

29. E.g., The Preservation of Wild Animals Ordinance, 1935 as amended, and regulations made thereunder. See also FAO "Wildlife and National Parks Legislation - Report to the Government of the Sudan," Rome 1974.

30. 1) The Rural Water and Development Corporation Act 1967

2) The Allotment of Lands for Development of the Mechanized Farming Corporation Order, under the Mechanized Farming Corporation Act

3) Parts of the National Parks, Sanctuaries and Reserves Regulations 1939, issued under the Preservation of Wild Animals Ordinance, 1918

4) The Gezira Scheme Act, 1960

31. Democratic Republic of Sudan. "The Six Year Plan of Economic and Social Development 1977/78 - 1982/83, Vol. 2, p. 12.

32. A total number of forty-two laws were identified for this report. An FAO review of water resources legislation itemized seven different laws relating to the subject. See Dante Caponera, "Water Laws in Moslem Countries," Vol. 2, Irrigation and Drainage Paper No. 20/2, FAO, Rome, 1978 at p. 259.

33. For a good description of this Agreement and its implications for water resources management in the Sudan, see Waterbury, John. "Hydro-politics of the Nile Basin."

34. Regalmento No. 5 de la Ley Organica del Ambiente sobre Clas-sificacion de las aguas.

35. Reglamento No. 5 de la Ley Organica del Ambiente Relative a Ruidos Molestos o Novicos, November 19, 1979.

36. It is anticipated that by the year 2000 betwen 9.6 and 10.2 million people will be living in this region. MARNR "El Abastecimiento del Agua a le Region Central, Formulacco de las Opciones Factibles" in Documento Prelimiar, Caracas, November 9, 1979. See also CICRED "Comite Internacional de Coordinacion e Invetigaciones Internacionales en Demo-grafia la Policion de Venezuela, 1974."

37. Caceres, Rafael, "Estudio Integral sobre la Contaminacio Atmosferica en el Valle de Caracas," MARNR, 1979 p. 85.

38. In 1978, seven national parks and four national monuments were created, covering 4.7 million hectares.

39. MARNR "Diagnostico, estrategias y politicas del subsector forestal," 1979.

40. Sosa, Cecilia, "El regimen de sanciones en materia de ordenacion del territoria," MARNR, March 1980 p. 3.

41. Meier, Henrique, "El derecho ambiental en el regimen social Vene olano." Lecture given on June 13, 1979, at the VII National Convention of Forestry Engineers, mimeo, MARNR, 1977, pp. 3,4, and 5.

42. Individual country legal studies have been prepared by UN/ESCAP, UN/ECA, FAO and the IUCN.

43. See World Environment Report May 5, 1980, p. 5.

ADDITIONAL READING

Barret, Ian. "Environmental Legislation with Particular Reference to Kenya, Tanzania, Zambia and Botswana."

FAO. "A Legal and Institutional Framework for Natural Resources Management." Prepared by Guillermo J. Cano, Rome 1975.

_____.Legislation Branch, Background Paper No. 2, Rev. 1 1975 -- "A Summary of the Current Activities of the Food and Agricultural Organization of the United Nations as Regards the Legal and Institutional Aspects of Water Resources Management," by the Agrarian and Water Legislation Section.

International Association for Legal Science (IALS). "Legal Protection of the Environment in Developing Countries." IALS, Mexico, 1976.

Jensen, Dallin W. "Some Legal Aspects of Water Resources Management." Public Administration Review, Vol. 37, September/October, 1977.

Sabatier, Paul. "Regulatory Policy-Making: Toward a Framework of Analysis." 17 Natural Resources Journal, 1977, p. 5.

Schmithusen, Franz. "Logging and Legislation as Considered in the Cameroon, the Congo, Gabon and the Ivory Coast," UNASYLVA, Vol. 31, No. 124, 1979.

United Nations Economic Commission for Africa (ECA). Documents presented at Seminar for Lawyers on Development of Environmental Protection Legislation in the ECA Region. Addis Ababa, 29th September - 3rd October, 1980.

United Nations Economic Commission for Asia and the Far East. "Guidelines for the Drafting of Water Codes, Water Resources Series." No. 43, New York, 1977.

United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Documents for ESCAP/UNEP Intergovernmental Meeting on Environmental Protection Legislation, 4th - 8th July, 1978.

UNEP. "Manual on Environmental Legislation." Nairobi, February 1977.

SECTION THREE - ENVIRONMENT MANAGEMENT NEEDS AND STRATEGIES

...Needs for environmental management are discussed. Of particular import are: the need for an adequate information base; the need for public participation; the need to resolve constitutional and such jurisdictional problems which are raised by competing bureaucracies; the need for an adequate legislative policy; and the need for trained manpower resources. Finally, a discussion of traditional resource management systems...

CHAPTER VI

ENVIRONMENTAL MANAGEMENT NEEDS - CONSTRAINTS AND OPPORTUNITIES

Before embarking upon a discussion of needs, it should be stressed that environmental and natural resource management policies, laws and institutions have brought about some remarkable successes in the developing world. In some countries, the success lies in the sharpening of the policy focus to better define the linkages between environmental and development goals in order to provide a sound footing for integrated environmental planning and management. Venezuela's incorporation of environmental planning within its national development planning system has, to a considerable degree, provided the support base for environmental management. In some countries, a dramatic reduction in some of the most serious sources or types of pollution has resulted. For example, Malaysia's pollution control regulations under the Environmental Quality Act have not only resulted in relatively cleaner watercourses but have also induced the development of an indigenous pollution control technology. Some companies even claim major breakthroughs in the development of processes which, by separating solid wastes from liquid effluents, have a high potential for the conversion of these solids

into animal feed. According to some estimates, if all the palm oil mills in Malaysia, a total production of 6 m. tons of palm oil effluent a year, were to adopt this treatment process, about 120,000 tons of animal food could be produced.[1] As Malaysia is the world's leading producer of palm oil, the potential for the export of this product and indigenous technology may be very considerable. In some cases, some notable, practical and badly needed attempts at coordination of various government activities in a particular sector have been effected. Ghana's Health Committee on Water Resources Development is an example in point. By bringing together the majority of government agencies with fragmented or overlapping responsibility for water quality control, this committee has been able to prepare some water quality criteria and to prepare a draft water law. In some other sectors. the identification of problems requiring priority attention has enabled sectoral management institutions to focus attention and limited budgetary and manpower resources on these problems. This approach is best exemplified by the work of the Sudan's Range and Pasture Administration in its efforts to control seasonal fires. Fire lines - bare spaces (sometimes even roads or railway lines) were created between rangeland areas to prevent fires from spreading. The Administration's method has been to encourage the involvement of local people in this programme in order to meet the high manpower needs required. At the same time, it is conducting research into the potential for other (faster) methods such as the use of low residue chemicals.

Unfortunately, the lack of appropriate policy, lack of adequate legislation or its enforcement, and the harsh realities of economic, technical and manpower limitations on environmental management in

many other instances have created a situation where the failures in, or lack of, adequate environmental management outweigh the successes. Also, in certain instances, governments and institutions have been unable to take advantage of some opportunities (such as traditional resource management systems) which can improve a country's overall management system or its management programme in a certain sector. The rest of this chapter examines these constraints and opportunities and thereby identifies those unmet environmental management requirements.

A. Adequate Information Base

According to the World Conservation Strategy (WCS), lack of environmental planning and of rational use allocation is one of the main obstacles to achieving good environmental management. Accurate information about the nature, extent, characteristics, carrying and receiving capacity of the resource base of a particular country or region ("ecosystem evaluation") is one of the major prerequisites as to how best to allocate resource use as well as establish standards and criteria for resource base maintenance. The fact that many countries lack information from which environmentally sound resource planning and use decisions can be made is evidenced by the selection of ecosystem evaluation as one of the main actions required under the WCS's priorities for national action.

The problem is particularly acute with regard to land capability and actual use, which plays a pivotal role in assuring environmental integrity. The debilitating impact of this handicap has been pointed out with regard to the problems faced by the Sudan's Natural Resources Administration. Adequate information is also required in order to

make key decisions on topics like coastal zone development, reforestation or afforestation programmes, and the establishment of critical pollution levels in either fragile or balanced ecosystems. In the developing world in particular, information about the properties and behaviorial characteristics of important natural resources (soils, water, fisheries, national forests) is crucial because so much of their economic development objective depends on the sustained productivity of these resources.

Some initial steps have been taken to meet this need in many countries. Land classification surveys have been done for various regions in both the Sudan[2] and Malaysia.[3] With the help of various U.N. agencies, countries have been conducting important studies like hydrological surveys, fisheries development potential and aquaculture etc. Nevertheless, unless there is a systematic drive not only to evaluate resources and their environmental impact, but also to incorporate such information in the planning phase of development decision-making, even well-intentioned environmental laws, institutions and programmes will have little positive impact.

Having accepted the need for an expanded information base, the major question becomes how extensive and detailed a process should this information-gathering involve? Manpower, financial and often time (urgently needed to meet development targets on a foreign investment opportunity) constraints may feature prominently in the decision as to the comprehensiveness of the information gathering and evaluation that is performed. And undoubtedly, priorities will have to be set in the different sectors as to which types of information are necessary or are appropriate in a given situation. Countries have a variety

of processes to choose from: resource inventories, baseline studies, environmental assessment (the nature and impact of activities on human well-being and ecosystems) are all methods that can be deployed for environmental planning and rational resource allocation. In a surprising number of situations, the information exists but is not put together in usable form. Thus, whichever procedure is adopted should be designed to ensure not only the improvement of the data base but to ensure easy access and retrieval as well.

The next important policy decision to be made relates to the degree of detail of such information. This question will depend on the level at which such information is required. Information may be required for regional planning, for sectoral policies, or for particular projects. Whatever level is appropriate should not have any impact on the level of professionalism or the multidisciplinary approach that is required. The most important consideration is that the information is adequate to allow a sound threshold decision to be made in as many sectors as possible. As the WCS puts it, "it is preferable to achieve coverage at the expense of detail, rather than the other way round."[4]

In some instances, the information exists but is filed away in the libraries of various international agencies or consultants. Organizations like the FAO, UNESCO, WHO, World Meteorological Organization (WMO), UNEP, IUCN, and the United Nations' regional economic commissions have amassed considerable volumes of information regarding natural resources and environmental factors over the years. In addition, organizations like FAO and IUCN have offered countries assistance on such pertinent questions as wildlife management, fisheries management, forestry activities, soil conservation, water resources, etc. These

information resources extend to the legal and institutional aspects of environmental and resource management. A great opportunity exists for countries to tap these information resources, or at least to enlist some support from them in providing assistance with the methodologies for data assessment.

B. Constitutional and Jurisdictional Problems - Competing Bureaucracies

Examples of these problems have emerged in earlier chapters, especially Chapter Four. Problems involving the delineation of responsibility among the various levels and arms of government abound in all types of government structures irrespective of the country's level of economic development. Obviously such problems tend to be more acute in countries with decentralized systems of government. In Australia, it is the states which have ultimate control over environmental matters. In the Commonwealth's (federal government's) attempts to coordinate states' activities, a two-tier institutional structure is established at the federal level - the main environmental departments and the councils of state - or ministries.[5] The main difficulty becomes the assertion of federal supremacy over environmental matters. In Malaysia, the constitutional provisions, which grant ultimate control over the majority of natural resource issues, have rendered federal/state interaction an intractable problem. Some countries, such as the Federal Republic of Germany, have resolved such problems by constitutional amendment.[6] It is clear, however, that this course of action is not only drastic but time-consuming. An assessment of Malaysia's compromise solution - the provision of federal guidelines for use in state-authorized activities - is premature. Information on how these guidelines have fared is quite inconclusive.

Another dimension of this jurisdictional problem, the division of responsibility among various government departments, has also been discussed with reference to the four case study countries. While this problem permeates all sectors of government, it is of crucial significance in environmental management, the success of which depends as much on a general understanding of the concept of environmental interconnection as on anything else. Countries such as the United States have sought to improve this understanding by means of governmental advisory bodies, such as the Council on Environmental Quality (CEQ).[7] As mentioned earlier, one realization which emerged from the Stockholm Conference was the need for a focal point within government administrations, not only to coordinate environmental activities, but to review the effective implementation of the environmental policies which governments adopted. Many approaches were utilized. Interdepartmental coordinating councils were set up by some countries. Others established new ministries. In yet a few other countries, existing ministries were given new environmental responsibilities. But, because of the prior existence of many institutions with related environmental or resource management functions, the creation of an entity with environmental responsibility tended to arouse suspicion - each existing institution being on guard to avoid ceding any of its powers.

In some cases, the new environmental institution has managed to establish a fairly smooth working relationship with other government agencies. The Malaysian DOE's relationship with the Department of Transportation, the Ghanaian EPC's relations with the various Government of Ghana agencies involved in water resources development programs are two examples. However, in the majority of cases, the result of

conflicts has been that newly created environmental institutions are forced to focus on narrow pollution issues - an approach which minimizes friction because it usually involves no usurpation of powers.

These constraints point to two distinct, yet interrelated, needs as far as the institutional framework is concerned:

1) a need to examine the role of all institutions, to iron out jurisdictional conflicts or overlaps in order to streamline the administrative system.
2) a need to improve the overall performance of all related institutions.

One approach could be the drawing up of a list itemizing all environmental management responsibilities and institutions responsible.

Generally speaking, the institutional functions required for environmental management include:

--policy formulation

--advisory functions

--policy coordination and oversight

--establishment of environmental quality standards

--environmental regulation, monitoring and enforcement

--research, analysis and reporting

--environmental planning and impact assessment

--education and training

Additional functions may be required in situations where specific duties have been defined, for example at the project level. Further, institutional needs will differ, depending on the sector under consideration. For example, the health sector may require more and more different types of monitoring -- air and water quality product safety, etc. than

other sectors. The industry sector may require more varied types of environmental planning and impact assessment than other sectors. By virtue of the multiplicity of concerns, subject areas and projects (such as foresty, fisheries, soil conservation, crop production, irrigation, wildlife protection, road construction, construction of dams, mining, etc.) it is inevitable that differences in focus occur. Thus, a necessary requirement ought to be an assessment of a country's institutional needs. This having been done, each country will then have to sort out so as to get agencies to establish their own priorities. Afterwards, the government should decide on the allocation of resources (financial and manpower) necessary to meet these needs. Emphasis will have to be placed on strengthening the authority of the main environmental institution which is to be the focal point of activities in this field. This will provide what is perhaps the most important institutional requirement, "....a permanent mechanism for joint consultation on and coordination of both the formulation and the implementation of policies."[8]

C. Public Participation

A well-informed public plays an important role in the effective functioning of any management structure for environmentally integrated development. In fact, it enriches it in more ways than one. An improved information base should lead to heightened sensitivity about environmental issues and their interrelationships. This in turn should lead to responsiveness and consequently demands for accountability from decision-makers in the management structure. Experiences in the developed world have illustrated the beneficial impact on environmental management of a well-informed and responsive public. The arousal of environmental

consciousness in the late 1960s and early 1970s was very much the result of such public awareness and responsibility.[9]

If local inhabitants understand the need, for example, for forestry conservation for their own future needs, they may be more willing to modify their activities in the short term in order to comply with resource management programmes. It is the realization of this link between an improved knowledge base and the success of programmes that has led to an unprecedented effort to integrate forestry into rural development through what is now known as "community foresty."[10] The World Bank,[11] FAO and US AID are among the development institutions which have adopted, or have expressed an intention to adopt, this approach. In the developing countries, the beneficial impacts of such heightened awareness of environmental matters are beginning to emerge. A good example involves the debate over the desirability of the Silent Valley Hydroelectric Project in India.[12] Public concern over the project (which was intended to produce electricity as well as provide irrigation water for 10,000 hectares of land) arose from the fact that the project was to be located in the center of an extensive belt of pristine forest.

Closely associated with the topic of increased awareness of environmental issues is the role of non-governmental organizations. In two of the countries studied, non-governmental organizations devoted mainly to environmental protection have been very active as the environmental conscience of development decision-makers. The Malaysian Consumers Association of Penang (CAP) and Malaysia Friends of the Earth (FOE - Sahaba Alam Malaysia) have devoted considerable attention to publicizing environmental problems in Malaysia. While much of CAP's work is focussed on responding to consumer complaints, conducting surveys and testing, it is also engaged in carrying out an extensive

education programme, holding seminars and producing radio shows, all on the subject of environment. A film and a book describing the environmental crisis in Malaysia[13] are among the Association's well-known works. The Environmental Protection Society of Malaysia is a much smaller organization which, by virtue of the vitality of its leadership, has had an impact which is far in excess of its actual size.[14] This Society has publicized environmental problems through press statements,[15] surveys, seminars and the publication of a Quarterly, "Alam Sekitar" (since 1976) which provides information on a wide-range of environmental problems. The Malayan Nature Society, founded in 1940, has been a useful force in diseminating information on Malaysian ecology. In the Sudan, the Society for the Protection of the Environment has as its major objectives the dissemination of information on the country's environmental problems and the exertion of influence on the decision-makers of the country. Of particular interest here is the fact that, although a non-governmental organization, this Society contains many prominent government officials, and it appears that the Society may be more effective in producing policy coordination on some environmental issues than more formal channels.

All over the developing world there are examples of NGO's active participation in environmental issues. In Latin America the Colombian Ecological Action Committee monitored the Environmental Impact Assessment which was done for a proposed sulphuric acid factory.[16] In India, the Chipko[17] movement, which arose from local inhabitants' discontent with the negative impact of rapid development on their economic well-being and environment, now has a large following in the mountainous region of Uttar Pradesh State. The movement advocates a reform in

forest policy so that local people will play an active part in managing their own forests.[18] The activities of other NGO's in all parts of the developing world are being chronicled by the Environment Liaison Center in Nairobi.[19]

In most of the countries where such NGO's are active, there is every indication that they are beginning to adopt the activist, confrontational approach that appears to be a distinctive feature of environmental NGO's in the West, particularly the U.S. Whether or not that adversarial approach is conducive to effective environmental management and whether it will survive the political climates of most developing countries is open to debate. Their existence is an important component of the environmental management process, particularly in the developing countries, where they fill a serious gap by providing education and public information.[20]

D. Legislative Policy and the Role of Law

The role of law as an environmental tool poses a major challenge to decision-makers and law enforcement officers in the developing countries. In Chapter Five, the lack of an environmental jurisprudence and lack of enforcement of existing environmental laws were pointed out as the main reasons for the relatively mediocre performance of law as an environmental management tool. But perhaps a useful discussion on developing countries' needs in this field should commence with a critical evaluation of the state-of-the-art in environmental law. This exercise is necessary if the fundamental precepts on which environmental law is based are to be evaluated. Also, it will provide an easy methodological approach to finding a solution.

A logical starting point is the policy base for environmental law. With very few exceptions in the developing world (Venezuela and the Philippines, for example), the policy base for environmental law is either not well-developed or has not kept abreast of development in the scientific aspects of the management of resources in a given sector. The outmoded legislation in the forestry sector in Ghana, Malaysia and the Sudan supports this argument. These laws do not reflect the state of knowledge in the appropriate sectors. Further, environmental law is usually rule-oriented, attempting to solve problems by merely enacting laws.[21] A good illustration of these characteristics of environmental law can be found in Ghana's Forest Protection Decree, 1974 (NRCD 243). Contrary to what one might expect from the title, this law is devoted solely to the definition of forest offenses within forest reserves and the establishment of fines. In no way does it incorporate the Forestry Department's forest policy. As such, it is prohibitive rather than permissive. For example, S1(1)(b) makes it an offense to cultivate any farm without the authority of the competent forestry agency. As mentioned earlier, the Forestry Department has now adopted agro-forestry as a major component of Ghana's forestry policy. A more management-oriented law, couched in terms of the conditions under which farm cultivation in forested areas will be allowed, would be a more appropriate, even educational, approach. Local inhabitants would have a clearer indication from the outset of what activities are likely to comply with the law, rather than be faced with an absolute prohibition. In this regard, the provision referred to earlier in the Philippines Revised Forestry Code is a useful model.

Another characteristic of environmental law is that it is usually fragmented. Laws are passed to deal with particular problems as they arise, and there are few coalescing sets of laws which describe government policy in a given sector and set appropriate standards. Perhaps this is due to the lack of environmental law expertise in many developing countries. Although all four of the study countries have law schools and highly trained lawyers, there are only a handful of practising or governmental lawyers specializing in environmental and natural resources management. This particular handicap has a more far-reaching ramification. As more countries become aware of the increasingly important role of law in environmental management, new laws are being passed and old ones revised. The lack of indigenous environmental jurisprudence or legal expertise often means that such laws are based on examples, or models "borrowed" from the more developed countries. Usually, not enough modifications are made to take account of the social, cultural, political, economic and technological milieu in which these laws are to operate. An example is Malaysia's attempts to regulate air quality. Emission standards were borrowed from Singapore, Australia and the United Kingdom, and enforcement has encountered difficulties. The Air Quality Act Control Unit decided to follow the model adopted by Singapore because of the similarities (particularly geographical) between the two countries. However, because of Malaysia's peculiar (federal) problems the unit has discovered that state-level implementation of these regulations is very slow. The states consider these standards to be too stringent and have simply been uncooperative. Singapore's environmental legislation is considered to be among the most stringent in the developing world. If modifications had been made to make these

emission standards less stringent, the states would most likely be prepared to adhere to such standards.

The need for environmental laws which are relevant to a country's environmental problems, competent environmental lawyers, and effective administrative machinery is now being felt. Countries are collating existing laws in order to arrive at an orderly and comprehensive presentation of legislation. Many countries have had to engage in this exercise in order to provide the U.N. regional economic commissions (such as ESCAP and ECA) environmental protection programmes with such information. Law schools and universities are beginning to offer courses in environmental law. The curriculum at the University of Khartoum's Institute of Environmental Studies includes the principles of environmental law.[22] Government officials are beginning to realize the substantial legal aspect of their responsibility and are starting to utilize available resources both in-country[23] and external[24] to provide such assistance.

With regard to the problem of enforcement, many policy decisions have to be made. One involves the advisability of the incorporation of traditional resource management norms into enacted legislation. Scant information with regard to such norms exists, and there is a dearth of literature on the subject. The Ford Foundtion has been conducting some research on customary land and resource use laws and practices in the Sudan. Although a considerable amount of research has been conducted on customary laws in most of Africa, very little relates to natural resources. The topic of resource management norms may require considerable research in order to be incorporated into a country's legislative policy for environmental management. Nevertheless, it is an approach which is worth considering because of its potential for improved enforcement.

Often such laws have greater chance for success than "model legislation" as they are not an alien imposition on local inhabitants.

These are only initial steps in the right direction. A considerable amount of work remains to be done, particularly if one realizes that the effectiveness of laws depends on the proper functioning of the entire management system. Thus, concurrent improvements will have to be made in the other management objectives, if modifications in the legal and regulatory aspects are to be effective.

E. Manpower Resources, External Disincentives and Training

The lack of manpower resources is another major constraint on the environmental management capacity of many developing countries. The needs for indigenous environmental expertise vary, depending on the level of economic development. A World Wildlife Fund report on training needs in Latin America found that one major target group for environmental training was policy level decision-makers.[25] This need has been discussed in the section on increased awareness of environmental issues. However, in the poorer countries, the needs are for trained people in all sectors - natural scientists, foresters, agricultural scientists, engineers, etc. In both Ghana and the Sudan, many government institutions, particularly at the regional and local levels are understaffed and the implementation of programmes held up. Very few in-depth studies of the training needs of developing countries have been identified for this report.[26] The types of studies that have been done so far relate to the practice of the national and international development financing agencies.[27] Nevertheless, from the four study countries, an empirical statement can be made about types of needs. Generally

speaking, these are three-fold.

The first relates to the need identified in Latin America - sensitizing policy level officials to environmental issues. The second is for provision of on-the-job training for already qualified personnel in order to provide some professional development. The third relates to the creation of a new cadre of environmental professionals.

In the Sudan, the broad focus of the two-year course offered by the Institute of Environmental Studies and the varied background of its student body - both recent graduates of universities and officials from various ministries who have taken a leave of absence from their government responsibilities - is a good example of what can be done. All these activities point to the developing countries' realization of the need to build an indigenous capacity for environmental management.

Although many developing countries have benefitted from the technical assistance that has been provided by international organizations and development assistance agencies, the time has come for a critical evaluation of some of the unintended side-effects of such an approach. There is every reason to think that the continued use of foreign expertise may act as a disincentive to the creation of in-country expertise. Clearly the domestic policy of some developed countries could spur on this move to improve the technical manpower capabilities of the developing countries. The current U.S. approach to development assistance, as expressed at the recent economic meeting in Cancun, Mexico,[29] indicates an intention to help developing countries attain self-sufficiency by transferring the requisite skills, (technical, scientific, administrative and planning). This policy will obviously apply to the environmental management field as well.

It is hoped that this policy change will provide impetus to the initiatives that have already been started by aid agencies, multilateral development financing institutions and private foundations. Many attempts have been made to document efforts in the training field. For example, the Center for International Environment Information in new York and the Sierra Club have conducted a survey of environmental training programmes within the United Nations system, bilateral development financing agencies,[30] and private programs. These programmes include: formal environmental education both within the developing country (such as that supported by the Ford Foundation at the University of Khartoum) and in the developed country, such as the programmes offered at British Universities through the assistance of the Overseas Development Administration;[31] technical assistance programs, e.g. forestry, with a training component; and public education programmes, some of which are provided by NGO's, as noted in UNEP's report on the activities of NGO's. Also, efforts have been made to strengthen developing country regional training programmes. The US AID and Rockefeller Brothers Fund financial support for CATIE (the Tropical Agriculture Center for Research and Training) in Costa Rica[32] are cases in point.

These are but a few examples of training initiatives. Perhaps, one can say that many such programs exist and are available for developing countries to choose from. However, it is clear that a major gap remains to be filled. As mentioned earlier, needs for and methods of environmental training vary.[33] As yet, there have been very few detailed studies of the exact training needs of countries, or of geographical regions. Second, most of the training programmes outlined above have been in existence for a long enough time for an evaluation to be

done - evaluations which are overdue. Also, it is not clear how well publicized these activities are. The proliferation of such programs within the development assistance community emphasizes the need for a clearing house of information of available programs in this field. The completion of the first type of inquiry (developing country training needs) should facilitate the second type (developing country training programs). Once the country's or region's needs have been identified, it will be relatively easy to assess the value of in-country, overseas and regional training facilities and programmes as well as the value of short-term crash courses. This type of evaluation is a necessary component of efforts to improve activities in the training field. These exercises will go a long way toward convincing policy level decision-makers of the needs and the potential for meeting these needs, so that resources can be allocated for such programmes. The need to convince policy level people applies both in the developing countries and in the international development assistance sector as well.[34]

F. Traditional Resource Management Systems

There are many examples in the developing world of development projects or programmes which have failed to take account of developing countries' and their societies' values and indigenous strategies. The value of traditional systems in the health field has already been recognized and efforts are being channeled in that direction.[35] Perhaps in no other field is the need to adapt development strategies to accomodate these traditional systems as acutely felt as in the agriculture and resource management field. Particularly in situations where enforcement or lack of it is a serious obstacle, the beneficial impact of tradi-

tional systems becomes abundantly clear, and policies and programmes which do not represent a fundamental departure from well-entrenched norms are more likely to succeed. Some studies have been done on traditional systems, particularly in Africa.[36] A substantial portion of AID's rural development programmes are devoted to such studies.[37] However, they barely scrape the surface of the issue, in terms of the characteristics of systems and how they can be incorporated into overall development objectives. In only one of the study countries (the Sudan) were efforts made to co-opt the active participation of local people into the government's natural resources projects.

In many instances, this potential has gone untapped because in development objectives, modern methods of resource use have been presented as a viable, and in many cases a better, more cost-effective method. Hence, with very few exceptions (such as some farming communities in southern Africa which have resisted attempts to introduce new farming methods),[38] traditional practices have been discarded. In light of the magnitude of the task of environmental management, and the varied constraints and limitations on the developing countries' capacity to face that challenge, serious consideration of this potential opportunity would be worthwhile.

Conclusion

This wide-ranging survey of constraints on developing countries' environmental management capacity and their varied needs should not be interpreted as a blanket condemnation of their attempts at environmental management. There are impressive examples of programmes which have been successful and have had a very positive impact in the environmental

field. The foregoing discussion has merely pointed to weak spots in the overall structure. These constraints are not the only ones. External ones involving weaknesses in the programmes of international development assistance agencies themselves constitute a signficant, and at times overwhelming, constraint. One such weakness is the need for increased collaboration among donors so that the assistance they provide is channeled into areas where their impact is both environmentally positive and coheres into a signficant whole. A reassessment of developing countries' environmental management capacity along these two lines (identifying needs in the developing countries and areas where international development assistance agencies can strengthen their programmes) is a necessary first step towards identifying strategies for environmental management in developing countries.

FOOTNOTES - CHAPTER SIX

1. Antara Oil Palm Pollution Control. "Advances in Palm Oil Effluent Control Technology." Paper presented at DOE/IDRC Seminar, November 18, 1980.

2. See the FAO Land and Water Resources Survey for the Jebel Marra area, 1968.

3. Ministry of Overseas Development (United Kingdom), Land Resources Division. "The Land Capability Classification of Sabah." The set includes a compilation of maps and four volumes on the following regions: Tawau; West Coast.

4. IUCN-WWF-UNEP. "World Conservation Strategy." "Environmental Planning and Rational use Allocation," item 5.

5. Hassan, Pavez. "Status of Environmental Protection in the ESCAP Region." ESCAP, Bangkok, April 1978 at p. 10.

6. Lutz, R.L. "Laws of Environmental Management: A comparative study." American Journal of Comparative Law, 1976 at p. 458.

7. The CEQ serves as an advisory counsel to the President on environmental matters - S.201 of NEPA 1969.

8. Supra, note 4, World Conservation Strategy, item 11. "Improving the Capacity to Manage: Legislation and Organisation," at 11(b).

9. Ward, Barbara. "Progress for a Small Planet." W.W. Norton, 1979, Chapter 7.

10. Eckholm Erik. "Forests for the People," in Mazingira, No. 11, 1979, especially at p. 47.

11. See for example the World Bank's Forestry Sector Policy Paper, 1978.

12. Parameswaran, M.P. and Satish, S. "India: the debate on the economical impacts of two big projects - the Silent Valley Project." In Ecodevelopment News, No. 14 September 1980.

13. CAP. "Crisis in the Malaysian Environment" and "The Malaysian Environment in Crisis: Selection from Press Cuttings." Penang, Malaysia, 1978.

14. 95 members in March, 1981.

15. As of March 1981, over 70 such statements covering a wide range of environmental and energy issues since 1977 had been issued.

16. Reported in "Ecoforum," Vol. V, No. 4, Dec. 1980-Feb. 1981.

17. Chipko means to hug or to cling to -- describing the way in which concerned citizens hold on physically to trees to prevent them from being felled.

18. See Shepherd, Mark. "Chipko: North India's Tree Huggers." The Co-Evolution Quarterly, Fall, 1981, pp. 62-69.

19. Environment Liaison Centre. "Report on Non-Government Organization Activities on Environmental Issues Related to UNEP Programmes." Prepared for the Seventh Governing Council of the U.N. Environment Programme, Nairobi, 1979.

20. Environment Liaison Centre. "The Centre Report" (now "Ecoforum"). Vol. IV, No. 4, December 1979, "Role of NGO's in a Changing World," by Gary Gallon.

21. UNEP/International Association of Legal Science. "Manual on Environmental Legislation." February, 1979, especially at pp. 13 et seq.

22. Institute of Environmental Studies. Annual Report 1979-1980. University of Khartoum, Khartoum, 1980.

23. As was done in the case of Ghana, where the law school was requested by the EPC to compile a list of existing environment-related legislation.

24. The CITES (Convention on International Trade in Endangered Species) Secretariat has received requests from developing countries which need assistance with regard to the drafting of legislation to implement the Convention.

25. World Wildlife Fund (U.S.). "Strategies for Training in Natural Resources and the Environment: A Proposal for Development of Personnel and Institutions in Latin America and the Caribbean.

26. One is the WWF report. Another was prepared by SECID (Southeast Consortium for International Development), Clark University, and the University of North Carolina on environmental management and training.

27. E.g. the Center for International Environment Information. "Environmental Training in Developing Countries: a Study of the Practices of Major National and International Development Financing Agencies." September, 1980.

28. See supra, note 22, annual report of the IES. Some of the more detailed information on the IES programme was obtained during visits by the project team to the IES and in discussions with both students and professors.

29. For an explanation of the U.S. policy see the various White House Press Briefings presented and the meeting.

30. The Center for International Environment Information. "Environmental Training in Developing Courses: a Study of the Practices of Major National and International Development Financing Agencies." New York, September 1980. See also Sierra Club International Earthcare Center. "Directory of Selected U.S. Training Programs, Short Courses and Workshops in Environmental Protection and Natural Resource Management. A Survey of Programs for the Agency for International Development and the U.S. and the Biosphere Program." New York, 1979.

31. Ibid, at p. 12.

32. Ibid, at p. 7.

33. Dworkin, Daniel M. "Environment and Development. Collected Papers, Summary Reports and Recommendations SCOPE/UNEP Symposium on Environmental Sciences in Developing Countries," Nairobi, February 1974. Topic 9, Environmental Education and Training.

34. For an evaluation of AID's programs in one sector see Burton I. "Policy Directives for Rural Water Supply in Developing Countries." AID Program Evaluation Paper, No. 4 AID Bureau for Program and Policy Coordination, Office of Evaluation, 1979. One section contains recommendations to AID on education programs relating to water projects.

35. See for example Pillsbury, B.L. "Reaching the Rural Poor: Indigenous Health Practicioners are There Already." AID Bureau for Program and Policy Coordination, 1979.

36. See for example Horowitz, M. "The Sociology of Pastoralism and African Livestock Project." AID Bureau for Program and Policy Coordination 1979. Also U.S. Man and the Biosphere Program (MAB) Technical Notes No. 9. "Management of Natural Resources in Africa: Traditional Strategies and Modern Decision-Making."

37. E.g., Horowitz, Ibid.

38. Wilken, G.C. and Fowler, M.H. "Profiles of Basotho Farmers." Colorado State University Department of Economics 1979.

CHAPTER VII

APPROACHES TO ENVIRONMENTAL MANAGEMENT IN DIFFERENT DEVELOPING COUNTRIES

...The developing world is arbitrarily divided into poorer and middle income countries. Different environmental management strategies are proposed. The poorer countries appear to do better with a sectoral approach. But as countries become more affluent, a gradual shift in focus to the large projects and/or development schemes seems to be most effective...

This report so far has been devoted to environmental strategies adopted by developing countries. Necessary components which may need to be created, or strengthened, in order that such strategies may be evolved and implemented have been identified, and technical and information tools that may be necessary to this effort have been discussed.

The goal has been identified: environmentally sound social and economic development, perhaps best described as "integrated sustainable development." This chapter is devoted to a discussion of strategies for approaching this goal. Inevitably such approaches must vary in priority and emphasis within a country's (or a region's) economic, social and environmental situation. And indeed, such is the variety of countries' circumstances, that there may be almost as many policy mixes as there are countries. Nevertheless, it may be useful for analytic and even inductive purposes if a look is taken at the inhibiting factors in two groups of countries.

Here one must make some arbitrary division to indicate fundamental differences not only of financial resources and economic and social infrastructure, but also of available skills and knowledge which divide the poorer developing countries from those in what may be called the middle and upper-middle income categories. Such a separation may

be useful in analyzing the diversity of policy priorities needed to strengthen the integration of environmental considerations in a variety of countries.

A. Integrated Development for Sustainability in the Poorer Developing Countries

During the 1970s, the United Nations focussed upon the "least developed countries" for special attention. Most, but not all, of these poorer or less developed countries are found in two areas which the Brandt Commission[1] called the "poverty belts." One area extends across the middle of Africa from the Sahara in the north to Lake Malawi in the south. The other begins with the eastern tip of Arabia (the two Yemens) and stretches eastward across South Asia and some East Asian countries. These belts extend into other regions and parts of countries, such as Kenya, Burma, Cambodia, Vietnam and India.

There is a great variety of countries within these poverty belts. Most are totally impoverished financially (though not all, e.g. Gambia, with its new-found oil); some which are financially impoverished have considerable intellectual and informational resources (e.g. Bangladesh); some have large populations, others are small in area and/or population. Each country has a different approach to development and its economy has a different degree of openness. However, as the Brandt Commissioners have pointed out, all these countries have a slim margin between subsistence and famine and all are circumscribed by their ecology and their dependence upon international market forces beyond their control. The Brandt Commission Report described this connection as follows:

"they exist in a fragile tropical environment which has been upset by the growing pressure of people. Without irrigation and water management they are afflicted by droughts, floods, soil erosion and creeping deserts, which reduce the long term fertility of the land. Disasters such as drought intensify the malnutrition and ill health of their people and they are all infected by endemic diseases which undermine their vitality. Their poverty, harsh climate and isolation all make it harder to explore their resources, especially minerals. The sun, which might be a valuable source of cheap energy is presently a curse, sapping their vigour, while they are forced to use relatively expensive conventional forms of energy. They have cut down their forests degrading the environment in order to survive."

Conditions in these poverty belt countries worsened in the 1970s. Not only has their growth slowed down further, but even the increased assistance from the international community under such schemes as aid from "Sahel Club" contributors has been offset by the decline in the purchasing power of their exports. Moreover, many of these countries have to face the grim possibility that their eco-system may not enable them to feed their people - unless urgent measures are taken now.

For the purposes of discussing environmental management at least, the Brandt's (or the U.N.'s) definition of least privileged or poorest countries is not broad enough, and at the same time is too well-defined Ghana, for example, is in neither the U.N.'s nor the World Bank's categories of poorest or least privileged countries. Yet it cannot by any stretch of the imagination be compared with countries like Malaysia or Venezuela. Ghana has a high literacy rate, a slightly higher GDP than the Sudan, but its environmental problems are serious, and in terms of the exodus of the country's skilled manpower, its problems may be worse. Thus, it should be noted that at best such categories as 'poorest,' 'middle-income' etc. are broad approximations. More elusive considerations such as level of institutional development, skilled manpower availability or financial stability are also important.

Many, if not most of these countries, can be characterized by inadequate foreign exchange reserves, a lack of skilled manpower and, a modest, but growing, private sector. With regard to environmental policy, most countries in this group have no unified, unequivocal environmental and natural resources management policies or strategy, either separately described as such, or as part of their development strategy. Generally some environmental management concerns are incorporated into overall development planning only in relation to various sectors (e.g. agriculture, forestry, rural development, etc.). The Sudan's Six Year Plan (1977/78 - 1982/83), for example, places emphasis on the conservation of natural resources. Crop production, rural water supply and reforestation are also prominently featured in Upper Volta's five year development plan. Often, however, due to pressures for rapid implementation of certain politically prestigious projects, environmental dimensions (environmentally adverse impact of projects) are overlooked, or discarded as obstacles.

As far as governmental structure for integrated sustainable development is concerned, the countries in this group generally have a long road to institutional development ahead of them. Moreover, owing to a variety of reasons which include insufficient political commitment, unclear mandates, inadequate administrative organization, budgetary and human resources, the level of environmental management being achieved is generally minimal.

B. Proposed Steps to Improving Environmental Management in the Poorer Developing Countries - A Sector-Specific Approach

Improved environmental management can be brought about in the poorer countries by focussing the management effort on any one of three

levels - national, sectoral, or project. However, efforts directed on the national level are rarely feasible in the light of financial and manpower constraints under which the poorer developing countries operate. And the project approach, while attractive, has serious shortcomings: It presupposes an environmental strategy which identifies and confronts potential conflicts; it implies the existence of adequate legal frameworks; it implies the capacity to marshall public involvement; and above all, it implies that institutional capacity already exists. It may work for individual projects in sectors when objectives are clearly defined. But it runs the risk of achieving only marginal improvements of design and execution in a context of long-run disaster.

In the majority of the poorer countries, the sectoral approach to improved integration appears to remain the most practical. This involves a combination of two major thrusts:

- inclusion of environmental considerations in an overall policy policy framework;
- incorporation into sectoral arms of government of a strategy or plan for improving capacities for integrated sustainable development (institution building, adequate legislation, law enforcement, etc.).

The creation, or strengthening, of such an initiating or coordinating center does not remove the need for other forms or coordinating mechanism. Ad hoc inter-agency or inter-departmental committees will inevitably have an important contribution to make on particular issues. For example, in Ghana an inter-agency group, the Health Committee on Water Resources Development, meets periodically to discuss and recommend action to combat water pollution and water-bourne diseases associated with development.

Environmental Impact Assessment

Even the poorest developing countries could establish some criteria for EIAs (for example scale of projects requiring them, what they should include, what disciplines and interests should be represented). Legislation may help here, but administrative regulation is also required setting down procedures and terms of reference to establish who should conduct EIAs, how highly structured a procedure they should involve, responsibility for evaluating the reports and a number of other questions. Consideration should also be given to the question of whether separate legislation is necessary on the subject, or whether existing statutes (e.g. an industrial development law) can be amended to incorporate such needs.

Whatever method is adopted, its supervision or arrangements for EIAs and a number of the functions just referred to, should clearly be under the aegis of the environmental agency or institution which should have clear responsibility to ensure compliance with overall environmental standards.

The Problem of Environmental Training and Public Information

Chapter Six discussed a number of constraints, needs and opportunities for environmental training, expansion of public information and awareness of the inter-connected issues that add up to an environmental problem. It should be noted that environmental training on a sectoral basis need not help entrench "sectoralism" in thinking. Environmental training at the sectoral level is acceptable provided that the training breaks down barriers between sectors. For example, national education councils could establish a policy which instructs each discipline in the country's institutions of higher education to dedicate a minimum of time to looking positively at the methods, the

subject matter and the value of other disciplines. Training should concentrate upon the techniques of integrated management. And, environmental training should extend to decision-makers. Brief seminars, or short courses could be provided which would demonstrate how a development project, or integrated regional scheme, can be made or broken depending upon environmental considerations.

Finally, the institutional challenge includes arrangements to bring these issues to the attention of the mass of people whose personal attitudes and choices are the decisive factor in any national effort to protect or improve the environment.

Thus, this approach seeks to marshall environmental knowledge, expertise and law around sectoral management. It does not imply an independent evolution and implementation of sectoral environmental objectives without reference to the interests of other sectors, or overall planning for sustainable developemnt. For example, in the agricultural sector, the approach would involve integrating such elements as scientific and technical information, environmental expertise, laws relating to sound land use practices, pesticide use regulations, etc. with the total economic development objectives of the sector. Meanwhile, parallel activities taking place in other sectors, e.g. forestry, public health, energy, will be cross-related to this integration process. There is a crucial central function of selecting points where improvements may be vital to the success of sectoral objectives and the overall integrated development plan. The following four sections describe some of the component functions that this approach requires for effective implementation.

1. Policy

The first step that should be considered - or if already taken, reviewed - is the formulation and adoption of an overall national environmental and natural resources management policy. As stated earlier, this could equally well be called a policy for integrated development. In fact, as suggested earlier, the latter may be a better title because it may help avoid confusion over "automatic" conflicts between concepts of conservation, environment and development.

This overall policy need not be detailed and specific. What is required is a flexible policy framework which points to and legitimizes modifications of structure and objectives to be made in relevant sectors. The aim of this approach is to provide an opportunity to reconsider the role of environmental conservation and the general misconception that it must inevitably detract from economic growth objectives. It should place the subject in perspective and help to produce a desired shift in attitude. Further, it should emphasize the country's unequivocal commitment to these issues, and provide the basis for programmes, activities, legislation etc. that are required for environmental management.

A number of examples of this sort of terse statement can be cited from around the globe. India's statement is interesting in that it is embodied in the Constitution. Article 48(A) of India's Constitution proclaims that the State "shall endeavor to protect and improve the environment and safeguard forests and wildlife of the country." Such a brief policy statement is useful if it is combined with affirmations of such commitments by decision-makers. In India's case, its new economic plan has a chapter on conservation for the first time.[2] The

concept of sustainability should be incorporated into national economic plans, both in the objective and - so far as possible - in the emphasis of each chapter. The value of a separate chapter on conservation - as in India's case - may be great in legitimizing the issue in the context of development, as well as dealing specifically with matters such as territorial management, legislation, administration and training.

2. Institutional Strengthening - Stock-taking

a) Stock-taking

An important first step towards meeting the institutional challenge is a stock-taking exercise designed to discover which of these needs are being met, and how effectively, by existing institutions. A further advantage of stock-taking of this kind is that it will help to iron out jurisdictional conflicts and overlaps as well as identify gaps in institutional coverage which require correction. This survey of institutions from an environmental viewpoint may be valuable in the richer developing countries as well (see next section).

b) Building up an Environmental Initiating/Coordinating Center and Inter-Departmental Arrangements

Serious consideration ought next to be given to the creation, or strengthening (where one exists), of an institutional body which will be empowered with overall coordination of activities in this field. The existence of such an institution is vital to rational management. Although its primary functions will be national policy making, coordination and monitoring of acitivities, it could also have regulatory functions to endow it with the authority that is required to prescribe standards.

How big should such an institution be? Grandiose notions regarding a body to perform the above functions in the poorest countries are quite inappropriate. In fact, a very small organization can contribute towards integrated environmental management if it is properly placed and has the right mandate. The system adopted in Indonesia is a noteworthy example.

Ghana and the Sudan are examples of countries with small focal points for environmental responsibility which can lack status and executive power. The Indonesian example is worth examining by countries considering the creation or reorganization of an institutional focal point for environmental activities.

3. Environmental Legislation

Proposals made by government agencies for legislation should be negotiated with the central environmental institution. While legislative policy making on the environment cannot and should not be confined to one agency, there ought to be general criteria to provide guidance to the various agencies which are involved in the implementation of environmental policies to ensure compliance with the overall policy. It is not possible to state here in any detail what these criteria should be. However, in light of serious deficiencies encountered in this review the following recommendations are offered:

First, laws should strive for enforceability above stringency. In other words, they should impose realistic obligations and obtainable objectives. This applies to economic and technical feasibility (for example controlling or monitoring equipment) as well as manpower resources.

Second, laws should equip enforcement gencies with the legislative power and administrative capacity to regulate and, where necessary, modify existing standards. In many cases actions which could have been controlled by administrative regulations have been delayed by tedious, protracted procedures to promulgate laws because the relevant agencies did not have regulatory powers under a given statute. The kind of regulatory flexibility which is fostered by this approach is also conducive to the creation of appropriate standards in different circumstances. Agencies may be able to issue different emission standards for, say, different waste treatment processes, depending on the qualities of the receiving water courses.

Lastly, comparisons should be made with legislation in other fields in order to draw from experience. Most countries generally find it necessary to review, or relax their investment laws in order to attract foreign capital and investment.[3] This is a procedure which may occur quite widely in the environmental field if very stringent environmental regulations are adopted. In addition, countries should draw on existing experience with methods adopted elsewhere for tax incentives in investment laws; for example, use in timber and logging concession legislation, waste water treatment in factories, irrigation projects, etc., to encourage the adoption of environmentally benign remedial or preventative programmes.

Conclusion

The major advantage of a gradual approach in the poorest or "poverty belt" countries is that it focuses limited resources - from aid suppliers, development financing agencies and from recipient coun try - on the "high impact areas," where there are vested interests

in achieving better environmental management. The evolution of haphazard, fragmented management regimes may be avoided if the focus of improvement is on sectoral activities within some variation of the policy framework described above. Another advantage of this approach is that, to a large extent, it corresponds to the strategic planning of both developing countries and development agencies, where annual, or longer-term, targets are established on the basis of sectoral objectives. Hence, these environmental management objectives will represent an extra dimension to be considered in planning, rather than a new sector which requires a completely new deployment of resources. In fact the Brandt Commission put particular stress on this critical nexus of desperate poverty and eroding natural resources. For the poorest countries the report proposed a "program of structural and ecological change" embracing water and soil management; health; afforestation and energy; transport and communications; and mineral exploration. For these countries, the Brandt Commission stressed the importance of regional cooperation, in particular major international financial support for the development of four large ecosystem regions: the Sahel, the Kagena River Basin, the Brahmaputra-Ganges programme and the Mekong Committee's project. The Commission estimated that the funds required to meed these regional projects (1978 prices) as a minimum of $4 billion per annum <u>additional to present aid</u> for the two decades 1980-2000. Moreover, it stressed that "most of this finance should be provided on grant or near-grant terms and must be assured for long periods of time."[4]

C. Environmental Management Concerns in the Middle-Income Developing Countries

In the better off or middle-income developing countries, the situation is often more complicated. In many cases, long established institutions are beginning to show more acceptance of environmental concerns. And in existence are environmental institutions with a range of authorities and responsibilities and government revenue, which, while in no way bountiful, is sufficient to finance activities in this area. At the same time, anything approaching an integrated management system has in almost all cases yet to become a reality. In short, a progression has been made from a point where development officials primarily concerned with economic growth would scarcely render lip service to environmental concern, towards a point where that concern has been institutionalized, often in a quite impressive manner.

This degree of progress may, however, have concealed an initial misperception of what could be achieved by the new environmental agency or coordinated body. Indeed, often there has followed a rising sense of dismay that even with the new institutions, environmental management as part of the country's development strategy is not functioning smoothly. In fact, there is widespread evidence of a heightened sense of conflict between environmental concerns and the development process. Add to this the willingness, noted earlier, of bureaucrats to seek to enlarge the vested interests of their own institutions, and one can readily see why the reaction of traditional governmental interests at the end of the first "environmental decade" is by no means wholly positive towards measures aimed at environmental management. Some of the basic characteristics of middle-income developing countries follow:

Financial constraints are likely to be considerable, but not such as to prevent any investment in improved environmental administration if this investment can be demonstrated to have a likely short/medium term payoff. In these countries the problem is less one of inadequate financial resources than of priorities in the allocation of these resources.

These countries do not suffer from such a severe dearth in trained human resources as the poorer countries. Since economic opportunity exists for individuals, the flight of human resources, or "brain drain," is much less of a problem. However, it is often the case that, while the standard intellectual resources exist in sufficient numbers, there is a shortage of specially qualified expertise, e.g. in ecology, fresh water biology, land management, social forestry, etc. Moreover, environmental lawyers are still in short supply.

The better-off developing countries have more clearly defined policies regarding environmental matters. First of all, they often face a sizable and rapidly growing pollution problem which preoccupies especially the higher income group of the population whose local concerns keep environment firmly on the national agenda. Also, with their greater resources, the better-off developing countries have gone further to develop systematic means to deal with environmental aspects of development problems.

Most of these countries have functioning environmental institutions which, while often not particularly effective, are highly visible in a political sense. Such new institutions generally have links to cabinet-level decision-making.

The institutional structure for environmental management for Venezuela and Malaysia are both fairly typical of the prominence of the new environmental institutions of the 1970s in these functions. However,

in the case of many middle-income developing countries, while the new institutions may have high visibility and even putative authority, in many cases they are low down in the bureaucratic order of importance and power, and often under attack from a number of critical and well-informed non-governmental organizations (environmental protection societies, universities, global conservation organizations, etc.).

Whatever the nature of this environmental institution, there is now growing confusion over their powers and the role they play. Given the pragmatic problems faced by any new organization in carrying out an unclear mandate among such traditional power centers as the ministry of finance, economic planning, presidential economic development unit, etc., built-in bureaucratic conflicts are certain to emerge. This tension can lead to considerable stress and even change of function when the conflict becomes focused upon a cause celebre. (The Batu Caves issue in Malaysia is a good example of a contretemps which has involved public and private sectors and which has attracted national concern).[5] During those periods, the new environmental institution may find itself caught in the crossfire of the power structure on the one hand and an increasingly vocal citizenry on the other.

Most countries in this category have to some extent established control over the activities of the private sector, especially external investors, through requirements for environmental behavior associated with the granting of licenses, etc. This often involves regular inspection of products to determine if they comply with established standards, monitoring of treatment of waste products, etc. On the other hand, problems arising from activities being carried out in the public sector are often more difficult to resolve. In Malaysia, as already noted,

the Federal Land Development Agency, a governmental activity, is a repeated violator of the standards set for the treatment of palm oil effluent. Whether or not the new environmental institution has authority over the important development schemes which are tailored to national priorities or indeed any input into the project planning process, varies from one richer developing country to another. In Venezuela, for example, many public works projects arise within the Ministry of the Environment and Renewable Natural Resources. In Malaysia, the Department of the Environment is responsible only for pollution control.

D. Environmental Management Priorities for the Middle-Income Developing Countries: Development Schemes as a Basis for an Integrated Approach to Sustainable Development

How usable are the proposals of the World Conservation Strategy (see figure 1) likely to be to a middle-income developing country?

The authors of the WCS believe that ecosystem evaluations (EEs) should be prepared as a matter of priority and be used "to influence all policies from the earliest possible date." The EEs should, it is claimed, be based upon available knowledge and not be deferred because of lack of information. The authors of the WDS also acknowledge that the "degree of detail and area coverage possible will vary greatly from country to country." And they stress "it is possible to achieve coverage at the expense of detail rather than the other way round." The filling and modification of the picture can, it is claimed, follow with greater knowledge.

As regards procedures to achieve integrated sustainable development, the WCS recommends that uses of land and water be allocated

Figure 1

The Relationship between the Allocation of Land and Water uses and Assessment, Research and Monitoring

From World Conservation Strategy, Section 10

Use Allocation	Assessment, Research and Monitoring
Ecosystem evaluation (EE)	Environmental assessment may be necessary with respect to certain ecosystems/uses. Identify gaps in knowledge.
1. Make broad inventory of ecosystems evaluating qualitatively their characteristics.	
2. Tentatively allocate uses according to these characteristics (that is, each ecosystem's intrinsic capacity to supply particular goods/services). Make public.	
Demand Allocation	
3. Tentatively allocate uses according to current and projected demand (uses of and impacts on ecosystems). Make public	Environmental assessment normally essential. Identify gaps in knowledge.
Comparisons of allocations and decisions on use	
4. Compare allocations and identify compatibilities and conflicts. Make public.	
5. Arrange for multiple-use management of relevant ecosystems to take advantage of compatibilities.	Environmental assment mandatory. Rank gaps in knowledge for research priorities and design and launch research programme.
6. Reconcile conflicts by zoning and scheduling; where this is not possible decide use on the basis of environmental assessments, public comment and political judgement.	
Continue to improve EE, modifying use allocation as required.	Monitor results.

on the basis of each ecosystem's capacity to supply particular goods and services (the EE, elaborated by specific environmental assessments is supposed to achieve this first step). Next, uses should be allocated a second time on the basis of current and projected patterns of demand on each ecosystem, as reflected by current use.

Finally, and quite logically, the results of allocation by supply characteristics (the EE) and of allocation by demand characteristics should be compared to reveal conflicts and compatibilities between the two. Conflicts should be reconciled where possible by zoning and scheduling. "Where this is not possible," the strategy concludes, "resolution will be a matter of political judgment."

To what extent are such procedures usable today in developing countries? First of all they imply an installed environmental management structure such as rarely exists in the poorer developing countries (which is why they are discussed here in the context of the 'better-off,' or middle-income developing countries). Secondly, it seems that there will be very few such countries which will be in a position to mount such programmes of ecosystem evaluation at an early date on a country-wide basis. What does seem to be an early possibility, however, is that a number of countries may wish to employ the principles of the strategy in regard to a development scheme or schemes in the context of one or more ecosystems, i.e. on a eco-region basis.

Given a reasonably clear definition of national policy with regard to environmental concerns, as well as a growing capacity for integrated planning and execution of projects and development schemes, what strategy should those with environmental responsibility adopt in their quest for improved performance?

1. Improved Project and Regional Analysis

If by now, environmental impact assessment procedures have not been integrated (when appropriate) into the project design and review process of middle income developing countries, such a development is long overdue. The goal of the environmental management structure should be to bring about this integration in an orderly fashion, with as little friction as possible and in a manner which makes the environmental/natural resources review simply another part of the pre-feasibility study and/or project proposal process. Where possible, and especially for large or high-impact schemes, countries should experiment with setting their impact assessment procedures in the context or the approach proposed in the WCS, and outlined above. Naturally to the greatest extent possible this work should always be conducted by people from national institutions in the developing country concerned. In certain cases, however, to avoid making undue claims on government resources, the technical staff of the external financing agency investing in the project, or their consultants, should be used to help organize these environmental/natural resource reviews. However, if such resources are employed, the work should be carefully monitored by staff from national institutions as, wherever possible, counterparts should be trained in the process.

2. Increased Budgets and Career Staff

Expanded responsibilities can only be undertaken if the better-off developing countries are willing to commit additional financial and human resources to this field. Thus, the corollary to better environmental management will in most cases mean a monetary increase in the resources

from the central government's budget to all activities in the environmental area. As was recommended above with regard to environmental impact assessments for major schemes, an excellent investment on the part of the central government would be to make a rough and ready analysis of the potential savings in terms of natural resources that might be expected to accrue from improved environmental management.

As environmental institutions gain in experience, there will be personnel concerns to deal with as well. Issues that are already becoming important are:

- the sort of career ladder that should be developed so that talented personnel will have an incentive to remain;
- the design of training programmes that should be built into the personnel system so that the country's officialdom may keep in touch with a rapidly changing state-of-the-art;
- what investment to make in finishing the collection of baseline data;
- what to spend on establishing, or completing, a network of monitoring stations.

3. Strengthening Indigenous Environmental Expertise

With regard to human resources, these middle-income countries could, whenever possible, stimulate interest in the environmental sector by providing economic incentives so that bright, creative minds are attracted into this field. Thus, where possible, contracts should be awarded to domestic firms or university groups when adequate, if budding talent exists. Joint ventures between expatriate and indigenous firms also should be encouraged. By so doing, monetary incentives will

be provided, local skills can be upgraded until the domestic firms can stand upon their own, and the entire process of technology transfer stimulated.

4. Increasing Public Awareness

As was discussed in the previous chapter, a final vital element of the environmental management strategy in a middle-income developing country is the education of the national citizenry in the environmental programme associated with development. Public clean-up campaigns such as were carried out in Singapore, poster and bumper sticker messages, increased public education through the school system, enlisting the support of religious groups where appropriate, the stimulation of such grass roots organizations as nature study groups, the introduction of university level courses and degrees in the environmental sciences, etc. should be encouraged.

Conclusion

The activities described above are but some of the ways in which the better-off developing countries can strengthen their capacity for environmental management as an integral part of their national development. All of them are very largely a matter for national initiative. However, it is clear that the international community can also play a vital part in helping and encouraging such steps as are designed to lead to more soundly based and more sustainable development.

FOOTNOTES - CHAPTER SEVEN

1. See Chapter 4 - The Poorest Countries.

2. Agarwal, Anil. "India Looks to its environment." New Scientist, February 5 1981, p. 362.

3. For example, Ghana recently revised its investment code in order to attract investors. See Ghana News, Vol. 10, No. 10, October 1981. Also, Investment Code, 1981, Act 437.

4. Supra, note 1, esp. pp. 86-88.

5. See various press cuttings from CAP "The Malaysian Environment" op cit.

Appendix I FURTHER READING

Introduction

I. General Bibliography

1. Adeniji, K.
Legal Challenge of Environmental Pollutants to Africa: a Case Study on the Regional Approach to Environmental Problems.
4, Anglo-American Law Review 1975, p. 312.

2. Alcantara, Pedro
A strategy for environmental protection in Mozambique.
Instituto de Investigacao Cientifica de Mocambique, Maputo, Mocambique, 1980.

3. Beller, William S., ed.
Proceedings of the Conference on Environmental Management and Economic Growth in the Smaller Caribbean Islands, Wildey, St. Michael, Barbados, September 17-21, 1979.
U.S. Department of State, November 1979.

4. Republic of Botswana, Department of Mines
Air Pollution Control. Annual Report, 1979
Gabarone, March 1980.

A detailed report on the state of air pollution control in Botswana, including air quality data for Gabarone.

5. Caribbean Conservation Association
Caribbean Conservation News, 1980.
Published by the Caribbean Conservation Association, Barbados.

Contains up-to-date information on environmental activities in the Caribbean, reports on meetings and workshops in the region, information on forthcoming conferences and meetings and a list of recent publications.

6. FAO
The Gulf of Guinea: Pollution, the Need for Control and Possible Mechanisms Thereof.
Rome, 1978.

Prepared under a joint FAO/UNEP project on preparatory work for the meeting of governmental experts to develop an action program for the marine environment of the Gulf of Guinea. It contains a review of the state of marine pollution in 20 coastal states.

7. _____, Legislation Branch
Background Papers Nos.:
7, 1975 - Outline for the preparation of a national water resources law inventory.
By Dante A. Caponera.

10, 1976 - Legal and Institutional Aspects of Water Resources Development in Africa. Prepared for the ECA Regional Preparatory Meeting for the United Nations Water Conference.
By Dante A. Caponera.

8. _____, Legislation Branch, Legal Office
Legislative Studies Nos:
4 - Legal Systems for Environment Protection. Japan, Sweden, United States. P.H. Sand, 1972.
5 - Agrarian Law and Judicial Systems. J. Masrevery, 1975.
10 - Water Law in Selected European Countries. Legislation Branch, Legal Office, 1975
13 - Derecho agrario y agricola. Estado actual y perspectivas en America Latina. 1976.
14 - Legal and Institutional Responses to Growing Water Demand. Ludwik Teclaff, 1977.

9. Freeman, Peter H.; Cross, Bradley; Flannery, Robert D; Harcharik, David A; Hartshorn, Gary S; Simmonds, Greg and Williams, James D.
Bolivia: State of the Environment and Natural Resources.
July 1, 1980.

This is an environmental profile based on a field study. It contains detailed recommendations both to the Bolivian authorities and to AID.

10. Freeman, Peter H.
Environmental Aspects of Development in the Paracatu River Basin, Brazil. Report submitted to the Department of Regional Development, OAS, December 1978.

An examination of the environmental and natural resource issues in the Paracatu River Basin and the national and state level laws dealing with some of these issues. Study concludes with a list of recommendations for surveys and research, urging the involvement of Brazilian institutions in the implementation of these activities.

11. Geping, Qu
Controlling Pollution in China (Reprinted from "China Reconstructs", a magazine published by the People's Republic of China.)
EPA Journal, undated.

12. Goodland, Robert
Environmental Ranking of Amazonian Development Projects in Brazil.
Environmental Conservation, Volume 7, No. 1, Spring 1980.

An evaluation of the effects of industrial, mining, energy, forestry, agricultural and transportation projects on the Brazilian Amazonia. Includes extensive references.

13. Hellman, Richard
Development of Environmental Law in Israel. Final Report of UNEP Project FP/0302-77-01 Environmental Legislation, Regulations and Procedures.
Prepared for the Israeli Environmental Protection Service, Ministry of the Interior, and UNEP.

Study of existing Israeli environmental legislation and drafts of proposed legislation that would strengthen Israel's environmental policy.

14. Horberry, John; and Johnson, Brian
Environmental Performance of Consulting Organizations in Development Aid.
IIED, Washington and London, 1981.

This study focusses on the performance of the consulting organizations which undertake environmental planning and assessment of development projects.

15. IUCN
Conservation for Thailand - Policy Guidelines.
IUCN, Morges, Switzerland, March 1979.

Report prepared in collaboration with UNEP for the National Environment Board of Thailand. The report is organized in two volumes: Volume I - Policy Guidelines and Volume II comprised of the appendices which contain the background information on which the guidelines are based.

16. Ogundere, J.D.
The Development of International Environmental Law and Policy in Africa.
Natural Resources Journal, Vol. 12 (2), 1972.

17. Lance E; Willsie R; Moore M; Hagood M, and Kemper, D.
Proposed Water Management Program for Major Irrigation Schemes in Sri Lanka.
AID, 1979.

Notes poor irrigation management, lack of commitment of funds for maintenance in Sri Lanka which impair efficacy of water in management programs. Evaluates: institutional, organizational, and physical components.

19. Republic of the Philippines

Philippine Environment 1978. Concerns and Issues: A Digest. National Environmental Protection Council, Department of Natural Resources, 1978.

Topically describes the major environmental problems of the Philippines and the current efforts being made to alleviate them.

20. _____

Primer on Environmental Protection.
National Environment Protection Council, Department of Natural Resources.

A brief look at what the Government of the Philippines is doing to combat specific environmental problems.

21. Queslin, Ata H.; Lawrence S. Hamilton, Dieter Mueller-Dombois; W.R.H. Perera and Richard A. Carpenter

Assessing Tropical Forest Lands: Their Suitability for Sustainable Uses. A Report of the Conference on Forest Land Assessment and Management for Sustainable Uses, June 19-28, 1979, Honolulu, Hawaii.
East-West Center, Honolulu, January 1980.

One activity of larger project, "Natural Systems Assessment for Development." Focusses on providing a practical approach to capability classification and suitability assessment of tropical forest lands in order to assist land-use planners in avoiding misuse of land and in allocating land to uses sustainable with available technology and management.

22. Robinson, Nicholas A.

Chinese Initiatives for Environmental Protection in 1980.
Pace University School of Law, August 1980.

Descriptive look at environmental protection initiatives taken by China since the end of the Cultural Revolution. Describes the work of UNICEF and specific initiatives taken by several Chinese cities.

23. Rondinelli, D.A.

Applied Policy Analysis for Integrated Regional Development Planning in the Philippines.
Third World Planning Review, Vol. 1, No. 2, pp. 50-178.

Evaluates network of integrated spatial (urban-rural relationships) analysis used in the AID's BICOL River Basin project in the Philippines in order to develop the framework for such development planning.

24. Shah, S.M.
Urban Land Use Control in Asia and the Far East: Legal and Administrative Framework.
Earth Law Journal, Vol. 2, 1976, p. 111.

25. Skillings, Robert F., and Tcheyan, Nils O.
Economic Development Prospects of the Amazon Region of Brazil.
Johns Hopkins School of Advanced International Studies, November 16, 1979.

Chapter IV concerns environmental issues in the Amazon.

26. Soemarwoto, Otto
Interrelations Among Population, Resources, Environment and Development in the ESCAP Region, with Special Reference to Indonesia.
Bandung, Indonesia.

Analyzes some of the ecological aspects of development in Indonesia and suggest ways to improve the results of development, emphasizing an ecosystem approach.

27. Teclaff, L.
Harmonizing Water Use and Development with Environmental Protection
16. Natural Resources Journal 1976, p. 807.

28. United Nations Economic Commission for Africa (ECA)
Report of the African Regional Meeting on Problems and Needs of Africa in Community Water Supply and Sanitation.
Addis Ababa, 4th-8th August 1980.

29. United Nations Environment Programme/CEPAL
UNEP Document Nos. UNEP/CEPAL/WG.48 et seq.
September 1980.

Documents prepared for second intergovernmental meeting of nominated experts to review the Draft Action Plan for the Wider Caribbean Region.

30. _____
UNEP Documents Nos. UNEP/WG.41/INF. 1-41.
1980.

Series of documents, articles, research papers, etc. prepared for UNEP's Action Plan for the East Asian Seas.

31. _____
UNEP Documents Nos. UNEP/WG. 27
1979.

Series of documents, articles and research materials, etc. on UNEP's Draft Action Plan for the protection and development of the marine environment and coastal areas of the West Africa region.

32. _____, Economic Commission for Latin America (CEPAL)
UNEP Document Nos. E/CEPAL/PROY.3/L.INF.1 et seq.
Caracas, Venezuela, 1979.

Series of documents, articles and research papers prepared for UNEP's Action Plan for the Caribbean Environment Programme.

33. _____/ The Arab League Education, Cultural and Scientific Organization (ALESCO)
A Program for Environmental Studies, Red Sea and Gulf of Aden, Jeddah II Conference, 12th-18th January 1976.

34. _____

Report of the IOC/FAO/UNEP International Workshop on Marine Pollution in the Caribbean and Adjacent Regions Workshop Report No. 11.
Port of Spain, Trinidad, 13-17th December 1976.

The workshop covered such topics as pollution research and monitoring, health aspects of coastal water pollution, political aspects of marine pollution, research needs as well as training and technical assistance needs, data handling procedures, etc.

35. U.S. Agency for International Development (AID, Department of State)
AID Research and Development Abstracts.

Bibliographic information on agriculture, environmental and natural resources.
Volume 9, No. 2, July 1981.

36. U.S. Environmental Protection Agency, Office of International Activities
Environmental Profiles of Belgium, Canada, France, Great Britain, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland.
1976-77.

37. WHO
Prevention and Control of Water Pollution: Report on a Government of India/WHO Seminar on the Implementation and Administration of the Water (Prevention and Control of Pollution) Act, 1976 (India), Bombay, 17th-21st January, 1977.
New Delhi, May 1977.

38. Weerasinghe, O.
Adapting Laws and Administration to Improving the Human Environment.
Earth Law Journal, Volume 2, 1976, p. 121.

II. Ghana

39. Asibey, Emmanuel O.A.
The Blackfly Dilemma.
Environmental Conservation, Vol. 4, No. 4, Winter 1977.

Blackfly and the Environment.
Environmental Conservation, Vol. 2, No. 1, Spring 1975, pp. 25-28.

Expected Effects of Land-use Patterns on Future Supplies of Bushmeat in Africa South of the Sahara.
Environmental Conservation, Vol. 4, No. 1, Spring 1977.

Wildlife as and Economic Resource under West and Central African Situation.
Report of Technical Meeting on the Conservation of Biotic Communities in Central and West Africa, Ouagadougou, Upper Volta, 4-10 February 1980.

Wildlife as a Source of Protein in Africa South of the Sahara.
Biological Conservation, Vol. 6, No. 1, January 1974, pp. 32-39.

40. Benneh, G.
Water requirements and limitations imposed on agricultural development in Northern Ghana.
Factors of Agricultural Growth in West Africa, 1971, pp. 71-81.

41. Dadson, J.A.
Farm size and the modernization of agriculture in Ghana.
Factors of Agricultural Growth in West Africa, 1973, pp. 193-202.

42. Government of Ghana
Environmental Protection Council of Ghana (EPC)
a. Annual Report for the year ending 30 June 1974
Accra: Ghana Publishing Corporation, 1974.
b. Register of Toxic Chemicals. Part One: Pesticides
Accra, 1978.

Health Committee on Water Resources Development
Report of Workshop on Mode of Working of the Health Committee on Water Resources Development
Accra, 1980.

Ministry of Agriculture
Action Programme for Agricultural Production 1980-81.
Accra, 1980.

Ministry of Finance and Economic Planning
The Annual Estimates for 1979-80
Part I, Vol. III: Lands, Natural Resources, Fuel and Power
Part I, Vol. IX: Health
Accra, July 1979.

Ministry of Lands, Natural Resources, Fuel and Power, Forestry Department
Annual Report of the Forestry Department for the Calendar Year 1975.
Accra, 1975.

Ghana Geological Survey Department
Ghana Geological Survey (Report No. 75/6) by G.O. Kesse
Accra: Ghana Publishing Corporation, September 1975.

Wildlife Conservation Policy of the Republic of Ghana
Accra, January 1979.

43. Obeng, Letitia
Some Environmental Issues in Water for Development
Water Supply and Management, Vol. 4, No. 3, 1980, pp. 115-28.

Water in the Environment: the UNEP Experience
Water Supply and Management, Vol. 4, No. 3, 1980, pp. 155-70.

44. Ofori, I.M.
Land Tenure Interactions and Land Use Patterns in Ghanaian Agriculture: Some Basic Theoretical Considerations.
Factors of Agricultural Growth in West Africa, 1973, pp. 91-100.

45. University of Arizona, Arid Lands Information Center
Environmental Report on Ghana.
Tuscon: University of Arizona, 1980.

III. Malaysia

46. Ahyat bin Mohd, Nor, Mohd
Air Pollution and Control in Malaysia.
Kuala Lumpur, February 1971.

47. Aiken, Robert S. and Moss, Michael R.
Man's Impact on the Natural Environment of Peninsular Malaysia: Some Problems and Human Consequences.
Environmental Conservation, Vol. 3, No. 4, Winter 1976.

48. Aug, Stephen M.
Malaysian Development Plan Hits Snags.
The Washington Star, December 4, 1980.

49. Burgess, P.F.
Silviculture in the Hill Forests of the Malay Peninsula.
The Forestry Department of Peninsular Malaysia, Kuala Lumpur 1975.

50. Chander, R., Chief Statistician, etc.
Housing Needs in Peninsular Malaysia (1970-1990), translation.

51. Conway, Gordon R.
A consequence of insecticides. Pests follow the chemicals in the cacao of Malaysia.
Living Earth, October 1970, vol. 14, pp. 93-94

52. Conway, Gordon and Romm, Jeff
Ecology and Resource Development in Southeast Asia.
A report to the Ford Foundation, New York, August 1973.

53. The Economist
Malaysia: A Survey
December 22, 1979.

54. Environmental Protection Society of Malaysia (EPSM)
"Alam Sekitar' monthly magazine published by the EPSM

55. Government of Malaysia
Mid-Term Review of the Third Malaysia Plan, 1976-80.
Semenanjung Malaysia, Kuala Lumpur 1979.

56. Hamzah bin Abdul Majid; Furtado, Jose and Skrine, J.S.
Prevention of pollution: some thoughts on environmental measures.
Paper presented at the Third Malaysian Law Conference, Kuala Lumpur, October 13-15, 1975 (unpublished).

57. Hasmah Harun and Abu Bakr Jafaar
Analysis of Water Pollution Control Complaints in Peninsular Malaysia, 1979.
Division of Environment, Kuala Lumpur, May 1980.

58. Horri, Kenzo
The Land Tenure System of Malay Paid Farmers - A Case Study of Kampon Sungei Bujor in the State of Kedah.
The Developing Economies, Vol. X, No. 1, March 1972.

59. Kamarudin, Ran
Land administration in Peninsular Malaysia, a study on some critical areas.
Kuala Lumpur, 1973.

60. Law, A.T.
Sewage pollution in the Kelang River and its estuary.
Pertania, Volume 3, No. 1, July 1980.

61. Leigh, C.H.
Land development and soil erosion in West Malaysia.
Area, Vol. 5, No. 3, 1973.

62. Marshall, Adrian G.
Conservation in West Malaysia: the potential for international cooperation in biological conservation.
Vol. 5, No. 2, April 1973.

63. Mauzy, Diane K.
Two rural development strategies: organization, administration and performance and political priorities in India and Malaysia.
January-April 1975, Philippine Journal of Public Administration, Vol. XIX, No. 1 & 2.

64. Menon, I.P.V. (Librarian, Forest Research Institute)
History and development of forestry and forest industries in Malaysia, a bibliography.
Kepong, Selangor, 1976.

65. Monroe, Michael
England Linda, elephants and agriculture in Malaysia.
Department of Wildlife and National Parks, Kuala Lumpur 1978.

66. Myers, Norman
Conversion of tropical moist forests.
National Academy of Sciences, Washington, DC 1980.

67. Na'imah Abdul Khalid
Batu Caves: an Obituary?
Paper presented at University of Malaya Law School Seminar on Law and the Consumer, unpublished report.

68. Ness, Gayl D.
Bureaucracy and Rural Development in Malaysia.
University of California Press, Berkeley and Los Angeles, 1967.

69. Sardar, Ziauddin
The Fight to Save Malaysia.
New Scientist Magazine, September 4, 1980, Vol. 87, No. 1217.

70. Sekarajasekaran, A.
Water quality management within existing legislation in West Malaysia.
Paper presented at seminar on the role of engineers in environmental pollution control, Kuala Lumpur, March 1972.

71. Suhaimi, Ariffin
Water quality management in Malaysia.
Asia Aquatech 1980 Exhibition, Water Quality Management Conference, Singapore, March 5-7, 1980.

72. Syed, Hussain Wafa
Land development strategies in Malaysia - an empirical study.
Malaysia Centre for Development Studies, occasional paper series, Kuala Lumpur, 1974.

73. Toebes, Cornelis and Seng, Gohkain
Notes on some hydrological effects of land use changes in Peninsular Malaysia.
Ministry of Agriculture and Rural Development; Water Resources Publication No. 4, Kuala Lumpur, 1975.

74. Wong, I.F.T.
The present land use of West Malaysia (1960).
Division of Agriculture, Ministry of Agriculture and Land, Kuala Lumpur, 1971.

75. Wikkramatileke, R.
Federal land development in West Malaysia, 1957-1971.
Pacific Viewpoint 13, May 1972.

76. Wycherley, P.R.
Conservation in Malaysia, a manual on the conservation of Malaysia's renewable natural resources.
Morges, Switzerland, IUCN 1969, IUCN Publications New Series Supplementary Paper No. 22.

IV. The Sudan

77. Ahmed, Farouk H.
Position Paper on Desertification Control Activities in the Sudan (Part 2). The Projects: National, Regional, Transnational and Bilateral. Khartoum: Ministry of Agriculture, Food and Natural Resources, November 1979.

78. Arab Fund for Economic and Social Development
Basic Programme for Agricultural Development in the Democratic Republic of the Sudan 1976-1985.
Kuwait, October 1976.

79. Barbour, Kenneth Michael
The Republic of the Sudan, A Regional Geography
London, University of London Press, 1966.

80. Berry, L.
East African Country Profiles: The Republic of the Sudan.
Worcester, Massachusetts: Clark University Program for International Development, November 1977.

81. Clark University Program for International Development
African Environmental Traning: Background Brief on the Sudan.
Collaborative project with the University of North Carolina, the Southeast Consortium for International Development (SECID) and Clark University, October 1978.

82. Democratic Republic of the Sudan
Ministry of Agriculture, Food and Natural Resources
Forests Administration Annual Report, July 1974-June 1975, Khartoum, 1979.

Ministry of Finance, Planning and National Economy
Development Perspectives of the Sudan,
Khartoum, 1976.
The Economic Survey, 1978-79,
Khartoum, 1979.

Earthscan Features

84. Eckholm, Erik
Snail fever threatens the world's biggest farm.
Snail borne disease of schistosomiasis (bilharzia) has invaded the Gezira farm in the Sudan.
1978.

85. Greenfield, Mike
Green belts to halt the sand.
Agreements among North African and Sahelian countries to establish two greenbelts along the Sahara's northern and southern margins. Cites case of Sudan where Sahara pushed southward by about 100 km between 1958 and 1975.

86. Muller, Mike
Canals that bring snails and sickness.
As planners and engineers fail to cooperate with health experts, a big irrigation scheme in the Sudan will cause a further spread of the snail-borne disease bilharzia.
1976.

87. Tinker, Jon
The doomed oasis.
Desertification in the Sudanese province of Kordofan.
1977.

88. Earthscan Press Briefing Document No. 8
The Jonglei Canal.
April, 1978.

89. FAO
Savanna Development: the Sudan - A Comprehensive Technical Report.
Report prepared for the Government of the Sudan by FAO acting as executing agency for the UNDP.
Rome, 1974.

90. Helmy, Samir
Towards the full utilization of the Nile.
Cairo: MISR Press, 1955.

91. Ibrahim, Fouad N.
The problem of desertification in the Sudan with special reference to Northern Darfur Province.
Development Studies and Research Centre Monograph Series No. 8.
Khartoum, University of Khartoum, 1978.

92. Kornfeld, Leonard, et al
SUDAN-AID Involvement in Traditional Agriculture. Report prepared for AID discussing AID project to restore environmental productivity and prevent further deterioration while taking care of needs of traditional farmers.
McLean, Virginia: American Technical Assistance Corporation, May 1977.

93. Mabbut, J.A., ed.
Research and Training for Management of Arid Lands.
The United Nations University, Tokyo, 1978.

94. Murdock, Muneera Salem
The impact of agricultural development on a pastoral society: the Shukriya of the Eastern Sudan. Report submitted to AID from the State University of New York and the Institute for Development Anthropology, 1979.

95. Nimeiri, Sayed
An evaluation of the Six Year Development Plan of the Sudan (1977/78-1982/83).
Development Studies and Research Centre, Faculty of Economic and Social Studies, University of Khartoum Monograph Series No. 7.
Khartoum, University of Khartoum, January 1978.

96. Richards, Paul, ed.
African Environment, Problems and Perspectives.
London, International African Institute, 1975.

97. Shawki, M.K. and Musnad, H.
The Khartoum Green Belt.
Forests Bulletin No. 7, Khartoum 1964.

98. Thimm, Heinz-Ulrich
Development Projects in the Sudan: an Analysis of their Reports with Implications for Research and Training in Arid Land Management.
United Nations University, Tokyo 1979.

99. Thomas, M.F. and Whittington, G.W.
Environment and land use in Africa.
London, Methuen 1969.

Chapter on the Sudan, man-water relations in the east-central Sudan, describes the physical environment in the Gedaref District, Central Sudan. All information refers to the early 1960's.

100. University of Gezira
Aquatic Weed Management: Integrated Control Techniques for the Gezira Irrigation Scheme. Report of workshop December 3-6, 1978.
University of Gezira, Wad Medani.

101. Wixorn, Calvin
Range management program in the Sudan. End of tour reports.
U.S. AID, Washington, DC 1962.

V. Venezuela

102. Castellano Rohorquez, Hercilio
La planificación del ambiente en Venezuela.
Revista Interamericana de Planificación, Vol. XIII, No. 52, pp. 95-117. (Environmental Planning in Venezuela).
1979.

103. Chamber of Deputies (Venezuelan Congress)
Documento preliminar proyecto de Ley Orgánica para la Ordenación del Territorio. (Preliminary document for a territorial organization law) (mimeo.).

104. COPLANARH
Comision del Plan Nacional de Aprovechamiento de Recursos Hidraulicos (Committee for the National Development of Hydraulic Resources)
Plan Nacional de Aprovechamiento de Recursos Hidraulicos, Tomo I y II, Republica de Venezuela, (Ministerio de Obras Publicas), respectivamente. (National Development Plan, vol. II, 1. Industrial Development). 1980.

105. CORDIPLAN
Oficina Central de Coordinacion y Planificacion de la Presidencia de la Republica (National Bureau for Coordination and Planning)
VI Plan de Desarrollo de la Nacion 1981/85 (version preliminar), vol. II, 1. Industrial Development). 1980.

VI Plan de Desarrollo de la Nacion 1981/1985 (VI National Development Plan, vol. II, 2. Agricultural Development).
1980.

Politica Nacional de Ordenamiento Territorial (National Policy on Territorial Organization, Committee on Territorial Organization). (mimeo).
Caracas, 1980.

106. Esteves, Julio; Funck, Carlos; Gutman, Graciela; Kries, Rafael and Van Kesteren, Alfredo
El desarrollo reciente de la agricultura venezolana (Recent developemnt of Venezuelan Agriculture).
Vol. XI, No. 41, pps. 13-50.

MARNR
Ministerio del Ambiente y de los Recursos Renovables (Ministry of the Environment and Renewable Natural Resources).

107. 100 Acciones Prioritarias, 1977-1978 (100 Priorities for Action, 1977-1978).
1977.

108. Desarrollo de la normativa legal en materia ambiental (Development of Legal Norms on the Environment).
G. Martinez, 1977.

109. Anuario de Derecho Ambiental 1977 (Environmental Legislation Yearbook).
Caracas 1978.

110. Organizacion y Funciones, Direccion General Sectorial de Planificacion y Ordenacion del Ambiente (Organization and Function).
1978.

111. Plan Nacional de Conservacion, Defensa y Mejoramiento del Ambiente (National Plan for the Conservation, Defense and Improvement of the Environment. Industry).
1978.

112. La legislacion vigente en materia de ordenacion del territorio (Legislation on Territorial Organization).
Nelson Geigel Lope Bello.
1980.

113. Proyecto sobre normas nacionales para efluentes liquidos (Project on national norms for liquid effluents).
Luiz A. Honrado
1980.

114. Revista Ambiente (Environment Journal, several issues, especially) Special issue on a sanitary programme for the lake Valencia basin, vol. IV, No. 1).
1979.

115. Numero especial dedicado al Proyecto sobre Macro Sistemas ambientales (Special issue dedicated to the Project on Environmental Macro Systems, vol. IV, No. 2).
1980.

116. Negron, Marco
El desarrollo y las politicas regionales en Venezuela.
CENDES, Caracas (mimeo), 1978.
(Development and regional policies in Venezuela).

117. Suarez, Maria M. and Torrealba, Ricardo
Las migraciones internas en Venezuela, 1926-1971 (Internal migration in Venezuela).
Boletin de Estudios Latinoamericanos y del Caribe, No. 28.
Amsterdam 1980.

Appendix II - List of Some Key Governmental Institutions with Environmental Responsibility in Developing Countries

AFRICA

COUNTRY	KEY INSTITUTION(S)
Algeria	Ministère de L'Hydraulique, de Mise en Valeur des Terres et de la Protection de L'Environnement
Benin	Commission Nationale de L'Environnement; Ministry of Rural Development and Cooperation
Botswana	Ministry of Mineral Resources and Water Affairs; Ministry of Local Government and Lands; Ministry of Agriculture; Ministry of Health
Central African Republic	Ministry of Agriculture, Water, Forests, Hunting and Fisheries
Chad	Ministère du Developpement Agricole et Pastoral et des Calamités Naturelles
Congo (People's Republic of)	Ministry of Water and Forests; Ministry of Public Health and Social Affairs
Egypt	Ministry of Agriculture and Land Reclamation; Secretariat for Environmental Research; Ministry of Public Health
Ethiopia	Ministry of Agriculture; Ministry of Mines, Energy and Water Resources; Ministry of Public Health
Gabon	Ministry of Environment; Ministry of Agriculture
Ghana	Environmental Protection Council; Ministry of Lands and Natural Resources; Ministry of Health

AFRICA cont'd.

Guinea	Ministry of Forests and Fisheries
Ivory Coast	National Commission on the Environment; Ministry of Planning
Kenya	National Environment Secretariat; Ministry of Environment and Natural Resources
Liberia	Ministry of Local Government, Rural Development and Urban Reconstruction; Ministry of Health and Welfare
Malawi	Secretariat for Agriculture and Natural Resources
Mali	Ministry of Development (Division of Water and Forests); Ministry of Agriculture
Niger	Ministry of Rural Development; Ministry of Public Health and Social Affairs
Nigeria	Ministry of Housing and Environment
Senegal	National Commission on the Environment; Ministry of Industrial Development and the Environment; Ministry of Rural Development
Sierra Leone	Ministry of Agriculture and Forestry
Sudan	Ministry of Agriculture, Food and Natural Resources; National Committee on the Environment; Ministry of Health
Swaziland	Ministry of Agriculture
Togo	Ministry of Health; Ministry of Rural Economy (Water and Forests Service)
Tunisia	Ministère de l'Agriculture

AFRICA cont'd.

Zaire	Departement de l'Environnement, Conservation de la Nature et Tourisme
Zambia	Ministry of Lands and Natural Resources
Zimbabwe	Ministry of Natural Resources and Water Development

ASIA AND THE PACIFIC

Bangladesh	Environmental Pollution Control Board
Burma	Ministry of Health
China (People's Republic of)	Office of Environmental Protection
Fiji	Ministry of Urban Development, Housing and Social Welfare
India	Department of Environment
Indonesia	Ministry of Development and Supervision of the Environment
Korea (South-Republic of)	Office of Environment; Ministry of Agriculture and Forestry; Ministry of Health and Social Welfare
Malaysia	Ministry of Science, Technology and Environment; Ministry of Primary Industries (Forestry and Mines Departments); Ministry of Agriculture
Nepal	Ministry of Food, Agriculture and Irrigation; Ministry of Forests; Ministry of Land Reform; Ministry of Public Works and Transport; Ministry of Water and Power

ASIA AND THE PACIFIC cont'd.

Philippines	National Environmental Protection Council; National Pollution Control Commission; Ministry of Agriculture; Ministry of Human Settlements and Ecology; Ministry of Natural Resources; Ministry of Local Government and Community Development
Singapore	Ministry of the Environment
Sri Lanka	Department of Environment; Ministry of Land and Land Development; Ministry of Agricultural Development and Research; Ministry of Local Government, Housing and Construction
Thailand	National Environment Board

LATIN AMERICA AND THE CARIBBEAN

Argentina	Subsecretaria de Planeamiento Ambiental
Bahamas	Ministry of Agriculture, Fisheries and Local Government
Barbados	Ministry of Health and Welfare
Bolivia	Department of Natural Resources and Environmental Protection (Ministry of Planning and Coordination); Centro de Desarrollo Forestal (CDF), Ministry of Rural Affairs and Agriculture; Ministry of Social Welfare and Public Health
Brazil	Special Secretariat for the Environment
Colombia	Instituto de Desarollo, Recursos Naturales y del Ambiente (INDERENA)
Ecuador	Ministerio de Recursos Naturales y Energeticos; Ministerio de Agricultura y Ganaderia; Ministry of Public Health
Grenada	Department of Planning, Development and Training (Prime Minister's Office)

LATIN AMERICA AND THE CARIBBEAN, cont'd.

Guatemala	Ministerial Commission for Conservation and Improvement of the Human Environment; Ministry of Agriculture; Ministry of Public Health and Social Assistance; Ministry of Public Works and Communications
Guyana	Ministry of Economic Development (Development Secretariat)
Haiti	Division de l'Amenagement du Territoire et de l'Environnement, Department of Agriculture, Natural Resources and Rural Development (DARNDR); National Council on Environment and Erosion Control (CONAELE); Department of Public Health and Population
Honduras	Ministry of Natural Resources
Jamaica	Ministry of Mining and Natural Resources
Mexico	Undersecretariat for Environmental Improvement (Federal Health Secretariat)
Panama	Ministerio de Planification y Politica Economica
Peru	National Office for Evaluation of Natural Resources (Prime Minister's Office); Ministry of Agriculture and Food; Ministry of Health; Ministry of Housing and Construction (ONERN)
Trinidad and Tobago	Ministry of Planning and Development
Uruguay	Instituto Nacional Para la Preservacion del Medio Ambiente
Venezuela	Ministry of Environment and Renewable Natural Resources (MARNR)

NEAR EAST AND THE MIDDLE EAST

Bahrain	Ministry of Planning
Cyprus	Ministry of Agriculture and Natural Resources
Iran	Department of Environment
Jordan	Council for Human Environment Affairs; Ministry of Agriculture; Ministry of Interior for Municipal and Rural Affairs; Ministry of Tourism and Antiquities; Ministry of Health
Kuwait	Ministry of Planning, General Department of Technical Cooperation
Lebanon	Ministry of Public Health, Agriculture, Cooperatives and Housing
Malta	Ministry of Health and Environment
Oman	Council for Conservation of Environment and Prevention of Pollution
Qatar	Ministry of Industry and Agriculture
Saudi Arabia	Ministry of Municipal and Rural Affairs (Directorate-General of Environmental Health)
Syrian Arab Republic	Ministry of State for Planning
Turkey	Undersecretariat for Environmental Affairs (Prime Minister's Department)
United Arab Emirates	Ministry of Agriculture and Fisheries

Sources: Center for International Environment Information, "Government Agencies with Environmental Responsibilities in Developing Countries", April 15, 1980: Dorm-Adzobu, Clement, "Environmental Problems and Management Policies in Tropical Africa", Berlin, 1981; Various U.S. AID/MAB Country Environmental Profiles; World Environment Report.

APPENDIX III

LIST OF PEOPLE AND ORGANISATIONS CONTACTED

1. GHANA

A. Environmental Protection Council

Professor E.A. Boateng, Executive Chairman
Dr. Garbrah, Scientific Coordinator
Dr. C. Dorm-Adzobu, Senior Research Officer
Mrs. Joyce R. Mainoo, Senior Assistant Secretary

B. Ministry of Finance and Economic Planning

Mrs. M. Chinery-Hesse, Principal Secretary
Mrs. V. Ofosu-Amaah

C. Ministry of Lands, Natural Resources, Fuel and Power

Mr. D.C.K. Kudiabor Principal Secretary
Mr. E.D. Djarbeng

D. Forestry Department

Mr. J.H. Francois, Chief Conservator of Forests

E. Game and Wildlife Department

Dr. E.O. Asibey, Director

F. Geological Survey

Mr. G.O. Kesse, Director
Mr. J.K. A. Banson, Deputy Director

G. Ghana Chamber of Mines

Mr. Sam Poku, Executive Director

H. Volta River Authority

Mr. Nanka-Bruce, Deputy Chief Executive
Dr. L.K.A. Derban, Chief, Health Unit
Mr. F.V.L. Laryea, Chief, Resettlement Programme

I. Ghana Water and Sewerage Corporation

Mr. K.M. Addison, Chief Engineer
Mr. Saani, Chief, Water Quality Control Unit

J. Ministry of Agriculture

Mr. J.N.N. Adjetey, Director-General of Agriculture

K. Irrigation Development Authority

Mr. A.N. Aryeetey, Deputy Chief Executive

L. Ministry of Health

Mr. Noye-Mortey, Chief, Environmental Health Unit

M. Ministry of Industries, Science and Technology

Miss A.V.A. Wood, Principal State Attorney, Legal Division

N. Town and Country Planning Department

Mr. Obuobisa, Director
Mr. Tieku, Town Planning Officer
Mr. Nannor, Planning Officer

O. Ministry of Local Government

Mr. Pepprah, Principal Secretary

P. Ghana Standards Board

Dr. L. Twum-Danso, Director
Mr. Boateng

2. MALAYSIA

A. Ministry of Science, Technology and Environment - Kuala Lumpur

Hon. Tan Sri Ong. Kee Hui, Minister

Division of Environment

Mr. S.T. Sundram, Director-General
Enc. Ghazali bin Mohd Noor, Principal Assistant Secretary
Mr. A. Maheswaran, Director, Water Pollution Control Unit
Mr. K.S. Goh, Director, Air Pollution Control Unit
Mr. Patrick Tan Hock, Officer, Marine Pollution Control
Ms. Hasmah Harun, Public Relations and Information Officer
Ms. Narimah, Effluent Control Inspector

Department of Wildlife and National Parks

Enc. Mohamed Khan, Director-General
Mr. Louis Ratnam, Senior Research Officer

B. Ministry of Primary Industries

Enc. Ghazali bin Mohd Amin, Undersecretary
Mr. Chue Hang Cheong, Minerals Economist, Mines Department
Mr. Chun Tet Foong, Deputy Senior Inspector of Mines, Mines Department
Dato Muhammad Jabil, Director-General, Forestry Department

C. Ministry of Agriculture and Rural Development

Mr. Ahmad Salimi Ismail, Deputy Principal-Secretary, Development Division
Dr. Pathan S. Ali, Deputy Director-General, Fisheries Department
Mr. Balasubramaniem, Department of Agriculture, Crop Protection Branch
Mr. Chong Chin Meow, Drainage and Irrigation Department
Dr. Mustaffa Babjee, Livestock Division
Mr. Ignatius Wong, Department of Agriculture, Soils Branch

D. Prime Minister's Office - Economic Planning Unit

Mr. K. Kananatu, Energy Projects Division
Mr. Kamarulzaman b. Abd Ghani, Energy Projects Division
En. Saderi Jack, Industry Division

E. National Petroleum Corporation - Petronas

Mr. A. Abuzarin

F. Elmina Palm Oil Mill, S-Buloh

Mr. Loh, Assistant Manager
Mr. Velu, Effluent Controller

G. Antara Oil Palm Pollution Control Sdn. Bhd.

Mr. Mike Choong, Marketing Manager

H. Universiti Pertanian Malaysia

Professor Ariffin Suhaimi, Dean, Faculty of Science and Environmental Studies

I. University of Malaya

Professor Jose Furtado, Department of Zoology
Mr. Sulaiman Abdullah, Faculty of Law

J. Environmental Protection Society of Malaysia, EPSM

Mr. Gurmit Singh, President

K. Consumers Association of Penang

Mr. Rajeandran, Environmental Research Officer

L. Embassy of the United States of America, Kuala Lumpur

Mr. James McGlinchey, Economic/Commercial Officer

3. THE SUDAN

A. Ministry of Agriculture, Food and Natural Resources

Dr. Abdel Aziz Bayoumi, Undersecretary for Natural Resources
Dr. Tawfiq Hashim Ahmed, Director-General for Planning and Administration

Land Use, Soil Conservation and Water Programming Department

Dr. Hassan Mohamedin, Director
Dr. Mawiya Mustafa

Range Management and Pasture Department

Dr. Ali Deraj, Director
Dr. Suleiman Abdalla, Range Management Specialist
Mr. Mohamed Fadl el Mula, Head of Natural Range Management Sector

Forestry Department

Dr. Kamal Hassan Badi, Director
Dr. Zakaria A. Saad, Head, Afforestation and Shelterbelts Section

Wildlife Department

Dr. Abu Sineina, Director
Dr. Mahgoub el Bedawi, Head of Game Preservation Section

Desert Encroachment Control and Rehabilitation Programme (DECARP) Coordinating Unit

Dr. Farouk Ahmed, Coordinator

B. Ministry of Irrigation

The Undersecretary, Dr. Grassim O. Hassan
Dr. Abbas Haddayda, Consultant and Irrigation Advisor
Dr. Kamal Ali, Nile Water Department and Member of the Permanent Joint Technical Commission

C. Ministry of Health

Dr. Zuhair Noor, Malaria Control Unit

D. National Council for Research

Dr. Saad Abbadi, Secretary General
Dr. Mohamed O.H. El Karori, Director, Agricultural Research Council
Dr. Amin, Director, Medical Research Council
Dr. Wadie Yawni Magar, Director, External Relations and Scientific Editor

E. National Document Center

Mr. Tofiq al Rahim Manour, Reference Librarian
Ms. Cecile Wesley

F. Attorney-General's Department

The Undersecretary, Mr. Tijani Osman
Mr. El Fatih, Contracts and International Agreements Department

G. University of Khartoum

Deputy Vice Chancellor, Professor Faisal Tag el Din

Department of Geography
Dr. Mustafa Khogali, Acting Head
Dr. Yacoub Abdalla Mohamed
Dr. Mohammed el Hadi Abu Sin

Faculty of Law
Ms. Dina Sheikh el Din
Dr. Akolder Tier

Institute of Environmental Studies
Dr. M.D. el Khalifa, Chairman
Professor Joe Whitney (Advisor, University of Toronto)
Dr. Tag el Seed (Aquatic Biology) and Director

H. Gezira Scheme

Abdel Aziz Ibrahim el Rayel, Senior Information and Publications Office

I. Sennar

Frank Hodgson, UNDP

J. Damasin (Rosieres Dam)

Floyd M. McGrath, USAID Blue Nile Project
Linda Fruzetti, Anthropologist, Consultant

K. Malakal

David Wild, FAO Fisheries Project

L. Juba
George Patenas, UNDP Regional Representative

M. Ford Foundation

Mr. Norman Singer, Assistant Representative
Piero Bronzi, Agricultural Programme Officer
John Gerhart. Representative for the Middle East and North Africa

N. Sudan Society for the Protection of the Environment

Dr. Tijani Alaam, Chairman

O. USAID Mission

Mr. Arthur Mudge, Mission Director

P. Others

Mr. Anwar Abdu, Ford Foundation Fellow, Clark University
Dr. Kamal Agabawi, Former Minister of Agriculture
Dr. Omer el Agraa, IIED Fellow, Lecturer, Faculty of Architecture, University of Khartoum
Dr. Yahia Abdel Magin, Former Minister of Irrigation
Mr. Khalil Osmān, President, Gulf International

4. VENEZUELA

Ministry of Environment and Renewable Natural Resources

Various officials

5. COMMONWEALTH SECRETARIAT

Mr. Christian de Laet, Science Advisor, Commonwealth Science Council
Dr. D. Ali, Deputy Secretary, Commonwealth Science Council
Mr. Jeremy Pope, Assistant Director, Legal Division

6. EAST-WEST ENVIRONMENT AND POLICY INSTITUTE - EAST-WEST CENTER, UNIVERSITY OF HAWAII

Dr. Richard Carpenter, Research Associate
Mr. Abu Bakr Jafaar

7. FOOD AND AGRICULTURAL ORGANISATION OF THE UNITED NATIONS (FAO)

Mr. Jean Pierre Dobbert, Legal Counsel
Mr. Dante Caponera, Chief Legislation Branch
Mr. Dominique Alheritiere, Legal Officer, Environmental Law

8. INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION (IMCO)

Captain John L. Thompson, Technical Officer
Mr. John Wenhan, Environmental Advisor

9. INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES (IUCN)

Mr. Jacques Berney, Executive Director CITES
Mr. Obdullio Menghi, CITES Secretariat
Mr. Bernardo Zentilli, Programme Officer, Latin America
Dr. Wee-Lek Chew, Programme Officer, Asia, Australasia, and the Pacific

0. OVERSEAS DEVELOPMENT ADMINISTRATION (ODA) UNITED KINGDOM

Mr. David Hall, Environmental Advisor
Mr. R.S. Ridgewell, Loan Officer, Ghana
Mr. James Henry, Forestry Advisor
Mr. David Turner, Loan Officer, Sudan

1. UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

Mr. Jo Wadda, Regional Information Officer for Africa

2. UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

Ms. Patricia Bliss-Guest, Regional Seas Programme
Ms. Sachiko Kuwabara, Environmental Law Officer

13. WORLD HEALTH ORGANISATION (WHO)

Dr. Cooper, Acting Chief, Office of Publications
Mr. Cook, Office of Health Legislation

APPENDIX IV

Subjects which require further research

The bulk of this report has been devoted to examining the prerequisites for improving overall environmental management in developing countries. During the course of the research conducted for this project, certain subject areas were identified as being in need of more detailed analysis. This conclusion was arrived at from one or more of the following factors: the lack of articulation of an appropriate national policy on these sectors; the lack of institutional coverage; the importance (or potential importance) of these sectors in a country's economy and/or the success of any environmental management strategy; and the potential for regional cooperation in the development and implementation of an appropriate policy for environmental control in that sector. The main sectors identified for these purposes are coastal zone management, land use planning and agro-industrial waste management.

Coastal Zone Management and Marine Matters

As has been noted, all four study countries are coastal countries, located in some of the most heavily traveled regional seas of the world -- the Gulf of Guinea (Ghana); the South China Sea and the Strait of Malacca (Malaysia); the Red Sea (the Sudan); and the Caribbean (Venezuela). All these coastal regions have unique ecosystems (ranging from Red Sea brine to coral reefs of the Caribbean). All are threatened by oil pollution from tanker traffic, offshore hydrocarbon exploration and exploitation; and marine pollution arising from land-based sources such as coastal outfalls and polluted rivers. Yet, in none of these countries is there a detailed policy for coastal zone management.

For the most part, existing legislation relates to oil pollution control, mainly ratifying the 1952 International Convention on the Prevention of Pollution of the Sea by Oil, 1954. As far as institutional coverage is concerned, responsibilities are generally divided between the appropriate agencies for transportation (navigation) and fisheries. With regard to information on the status of development, projected plans for development, etc., the situation leaves much to be desired. Such information is lacking, or where it exists it raises more questions than it answers. For example, the Saudi-Sudanese Joint Commission for the Development of the Red Sea Resources (established in 1975) currently has a six-year program to mine the area called Atlantis II -- which has the most promising hot brine area studied so far. The Sudan does not have the technology, manpower, expertise or financial resources that are required to ensure that the project does not entail any adverse effect on the Red Sea ecology.

An added dimension of the problem is the important role of fisheries in the economies and diet of coastal countries. With the adoption of the now popular concept of an exclusive economic zone (eez) proposed by the U.N. Conference on the Law of the Sea, the need for a well-defined policy with detailed management legislation, institutions and programs will be necessary. In some situations, the magnitude of the problem is reflected in the size of the area under consideration. For example, in Malaysia, the Fisheries Department of the Ministry of Agriculture estimates that with the adoption of a 200 eez, the area under national jurisdiction will be about four times the total land area. In the Gulf of Guinea, coastal erosion, especially around the lagoonal areas, continues to be a major problem with a few examples of towns being washed away. Consequently, there is a need for sound policies and

programs for rehabilitation of these highly susceptible areas. The potential for regional (interstate) cooperation in this sector is extremely high. UNEP has initiated activities which are designed to develop action programmes for environmental protection in the various regional seas. Nevertheless, further action is required, particularly in-depth studies at the country, or even regional (in country), level to determine needs (policies, institutions and management). Also, these activities will be helpful in highlighting requisite areas for concentrated efforts and pilot projects. Such activities will not be duplicating the work that is being carried out by UNEP (which in the main involves efforts to achieve international agreements on the subject matter). They ought to be problem-identification and resolving studies with a high potential for replicability in other countries, or regions, and which provide a worthwhile input to the UNEP initiative.

Land Use Planning

This topic permeates all aspects of environmental management, from major sectors such as agriculture, forestry and industry to specific programs such as soil conservation, erosion control, river basin development and irrigation and drainage. The existence of a comprehensive land use plan has a beneficial impct on all management activities, if land and water are considered as the capital resources upon which management programs are based. This report has attempted to illustrate the vital importance of a land use policy by examining the detrimental effect of the lack of such a policy in one country -- the Sudan. No doubt, other examples can be found in many other countries, either on a nation-wide basis or by region. This conclusion is reinforced

by the WCS' citing of soil and water conservation as an aspect of environmental management which requires special attention if countries' capacity to manage resources are to be improved.

Land use planning is a subject matter in which foreign assistance is particularly appropriate, and many international organizations have already taken some noteworthy initiatives. In so doing, some, such as FAO, have amassed a considerable wealth of expertise and information on this subject. Further, the various approaches to land use or spatial planning that is adopted in many of the developed countries may offer extremely useful and practical examples from which developing countries can learn. The magnitude of the task involved cannot be underestimated. Technical and scientific surveys will have to be conducted, assessments or evaluations will have to be conducted, a policy will have to be formulated and institutions and laws will have to be designed. The research for this project has indicated that in some countries the problem is acute and is a major hindrance to the development and implementation of a sound environmental management policy. Consequently, it is a subject which requires a more concentrated effort on behalf of organizations and individuals working in this field.

Management of Agro-industrial Wastes

Although many developing countries are diversifying their economy to place more emphasis on industry, in many of these countries the bulk of industrial activities involve the primary processing of agricultural or forest products (such as palm nuts, pineapple, rubber, sugar, etc) for export. These industries have their own peculiar environmental components, which have not been fully understood. This dearth of

knowledge stems from the relative infancy of the industries in the developing country context. This report has highlighted the environmental impact of two main agro-industrial activities (rubber and palm oil production) in Malaysia. The remarkable successes in the field of waste management and effluent control in those two industries has been noted. With the increasing importance of this type of industrial activity in developing countries, the need for more studies to examine the impact of such activities on the environment and to examine means for alleviating them will be more and more acutely felt.

The subject is of particular importance as it represents one area where many of the theories of environmental management within the context of development are placed in extremely sharp focus. Many of the topics discussed in this report -- agricultural production, the impact of industrial development on the environment, land and water use, environmental planning and assessment -- all feature very prominently in this topic alone. Further, this is one area where there is a high potential for the merger of economic and environmental appraisal of projects. As is often the case, there is very little information on any detailed studies in this field. The FAO in 1977 conducted a seminar on residue utilization and waste management in the agricultural sector. The bulk of the case studies were from the developed countries. More information on these activities in the developing country situation is necessary if countries (particularly those which are now considering embarking on a course of agro-industrial development) are to make sound judgments on the management of such residues and wastes.
In a world which is increasingly becoming aware of the need for sustainability as a fundamental component and prerequisite of development,

this topic has all the characteristics of a perfect case study on environmental management. In addition to the various linkages between environment and development that it represents, there is a considerable potential for the recycling of resources, a very important component of conservation. And as has been shown in the case of Malaysia, the possibility of developing useful by-products from such waste treatment processes (in that case fertilizers) is not only a sound resource use policy, but an economically advantageous one as well.