Environmental Legislation in Developing Countries: Some Parameters and Constraints

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INTRODUCTION

Environmental laws are not always regarded as useful or effective by decision makers in the fields of resource management and international economic aid. Some critics suggest that environmental laws do not make any difference, while others argue that these laws do not respond to the needs of individual countries and that legislation can be an obstacle to progress rather than a useful instrument for environmental management.

These criticisms are not entirely undeserved. Can environmental legislation actually help solve environmental problems, especially in less developed countries (LDCs)? The argument here is that it can, but that officials who draft and implement environmental legislation in LDCs need to examine carefully both their conceptual approach to environmental legislation and the practical application of these laws to environmental problems.

The primary problem with environmental legislation is not the great variety of human or natural resource systems. In most jurisdictions, the major constraints are conceptual and structural. Environmental law should not be understood as just another new system of rules and agencies. Rather, it must be viewed as part of ecomanagement—a comprehensive process of resource management, informed by ecosystemic knowledge, and progressively integrated with economic development planning. This conception of environmental law provides a general reference model for drafting and implementing legislation.[1]

Less developed countries suffer from indigenous constraints beyond

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1. For a detailed exploration of this conception of environmental law, see UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), MANUAL ON ENVIRONMENTAL LEGISLATION (1979) (prepared by J. Mayda).

the conceptual constraints common to all countries. In general, most LDCs have more severe environmental problems and fewer resources to solve them than most developed nations. Many LDCs need to modernize their environmental laws, but to be effective, the new legislation will need to be accompanied by additional institutional developments. Specifically, environmental legislation must be accompanied by a substantial increase in each nation's capability for policy development, institutional structures, administrative competence, and ability to train management, monitoring, and enforcement personnel. External assistance to LDCs must be reoriented and coordinated to promote this broad, integrated, and sustainable approach to ecomanagement.

This Perspective[2] develops a conceptual framework for thinking about environmental legislation, reviews the constraints likely to inhibit the effectiveness of environmental legislation in LDCs, and presents the author's synthesis and recommendations.

I
CONCEPTUAL FRAMEWORK

A. Developing a Model for Environmental Legislation

1. Does Diversity Prevent a Common Approach?

The more than 125 United Nations members who comprise, or count themselves among, the less developed countries are diverse in almost every respect. They vary in size, location (topography, climate, access to sea, etc.), endowment with natural and human resources, and economic, social, and political systems. On first impression, it might appear impossible to design models that could be used by all LDCs to improve the effectiveness of environmental legislation and thereby check or reverse environmental deterioration or destruction.

This argument is based on the assumption that there is a linear relation between, on the one hand, the variety of the human and environmental systems and, on the other hand, the difficulty to manage and protect them. With regard to legislation as a mechanism of management, it implies a difficulty in providing standardized patterns, easy to enact and to administer with the limited means available to the LDCs.

In the face of this double misperception, it is possible to understand the wish of some practitioners to simplify or mechanize the lawmaking task with the help of "cookbook"—or "printed circuit"—type models. This is analogous to the current belief in the field of environmental impact assessment that, if only enough matrices or checklists can be

2. [Ed. note: The title "Perspective" denotes an article that combines legal and policy research with the author's personal observations and conclusions drawn from his or her extensive involvement in the field. This Perspective reflect the author's experience with technical assistance missions in the field of environmental legislation over the last ten years.]

designed to cover the major categories of actions or projects, the major difficulties of impact assessment will be overcome.

These assumptions are put in doubt by both practice and empirical theory. The real world is more subtle and complicated and, yet, easier to conceptualize correctly. Instead of being overwhelmed by the apparent variety and differences, we should look for system similarities. We are likely to find that (a) the factors that control the parameters and constraints in the field of environmental legislation are not physical-material but conceptual-procedural, and (b) to conceptualize a common procedural framework for legislation is easier than it first appears.

2. *Using the Correct Conception of Law*

Despite references to policy in judicial decisions and academic discourse, "practical" lawyers typically view law as a set of substantive rules. From this perspective, the principal, if not only, characteristic of legislation is rulemaking. Since nations have different needs, perceptions, traditions, and capabilities, they frequently conceptualize problems differently, express them in different terms, and solve them with different forms of legislation. As a result, the laws of different nations tend to look more diverse than similar. Put another way, any view of law that emphasizes the structure and normative content of the laws themselves will inevitably focus on the differences rather than similarities between law in different nations.

Altering this focus and perspective drastically affects any comparison of legal systems. If law is perceived as a process—a means to achieve recognized policy goals—rather than a set of rules, it is possible to see similarities among nations. For example, a comparison of civil law and common law countries on both sides of the Atlantic shows that the similarities between systems that serve comparable socioeconomic needs are greater than the differences in semantics, structures, and methods.[3]

In the field of environmental law, this functional analysis indicates the need to distinguish between two aspects of environmental legislation. On the one hand, the variety of human ecosystems requires that each lawmaking act be performed individually, rather than adopting prefabricated models. On the other hand, it is possible to identify the elements and methods common to all well-designed systems of environmental law. In particular, the basic linkage Ecology-Policy-Law-Implementation and the goals, means, and approaches derived from it, are highly comparable between countries with quite different socio-economic indicators. This implies the possibility and poses the task to develop models that can as-

3. This conclusion, and its underlying empirical theory of law as a process of implementing policies, is discussed in J. MAYDA, FRANÇOIS GÉNY AND MODERN JURISPRUDENCE (1978), especially at 1-2, 65, 88-89, 97, 113-14.

sist nations on different levels of development and with different types of environmental problems.

3. *The Need for an Expansive View of the Environment and Environmental Legislation*

Legislation is sometimes viewed as a normative response to discrete, specific problems. When this view prevails in a given field, legislators tend to concentrate on and limit themselves to the most pressing, immediate issues. Environmental legislation has frequently taken on this characteristic and, as a consequence, there is widespread identification of environmental problems with pollution, often to the virtual exclusion of everything else. The narrowness of this view can be compared to viewing all of medicine only in terms of pathology.

The natural environment is a complex phenomenon and its definition and conceptualization for the purposes of developing laws must be correspondingly comprehensive. The environment is properly viewed as the system of resources that supports human life and serves other human needs. The term "human environment," coined to represent this concept, has since been popularized by the United States National Environmental Policy Act of 1969 (NEPA)[4] and by the 1972 United Nations Conference on the Human Environment.[5]

The concept of human environment has several important implications. First, it illustrates that every human community trying to solve environmental problems will encounter similar basic parameters and constraints. Ecosystemic limitations and the need to allocate resources among competing interests are examples of such constraints. Second, it reveals the importance of utilizing principles and information from both the natural and social sciences to inform the development and implementation of environmental laws. To be effective, the field of environmental law must employ techniques from disciplines as varied as engineering, policy research and development, resource management, public administration, and, of course, law. To integrate this range of material, environmental lawyers must borrow, where possible, from such established fields as tort and property law, but above all they must go back to the drawing

4. 42 U.S.C. § 4321 (1982).

5. REPORT OF THE UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT, 5-16 JUNE 1972, U.N. Doc. A/CONF.48/14/REV. 1 (1973). The United States Council on Environmental Quality reemphasized the concept of the human environment in the amended NEPA implementation regulations of 1979. 40 C.F.R. §§ 1502.3, 1502.22, 1508.14 (1985). The term "human ecosystem" is technically more precise than the term "human environment," not only because of its focus on the human uses of natural resources, but also because it expresses the growing awareness that even predominantly human-made systems, such as urban areas or motor vehicle transportation systems, respond to basic ecosystemic principles. Mayda, *The Ecology of Change: Toward Planetary Ecomanagement*, in CREATING THE FUTURE: AGENDAS FOR TOMORROW—INTERNATIONAL SYMPOSIUM III, OCTOBER 1974 (G. Dalen & C. Tipton eds. 1974); UNEP, *supra* note 1, at 105-08.

board and create new doctrines rather than stretch existing ones to the breaking point.[6]

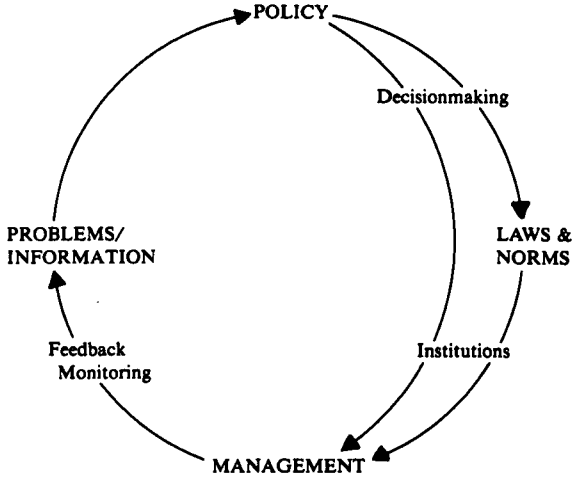
Third, from an environmental management perspective, the concept of human environment is needed to permit intersectoral[7] coordination and a unified policy focus from which specific policies and solutions can be derived with a satisfactory degree of internal consistency. Fourth, this comprehensive definition also provides a coherent frame of reference for drafting and administering all types and levels of environmental legislation. Fifth, and most importantly, the notion of a human environment points out the need for a comprehensive management system that is capable of addressing the full range of environmental issues, from pollution abatement to the rational use and protection of all resources.

B. Basic Parameters of an Ecomanagement System

When environmental law is guided by ecological principles, such as carrying capacity, recovery, adaptiveness, and homeostasis,[8] it is properly termed ecomanagement.[9] The essential components of a national (or regional) ecomanagement system can be schematized in the following manner:

Figure 1

Components of a National Ecomanagement System



6. Mayda, *The Penal Protection of the Environment, Law in the U.S.A. in the Bicentennial Era*, 26 AM. J. COMP. L. 471 (Supp. 1978).

7. A "sector" is a discrete unit of government, management, production, resources, or any other sub-set of a larger programmatic whole.

8. For a discussion of ecological principles and their application to management systems, see, among others, E. ODUM, FUNDAMENTALS OF ECOLOGY (1971) and ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT (C. Holling ed. 1978).

9. J. MAYDA, ENVIRONMENT AND RESOURCES: FROM CONSERVATION TO

This simple diagram is fully developed and discussed at length in the United Nations Environment Programme's *Manual on Environmental Legislation.*[10] For the purposes of this paper, only two major points of interpretation are required.

First, in this model, law plays only a limited role in the whole system of ecomanagement. Law requires problem definition, the availability of accurate information, and consistent policy development based on both. In other words, the environment cannot be effectively managed without law, but even the "best" legislation alone will not suffice. The function of legislation is mainly to (i) reflect the policies formulated by each individual nation, (ii) provide a framework of institutional mandates, powers, standards, and means for ecomanagement, and (iii) build in flexibility to permit executive adaptation to changing problems and formal revision when major policy goals are involved.

Second, the system does not always function through the complete cycle of "Problems/Information—Policy—Law—Management." The complete cycle represents the stages necessary for the formulation or modification of environmental laws. In daily operations which do not make law but implement it, the more important link is that between policy and management. This is part of a shorter cycle, "Problems/Information—Policy—Management," also shown on the diagram. Both cycles pass through the stage of "Decisionmaking" and share a common, unified basis in "Policy" as postulated above.

Both cycles also include the category "Institutions." Institutions are created by laws for the purpose of executing decisions about management. When decisions involve the allocation of new funding, the process has to go through the "Law" stage, since budget decisions are usually either reserved to legislatures or require their formal consent. When decisions involve the spending of previously allocated funds, they can usually be made by the institutions themselves without the oversight of the legislature.

ECOMANAGEMENT viii, 110-44 (1967). Ecomanagement must be distinguished from the very limited concept of "ecodevelopment." The concept of ecodevelopment has widely circulated, in part, because it served as an organizational concept for the United Nations Environment Programme until about 1980-81. When writers in the field of development planning and economics intuitively searched for an ecomanagement-like concept, they sometimes used the term ecodevelopment to portray a comprehensive decisionmaking matrix. Ecodevelopment's proper scope and meaning from the beginning, however, was strictly limited to local development within available resource and technology limits. UNEP, *supra* note 1, at 104-05, 109. This more limited definition is implicit in the WORLD CONSERVATION STRATEGY. *See* INT'L UNION FOR CONSERVATION OF NATURE AND NAT. RESOURCES (IUCN), WORLD CONSERVATION STRATEGY: LIVING RESOURCE CONSERVATION FOR SUSTAINABLE DEVELOPMENT § 14 (1980).

10. UNEP, *supra* note 1, at 13-83. To keep this figure simple, many complexities, including feedback loops, have been eliminated.

1. Environmental Impact Assessment: A Practical Application of the Ecomanagement System

Environmental impact assessment (EIA) is a generic term for an exercise which has been variously labeled environmental impact statement, analysis, study, or evaluation. The steps typically involved in this exercise are summarized by section 102 of NEPA.[11] Section 102 provides, in part, that officials responsible for major actions shall prepare a detailed statement on:

> (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.[12]

An effective EIA is usually based on a legislative mandate and the regulatory standards and procedures derived from it. A properly executed EIA, however, is itself a specific exercise in policy development, *i.e.* a determination of what can and should be done with a problem on the basis of the best available data.[13]

This exercise is, by definition, an integrated assessment.[14] It is not a mere appendix to prior considerations of, or even decisions about, the technical feasibility and economic cost of a proposed solution (the "internal" cost). Rather, it serves as a vehicle for a complete benefit-cost analysis that considers the "external" costs[15] and possible alternatives,[16] as

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11. 42 U.S.C. § 4332.

12. *Id.*

13. J. MAYDA, POLICY R & D: OUTLINE OF A METHODOLOGY, WITH REFERENCE TO DECISION MAKING IN THE FIELD OF ENERGY, TRANSPORTATION, AND ENVIRONMENT 1, 27-30 (Center for Energy and Env't Research No. X-49, 1979).

14. Environmental law has made a major contribution to the goal of integration of environmental concerns and of socioeconomic development planning in the form of EIA, which is simply ecomanagement "writ small." Mayda, *Impact of Environmental Concerns on Social Sciences: Law and Ecomanagement*, 53 REV. JUR. U.P.R. 417 (1985).

15. In addition to data about the natural environment, relevant categories of "external" data include among other things: social facts and prospects, internal and external economic interests, the availability of institutional and human management resources and protective technologies, and decisional and political factors and limitations.

16. The United States environmental impact assessment law, for example, mandates that all agencies shall: "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment; . . . include in every [environmental impact statement] . . . a detailed statement [on] alternatives to the proposed action . . . ." NEPA § 102, 42 U.S.C. § 4332. The goal of examining alternatives is basic to the origin and model of all environmental impact assessment systems, although this goal is less than perfectly implemented. *See* COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL IMPACT STATEMENTS: AN ANALYSIS OF SIX YEARS' EXPERIENCE BY SEVENTY FEDERAL AGENCIES (March 1976).

well as internal costs. The goal of this broad perspective is to determine the course of action that will result in the most favorable environmental impact or, viewed another way, cause the least amount of external costs.

The use of EIA is not limited to individual projects. This policy tool can be used to assess longer-term or broader policies, programs, and plans as well as their legislative expression.[17] In short, "environmental" impact assessment is an ideal vehicle for integrated national development planning.[18] This broad use of EIA is increasingly recognized as central to effective ecomanagement.[19]

2. *Environmental Legislation and Economic Development Planning*

If environmental legislation is understood as a component of the human ecosystem, *i.e.* one of the tools for ecomanagement, it becomes necessary to define its position with respect to the other major type of government activity that manages resources, namely economic development planning. Although economic development planning is not usually compared to environmental legislation, they are similar in that both activities have as their goal the transformation and improvement of the entire human ecosystem.

In less developed countries, economic development planning typically involves the exploitation of local natural resources with the help of external financial and technical resources. This approach tends to obscure the ultimate dependence of each nation on its own environmental resources. For example, the indiscriminate transfer of planning concepts

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17. This practice was first developed in the United States under NEPA, 42 U.S.C. § 4332. *See also* ENVIRONMENTAL IMPACT ASSESSMENT: PRINCIPLES AND PROCEDURES (SCOPE Report 5, R. Munn ed. 1975).

18. *See, e.g.*, Mayda, *Environmental Impact Assessment as an Instrument of Public Policy*, in SEXTO SIMPOSIO DE LOS RECUROS NATURALES 1 (Departamento de Recursos Naturales, Puerto Rico 1979); J. Mayda, Environmental Assessment as an Instrument for the Development and Implementation of Environmental Law (Aug. 10, 1981) (UNEP/IG.28/Background Doc. No. 3 prepared for Ad Hoc Meeting of Senior Government Officials Expert in Environmental Law, Montevideo, Uruguay); J. Mayda, Environmental Impact Assessment: Prolegomena to a Legal Regime Governing Seabed Activities in the Mediterranean (Dec. 12, 1978) (paper presented at the Meeting of Experts on the Legal Aspects of Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil in the Mediterranean). The Montevideo meeting adopted EIA as an "element of strategy" in the areas of proposed international and global environmental legislation. It also expressly recommended the integration of economic development and environmental management. *See also* IUCN, *supra* note 9, §§ 9, 11.

19. This characterization of EIA represents a significant conceptual development since the early use of the phrase "environmental assessment" by the Stockholm Action Plan of 1972. That plan set up the United Nations Environment Programme on the basis of a conceptual triad: environmental assessment, environmental management, and supporting measures. This scheme left key operational concepts and factors, such as policy and law, dangling. It replaced "policy" with the amorphous concept of "goal setting and planning" which was included in "assessment" and it did not specify whether law was a part of "management" or a "supporting measure." UNEP, *supra* note 1, paras. 3.19-3.20.

and technology aimed at agro-industrial development neglects and even harms the potential to improve traditional farming methods and crops with the aid of simple, adequate technology (*i.e.* technology tailored to the particular population, habitat, means, capabilities, and traditions of any given area). This pattern of development has a devastating effect on those environmental resources that support the basic human need for food.

This development pattern can be described as the substitution of financial schemes for organic development. The consequences of this approach can be seen in such great debtor nations as Mexico, Venezuela, and Brazil. These nations incurred enormous debts without realizing any measurable effect on their basic problem—the growing disequilibrium between their population and its demand for resources. Even where these countries developed environmental legislation and adapted their institutions, they were not able to cure the defects of this pattern of development because the two schemes were not adequately connected.[20] A preferable model for development in LDCs is one that integrates economic development planning and ecomanagement to produce sustainable socioeconomic development.

C. Summary

Ecomanagement is management of the human environment according to ecological principles. To facilitate ecomanagement, environmental law should synthesize concepts and information from a variety of disciplines and develop its own body of doctrine. Each particular law should

20. Venezuela, for example, announced a five-year economic plan at almost the same time it enacted the Ley Orgánica del Ambiente de 6-15-76 (Organic Environmental Act of 1976). G.O. no. 31,004, 6-16-76. The economic crash came less than a decade later; the environment deteriorated at a progressive rate during this entire time. Brazil, the development "miracle" of the 1970's, in open disregard of the warnings of local and international environmental experts, went without environmental legislation until 1981 when the Lei N. 6.938, de 31 Agosto de 1981 Da Política Nacional do Meio Ambiente (National Environmental Policy Law) was passed. That legislation has not yet been widely implemented.

Numerous major development projects illustrate either a) how one or several major categories of "external" data were not considered at all, or the data were listed and analyzed, but did not affect the final recommendation or decision; or b) how a major decisional ingredient was implicitly counted upon, although it did not exist. For example, the excellent EIA prepared for the Senegal River Basin project of the Organization for the Development of the Senegal River (Organisation pour la mise en valeur du bassin fleuve Sénégal, OVSM) (draft 1980, final report 1981), illustrates both items: (i) the project was recommended in spite of socio-economic projections which showed that as a result of the project, the population would increase to a point where it would exceed by 2025 the increased carrying capacity of the basin which the project would generate; (ii) the assessment's favorable recommendations were made contingent on a number of measures in the field of environmental resource management and protection. Only one of the participating states, however, Senegal, had the barest beginnings of institutionalized ecomanagement. The other two, Mauritania and Mali, did not have then, nor have they established since, any institutional resources that could implement the environmental conditions under which the project was assessed and recommended.

be seen as part of a comprehensive process of resource management for sustained human benefit, rather than an ad hoc response to discrete, specific problems. Environmental laws as a whole should attempt to coordinate the various sectors and policies that currently relate to the human environment in a fragmented manner. The process of environmental legislation should facilitate the development of a unified policy focus that can serve as a frame of reference for all decisions that relate to the management of resources. To accomplish this goal, environmental law must be integrated with economic planning.

The environmental impact assessment model is an ideal vehicle for environmental decisionmaking, including lawmaking. From specific project assessment to ecomanagement and socioeconomic planning, environmental impact assessment promotes an organic, integrated, and comprehensive approach. The mechanistic transfer of standardized codes or similar legislative shortcuts oversimplifies environmental problems and eliminates use of the legislative process as a forum for policy development.. Unlike a mechanistic approach, the procedural environmental impact assessment model encourages each nation to engage in its own individualized exercise of ecomanagement along guidelines that appear to be effective in other nations.

Nations are likely to encounter similar parameters and constraints when they attempt to draft, adopt, and implement environmental laws according to the environmental impact assessment model of decisionmaking. The next section of this Perspective explores the context in which most LDCs have to practice ecomanagement and highlights significant problems, limitations, demands, and realities they will probably face in the course of trying to improve their environmental practices. The final section of the Perspective explores the author's suggestions as to how to overcome or address these difficulties.

II
COMMON CONSTRAINTS

A. Constraints Operative in All Countries

There are at least four groups of constraints on effective environmental legislation that are common, in varying degrees and combinations, to virtually all countries.

1. Lack of Implementation

Many, if not most, environmental laws are never implemented. As a result, the effectiveness of a country's ecomanagement system cannot necessarily be measured by the number of environmental laws they pass. The United Nations Comisión Economica para America Latina de-

scribed lack of implementation as a major constraint on the effectiveness of environmental laws almost ten years ago:

> Legislation is really not the critical factor in environmental improvement. Legislation does not guarantee that the intent of the legislator will be implemented. The major practical problems result from difficulty to set up control and enforcement mechanisms to apply the legal provisions. In the first place, a considerable portion of the laws has never been expressed in regulations. Their application is therefore pending. In the second place, the difficulty to establish effective systems of control and enforcement frequently exceeds the capability of the public sector.[21]

2. *Regulatory Power of Environmental Law*

Despite implementation problems, legislation does have a reputation for effectiveness. Thus, even in developed countries, environmental legislation is seen as a limitation on the ability of private and government entities to make economic choices. This is especially true when short-term economic goals are in the foreground or when political power is unstable because of competing socio-economic philosophies. When policy makers fear that environmental legislation may constrict economic decisionmaking, they sometimes resist the formulation of environmental laws or directives. An example of this type of foot dragging has been the tortuous process of agreeing on a common directive regarding environmental impact assessment for the European Economic Community (EEC).[22] The perceived conflict between this environmental directive and policy makers' ability to make unlimited economic choices reportedly pitched environmental ministries against economic ministries within some EEC member countries, even when the adoption of the EEC directive would not have required any major changes in existing environmental laws or practices.

3. *Dominance of Conventional Economics*

Despite the crudeness of economic doctrines and tools as social welfare indicators, national decisionmaking continues to be dominated by conventional economics in both publicly and privately planned systems. In LDCs, national development planning is characterized by the indis-

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21. U.N. Comisión Economica para America Latina, El Medio Ambiente en America Latina, at 99, U.N. Doc. E/CEPAL/1018 (1976). Structural reasons for the relative ineffectiveness of national environmental law systems are discussed in J. Mayda, Forest Management and the Environment: Worldwide Trends in Legislation and Institutional Arrangements (1984) (paper, presented to International Conference on Forest Management and Environmental Protection, Madrid; accepted for publication in English by FOREST ECOLOGY AND MANAGEMENT: AN INTERNATIONAL JOURNAL.)

22. The history of the directive is discussed in L. K. CALDWELL, INTERNATIONAL ENVIRONMENTAL POLICY: EMERGENCE AND DIMENSIONS 118-21, 310 n.28 (1984); *Environmental Assessment*, 1984 J. PLAN. & ENV'T L. 845; Haigh, *The EEC Directive on Environmental Assessment of Development Projects*, 1983 J. PLAN. & ENV'T L. 585, 592-93.

criminate transfer of planning models from developed countries, even when the exercise is supposed to be indigenous and country-specific. A major recent example of the importation of inappropriate planning models into LDCs is the Lagos Plan of Action, a program for African development endorsed in 1980 by a summit of African Heads of State and Government in Lagos, Nigeria.[23] Commentators are just beginning to voice objections to this mode of constructing growth models.[24]

4. Outlook and Training of Lawyers

The typical outlook and training of lawyers affects the development of environmental laws in LDCs. Despite on-the-job training and the customary ability of experienced lawyers to serve as generalists with a capacity to manage and synthesize new facts, relatively few lawyers have been able to satisfactorily fulfill this role in the difficult field of environmental law. The reason for this seems to be that environmental law is particularly complex and involves the translation of scientific, technological, and social science concepts and information into public policy decisions and concrete laws. This professional challenge does not have historical precedent. In the 1960's, some commentators thought that the development of nuclear power would require a revolution in legal thinking to "build a legal-administrative framework broad, flexible and subtle enough to control nuclear activities with a sufficient margin of individual and societal safety."[25] Despite these early expectations, ecomanagement

23. ORGANIZATION OF AFRICAN UNITY, LAGOS PLAN OF ACTION FOR THE ECONOMIC DEVELOPMENT OF AFRICA 1980-2000 (1980).

24. *See, e.g.*, articles in such publications as DEVELOPMENT FORUM (Joint U.N. Information Comm. monthly) and MAZINGIRA: THE INTERNATIONAL JOURNAL FOR ENVIRONMENT AND DEVELOPMENT (published by Tycooly International Publishing, Dublin for the U.N. Environment Programme; "mazingira" is Swahili for "environment"). For a brief but representative argument from the "developed" world that western growth models should not serve as the primary conceptual framework for development, see Clinton, *The Never-To-Be-Developed Countries of Latin America: Growth Models of the Western World Cannot Be a Basis for the Concept of Development*, BULL. ATOMIC SCIENTISTS, Oct. 1977, at 19. The monthly vacancy list of the United Nations Technical Recruitment Services indicates that LDCs are increasingly requesting the services of macroeconomic advisers. Although this might appear to be a trend away from conventional economics and towards ecomanagement, macroeconomics is no closer to ecomanagement than microeconomics or other sectoral versions of economics.

25. Mayda, Book Review, 37 TUL. L. REV. 159, 159 (1962). *See also* ATOMIC ENERGY AND LAW: INTERAMERICAN SYMPOSIUM (J. Mayda ed. 1960). As it turned out, tort law, supplemented by government insurance, addressed many of the legal concerns about human safety in a nuclear world.

Even problems in patent and copyright law in this era of rapid advances in technology are comparatively straightforward. For the most part, the basic legal principles only need to be applied to the new forms of technology. The difficult decisions are in the area of policy, *e.g.*, whether or not to permit specific applications of a controversial new technology such as genetic engineering.

The need to integrate a field of law into a broad human system is not unprecedented. Consider, for example, modern penal law where the framework discipline, somewhat on the

stands out as a more challenging legal problem today.

On the national level, lack of understanding and communication between sectors hampers the legal process. For example, mission agencies (or their divisions oriented toward environmental protection rather than resource exploitation) typically initiate the formulation of "better laws," but a central legal office, such as the ministry of justice or the legal office of the presidency, must process the legal documents, legislative bills, regulations, or executive orders. Rather than cooperate with one another, these different government sectors sometimes appear to be at odds because the central office lawyers view environmental proposals as a low priority or, justifiably, do not feel competent to pass judgment on them.

On the international level, representatives of governments in the United Nations agencies or other major organizations that address environmental issues, although often styled "government experts," are in fact personnel from legal offices in their respective ministries of foreign affairs. They inevitably tend to see issues such as internationally shared natural resources or regional problems (such as acid rain) in their political or diplomatic perspective and not in a technical, environmental one. Indeed, their governments may have selected these representatives precisely because of that professional perspective.[26] Typically, when scientific, technical, or environmental law experts attend international meetings, at least some of the legal "experts" feel threatened and start insisting on the semantics of a resolution, rather than on technically correct content. To prevent this kind of situation, experienced presiding officers sometimes sacrifice the presentation of technical information by simply not giving the floor to authors of working papers or to other invited consultants.

In this state of uneasy coexistence between government representatives and the data generating and policy processing community, technical experts have at times themselves tried to draft legislation. There is more to good legal drafting than knowledge of substance and goals, however, and the results of drafting by technical experts can be described as mixed at best.[27]

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order of ecology, is etiology—the science of the origin and causes of diseases, in this case, social-criminal pathology. This approach contrasts with the view that penal law is merely a collection of responses to particular instances of delictual conduct, systematized only after the fact.

26. This pattern of staffing differs from other United Nations mission agencies. For example, the general background of delegates to U.N. Environment Programme (UNEP) meetings is conspicuously different from that of delegates to organizations like the World Health Organization, Food and Agriculture Organization, International Labor Organization, or the International Atomic Energy Agency. The latter organizations are typically represented by personnel from their national mission agencies, *i.e.* at least expert bureaucrats, while the delegates to UNEP meetings are primarily foreign affairs lawyers.

27. *See, e.g.*, W. BURHENNE & W. IRWIN, THE WORLD CHARTER FOR NATURE: A BACKGROUND PAPER (1983). [Ed. note: For further discussion of The World Charter for

Further communication problems are illustrated by literature intended to contribute to comparative law or lawmaking in LDCs. At best, these works are generalized statements growing out of specific sectoral missions or other experiences. Their empiricism and specificity restricts their transfer value.[28] There are, of course, important exceptions, but these tend to be limited by either their application to a specific jurisdiction[29] or by their publication in only one language.[30]

B. Problems Specific to Less Developed Countries

The following is an inventory of the parameters and constraints likely to influence ecomanagement in a hypothetical LDC—"Country X." These constraints on Country X represent the context in which environmental laws must be formulated and implemented in most LDCs. Of course, in real life, the presence of these factors and their relative importance will vary from country to country. By presenting these constraints as if they were all operative in a hypothetical LDC, this Perspective illustrates the potential difficulties and complexities any given LDC may face when it tries to create a viable system of ecomanagement.

1. Resources

a. Demography

In Country X, inflation typically erases any numerical growth of the economy, and industry and consumers deplete renewable and non-renewable economic resources. The only real growth is demographic and the population doubles almost every twenty years. The primary governmental task is to feed people, to provide their minimum energy needs, and to encourage growth in employment opportunities. There is neither a coherent national population policy[31] nor a consciousness of the problem at

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Nature, see the Article by Harold W. Wood, Jr. in this issue of the ECOLOGY LAW QUARTERLY.]

28. Some excellent articles in this category have been published in widely circulating journals. *See, e.g.*, Clark, *Water Legislation in Asia and the Far East: Proposed Guidelines for the Drafting of Water Codes*, WATER RESOURCES J., Mar. 1972, at 32; Trelease, *New Water Legislation: Drafting for Development, Efficient Allocation and Environmental Protection*, 12 LAND & WATER L. REV. 385 (1977). Even broad circulation, however, does not seem to translate into real world application. For example, following the publication of these particular pieces, the author crossed paths with a United States water resources management team in Central America and found that the relevant practical precepts from the articles were not being applied.

29. *See, e.g.*, M. DESPAX, DROIT DE L'ENVIRONMENT (1980).

30. *See, e.g.*, G. CANO, DERECHO, ADMINISTRACION Y POLITICA AMBIENTAL (1978).

31. *See, e.g.*, the elaborate Lagos Plan of 1980, *supra* note 23 and accompanying text, which makes only a tenuous reference to population at the very end of the document—by suggesting that member states of the Organization of African Unity, the sponsoring regional body, set up or strengthen their demographic statistics services—instead of starting with people as the most important development planning parameter. ORGANIZATION OF AFRICAN UNITY, *supra* note 23, §§ 348-354.

the citizen level. Whatever programs may exist to promote control of fertility depend on foreign donor organizations that must confront Country X's fundamentalist religious traditions.

b. Soil

Deforestation and poor practices in agriculture, grazing, and collection of firewood, have deteriorated the quality of the soil, shrinking the cultivable surface. Desertification, one of the major environmental trends in the world today,[32] also affects Country X.

c. Water

Watersheds and river basins are affected by many pressures, including the economic and population problems described above. At the local level, the problem of squatters and slash-and-burn cultivation on steep slopes compounds the lack of capacity and resources to practice systematic watershed management and protection. On the level of the national economy, logging and surface mining operations pollute major bodies of fresh water with organic and toxic effluents and silting. This affects municipal water supply, hydroelectric power generation, and facilities for recreation and tourism that could improve local income.

d. Nutrition

In Country X, many people suffer from chronic malnutrition, lack of potable water, and the consequent endemic diseases, as well as the natural disasters that are intensified—if not caused[33]—by the disturbed forest, soil, and coastal zone systems.

e. Development Planning

The development policy is guided by models transferred from the industrialized world rather than by the longer-term needs of the country as a whole. Factors such as the desire of developed countries to export

32. Desertification was the topic of a United Nations conference in Nairobi in 1981. This conference was one of a series dealing with major problems of the human environment initiated by the 1972 Stockholm Conference, *supra* note 5, and its findings have been repeatedly highlighted in the annual report of the State of the Environment by the Executive Director of the United Nations Environment Programme.

33. For a well-documented argument that many "natural" disasters are caused by environmental degradation, see A. WIJKMAN & L. TIMBERLAKE, NATURAL DISASTERS: ACTS OF GOD OR ACTS OF MAN? (1984). This report refers, among other things, to the rate of deforestation in the tropics (7.3 million hectares or 18 million acres per year), *id.* at 54, inundations in Bangladesh, *id.* at 53, 76, and the Sahel drought. *Id.* at 39-42. The report also points out that the frequency of natural disasters rose from a worldwide average of 54 in the 1960's to an average of 81 in the 1970's (an increase of approximately 50%). *Id.* at 23. During the same period, however, the number of victims affected by these disasters increased sixfold. *Id.* at 23. These figures suggest that disastrous degradation is taking place primarily in poorer countries where more people live under vulnerable conditions. *Id.* at 27-32.

technology and excess capital, and to have assured access to raw materials and commodities (concerns outside the direct scope of this Perspective) combined with notions of modernization, national prestige and the like (concepts extraneous to pragmatic planning) result in an emphasis on large physical development projects, benefiting mostly interests concentrated in the urban areas. Few resources—in the fields of health care, education and other public services and amenities—are left for small rural communities.

f. The Resulting Vicious Circles

As a result of the above five factors (a-e), the relationship between basic human needs and the productivity of the natural resource systems is locked in two vicious circles. One is "local-human." Poor nutrition, especially inadequate protein in early childhood, and a lack of basic education facilities contribute to a low level of literacy. This, in turn, frustrates efforts the government may make to alter destructive patterns of land use. The other circle is "national-economic." In addition to massive deforestation from commercial logging, forested land may also be cleared to convert it to pasture for sale to cattle ranchers.[34] The high protein product, ironically, is not for local consumption; it is exported to pay for the technology needed to implement national economic plans.

g. Urban Migration

The direct consequence in Country X of these various policies and factors is accelerated urban migration.[35] Liquid and solid waste and air pollution in cities increase exponentially, but municipal services are inadequate to solve the problems these pollutants create. The effects of protein deficiency on normal human development are further aggravated in large metropolitan areas by uncontrolled motor vehicle emissions such as carbon monoxide and lead. When foreign creditors impose domestic economic conditions, one of them is typically the reduction of food price subsidies. Urban migrants sometimes react violently to these restrictions (this recently happened in countries as diverse as Egypt and Brazil).

h. Foreign Aid

The use of foreign aid funds in Country X is often skewed, if not counterproductive, because of converging interests in technology export or import, industrialization "at all costs," and local image factors. Projects are funded without concern for coordination, mutual reinforce-

34. This destruction in Central America was recently estimated at 1,600 square miles per year. Nations & Komer, *Chewing Up the Jungle*, INT'L WILDLIFE, Sept.-Oct. 1984, at 14, 15.

35. For example, Mexico City has grown from a population of 10 million to over 16 million in 15 years. The United Nations projects a figure for Mexico City of up to 30 million in the next 20 years. São Paulo, Calcutta, and other cities are growing at comparable rates.

ment, or proper management of resource systems because no ecomanagement framework for encouraging this kind of judgment exists.

Technical assistance is uncoordinated. Several experts or even teams may be in the country at the same time—working on nutrition surveys, conducting urban planning, attempting to improve water resources, gathering and processing socioeconomic information, or drafting environmental legislation—but they are not likely to know about each other, at least not officially. The findings of such teams do not reach beyond the particular local agency, office, or sector, to which they are assigned. Local nongovernment resources, in particular universities and technological institutes, are not tied into the assistance process to supply information or to improve and train, through direct participation, local management and personnel. Technicians and professionals sent abroad under cooperative assistance programs to acquire advanced education, return—if they do—out of touch and intent on costly technological solutions unsuited to the problems, skills, employment needs, and economic constraints of Country X.

2. Legal and Institutional Framework

a. Existing Legislation

The existing environmental legislation in Country X is out of date or covers only a small portion of the contemporary problems in an uncoordinated fashion. National and regional officials are not familiar with comprehensive definitions of ecomanagement and might not see the need to coordinate related sectoral components.[36]

b. Implementation and Enforcement

There is a lack of personnel, budgetary resources, and motivation to implement and enforce existing legislation. To use a metaphor from ecology, the problems exceed the carrying capacity of the government. Additionally, public consciousness and discipline are not yet sufficient to force political leaders to correct even the most damaging abuses of the environment.

c. Lack of a Critical Mass

The various government departments that deal with human and environmental resources are concerned, or at least uneasy, about the envi-

36. Recently, the author found that sixteen categories of identifiable uses and abuses of an island state's coastal zone were "covered" by five pieces of mostly outdated legislation within the formal, although uncoordinated and mostly not exercised, jurisdiction of four government departments. A unified legal and administrative system of coastal-zone management was recommended, including three lead agencies (planning, tourism, national trust fund) and six sectoral mission agencies (agriculture/fisheries, coast guard, police, port authority, public health/sewage disposal, and public works).

ronment. Unfortunately, the conceptual model that permits a vision of how these concerns are interrelated is not widely understood and institutions are not adequately integrated, even when related sectors (*e.g.*, agriculture, forestry, or water resources) form part of the same ministry or directorate-general. Government units that should be working together on resource problems may be physically scattered in various buildings in the capital, distant from each other, or located throughout the country.

d. Legislative Initiative vs. Approval

The initiative for new or reformed environmental legislation comes typically from resource managers or technicians. The agency lawyer, if one exists, is a conventionally trained administrator—a narrow, rule-oriented technician—even though he or she may be willing to learn. Drafts of new legislation and regulations must go through the central legal department with this narrow perspective before they are submitted to the cabinet or the legislature. This agency review may be too internalized in the bureaucracy to permit effective lobbying by the authors. In Country X, legal talent is scarce and one lawyer may have to argue government cases, represent the country in international meetings, and review legal drafts submitted by environmental agencies. The court hearings and international conferences have pressing deadlines, leading the attorney to allow the environmental proposals to accumulate untouched.

e. Untapped or Uncoordinated Paths for Legislation

When a particular department or agency proposes a piece of environmental management or protection legislation,[37] several other agencies usually have jurisdiction over, effectively use, or administer the resources or systems involved. Agencies that typically exercise overlapping jurisdiction include those devoted to: public works, transportation, mining, energy sources and generation, agriculture, forest management, housing, rural, regional or river-basin development, education (including special technical education and retraining), and export or import trade. Some of these ministries are otherwise represented in the cabinet; others are autonomous public corporations.

None of the relevant overlapping agencies are typically involved in or even consulted when a related agency's legislation is prepared. Some of them may be simultaneously drafting legislation dealing with the same resource problem from a different perspective. For example, the ministry of health may be revising its public health code which involves the same areas of water quality, air quality, and waste disposal as the proposed

37. The expression "management or protection" is redundant and is used here only because it is common. Proper management *includes* protection. The terminology is a carryover from the period when the key terms were exploitation and conservation. These, too, are included and reconciled in ecomanagement.

environmental protection legislation, but from the narrower perspective of improving sanitary engineering. At the same time, a separate water and sewer authority may be looking at its own outdated standards, regulations, or rates, with reference to some foreign model proposed by an external consultant, but without coordinating with parallel local efforts toward environmental quality.

f. Diplomatic Problems Facing Technical Consultants

In Country X, technical assistance often comes very late—perhaps only after draft legislation is sent up through the political channels or otherwise publicized. These events tend to attract the attention of the local United Nations representative or a foreign development aid agency which then offers the services of a consultant. If a draft requires thorough revision and the consultant is conscientious, rather than merely accommodating, the late timing of the mission makes it difficult or at least awkward to propose serious reworking. Local drafters are not always willing to rewrite products their superiors have already seen or admit that their work needs more than cosmetic polishing.

Consultants may also run into protocol difficulties. For example, an advisory committee on the new legislation cannot meet unless all their members are available. Missing members may prevent committee meetings during a consultant's visit to Country X, thus preventing the consultant from adequately completing his or her job. At the other extreme, an agency that cannot otherwise obtain a hearing on its policy or legislative interest may be eager to have a visiting consultant briefed and documented, because the consultant's access to important government officials, although temporary, may exceed the agency's capabilities. This situation puts the consultant in a different, but equally awkward, position.[38]

g. No Centralized Structure

In Country X, there is no policy center in the government structure that can bring together fragments of authority, consolidate them into anything resembling ecomanagement, or promulgate the necessary policy guidelines under the highest central authority. (In fairness, it must be noted that this weakness of fragmentation is not limited to LDCs.) A planning agency may exist, presenting the appearance of a policy center, but it is constrained by its staff of conventional development economists. Their acquired professional perspective is too narrow to accommodate the complexity of real life problems and to arrange them in an analytic

38. A more detailed discussion of technical assistance is presented in UNEP, *supra* note 1, at 84-99. The optimal time for an external consultant to arrive is at the policy development stage of the intended legislation.

framework closer to the human ecosystem than to the gross national product or indicators derived from it. This reductionist vision of social management misleads decisionmakers as well as public opinion. Institutions of higher learning, which could in principle provide some counterbalance, are not integrated into the process of identifying national problems and needs, or responding to them on the level of advanced training, research, or application.

III

SYNTHESIS AND RECOMMENDATIONS

A. Summary of Environmental Legislation in LDCs

In contrast to complex and interdependent social and environmental realities and the long lead times needed to correct past planning defects, the typical LDC government, like that of Country X, is fragmented into sectors, which are themselves fragmented even further. Government is, at best, a crisis-solving mechanism. It lacks a systemic perspective, and each approach to individual critical issues is disconnected from the whole. Philosophically, as well as institutionally, governments focus on the legal system of rules, rather than continuous and coherent policy development which is the proper source of the interpretation, application, and ongoing adjustment of laws and institutions.

The predominance of economists and physical planners at the national level of planning also has important consequences. Development is frequently equated with the growth of economic indicators, not improvement of the overall quality of life. Preoccupation with econometric methods tends to push aside factors and concerns that are not easily quantifiable, *i.e.* concerns about environmental resources other than their exploitation. This emphasis on quantifiable economics has stymied the gathering and processing of other kinds of environmental data that could be useful for ecomanagement. Colorful urban master plans, available for every major metropolitan area in the world, tend to disguise the real problems of and opportunities for the betterment of human ecosystems.[39]

This planning and decisionmaking environment has predictable consequences. It emphasizes exploitation of resources, rather than management, which includes by definition the "best utilization." Monocultures and single-use practices, rather than integrated, multiple-use management prevail. Environmental problems are typically equated with pollution issues; short-term, remedial approaches, rather than a preventive outlook, illustrate the same reductionist mindset. Sectoral solutions prevail without regard to their cumulative or synergistic impacts (for example, requiring scrubbers when scrubbing out pollutants from gaseous

39. Analogous criticisms by a development planner are in A. WATERSON, DEVELOPMENT PLANNING: LESSONS OF EXPERIENCE (1979).

emmissions can cause groundwater problems more serious than the air pollution problem it diminishes). "Environmental economics" and narrowly based cost-benefit analysis are substituted for ecosystemic management (although techniques like the "polluter pays" principle[40] are a legitimate regulatory alternative when used selectively and in light of the evaluation of other alternatives).

These factors and trends are magnified by distinctions between "less" and "more" developed countries, rationalized by mechanical economic indicators instead of analysis and classification based on the various mixes of resources, problems, and opportunities of each particular country or region.[41]

B. Positive Precepts

The principal question this Perspective raises is whether environmental legislation in LDCs can make a difference and, if so, whether and how it can be brought about or reformed to represent a useful component in an LDC's program of human and environmental resource management. The propositions relevant to the answer can be summarized as follows.

Environmental legislation makes a difference. It establishes binding policies and standards, provides the basis for substantive and procedural regulations, and creates institutions at least theoretically capable of implementing policies and enforcing rules.

The lawmaking process is a catalytic function. The pre-legislation process can, or should, generate invaluable policy discussions on several ascending levels. First, it can encourage countries to inventory their problems and resources. Second, the lawmaking process should require the setting of priorities within sectors and among them. Third, it can work toward progressive coordination and integration of the several environmental resource sectors into ecomanagement systems. Lastly, it can blend the concerns of environmental management, the human environment, and national development planning.

The basic model of environmental lawmaking is common to all countries, despite great differences in their specific problems, national goals and priorities, government structures and ideologies, and personnel and other political resources.

The presence of a basic conceptual model does not, however, reduce the need for each lawmaking effort to start with a specific local information base, including information that ranges from ecological data to polit-

40. For an explanation of this principle, see ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, THE POLLUTER PAYS PRINCIPLE: DEFINITION, ANALYSIS, IMPLEMENTATION (1974).

41. IUCN'S TWELFTH TECHNICAL MEETING: PAPERS AND PROCEEDINGS 113-15 (IUCN Publications New Series No. 28, H. Elliot ed. 1972) (remarks by J. Mayda).

ical opportunities, customs, and constraints. Legislative "cookbooks" or "printed circuits" should not be prepared for easy mechanical application, and external legal and development models should not be automatically transferred without fine-tuning. These "prefabricated" approaches are too mechanistic and superficial; they are not anchored in the conception of environmental law as a component of ecomanagement, which is by definition specific to each country or jurisdiction.

Asking not only "how?" but also "why?" of environmental legislation is especially important in the area of international technical assistance. Professionals in this field must develop a conception and practice of technical assistance that is not limited to writing environmental laws for a given country. Most importantly, aid projects should try to leave behind, in each LDC, a growing residue of autonomous local skills. These skills should include a deeper understanding of the underlying structure and syntax of environmental law.

C. Building a System of Environmental Law

Even if there is no ready "recipe," there is a reasonably standardized "package" of components, steps, and sequences for the development of an effective system of environmental law. Every system requires at least five basic elements.[42]

1. Organic Legislation

An organic law is a framework piece of legislation of the "national environmental policy law" type. Its purpose is to establish: (i) an overall coherent policy, (ii) implementation procedures (in particular, environmental impact assessment), and (iii) a central organ for policy development and monitoring. If a body of environmental legislation already exists, it should be integrated into an organic law. If not much legislation has been developed, an organic law should be prepared independently.

2. Sectoral Legislation

Existing sectoral laws should be revised in the light of the overall policies established in the organic legislation, or otherwise enunciated. New legislation should be prepared to cover all the principal resources (*e.g.*, water, forests, minerals) to be managed.

3. Early Implementation

New laws often remain on the books untouched because implementing regulations are delayed by several years or, in the worst case, never

42. For an extensive discussion of the structure, design, and implementation of organic environmental legislation, see UNEP, *supra* note 1, at 34-83.

issued. The drafting of regulations, including institutional adjustments required by a new law, must be conceived as a continuation of the drafting of the law itself. The first draft of a regulation should be prepared while the law is going through the process of formal adoption and promulgation.

4. Realistic Simplicity

Laws, as well as the institutions and procedures they establish, should be implementable, *i.e.* simple and tailored to each nation's needs and existing capabilities. For example, if standards are set so that monitoring requires overly complicated and costly equipment, they and their parent law will not be implemented. Technically complicated statutes may, in fact, be a calculated ploy to avoid effective environmental regulation; there can be little doubt that this tactic has been used in some cases. More frequently, however, complex laws represents an infatuation with technological gadgetry rather than the more realistic principle that the simplest "adequate" technology is probably the best.

5. People Make the Difference

The best designed environmental legislation cannot achieve anything without sufficient numbers of trained and reasonably compensated personnel at various levels of implementation, management, and administration. Every legislative program should include some plan to ensure that adequate personnel will be hired and trained.

6. The Complete System

Environmental law operates in a corner, if not in a vacuum, unless and until it becomes part of a progressive integration of economic planning and ecomanagement functions. This integration normally requires some or all of the following steps: (i) regular input from environmental-resource sectors into the development planning and budgeting process; (ii) gradual policy streamlining and rapprochement between "environmental" and "development" communities; and (iii) an eventual institutional merger of economic development and ecomanagement systems. This integration and reform requires a degree of consciousness and willingness on the part of development planners, as well as their political superiors, that has not typically been demonstrated so far in LDCs.

D. Environmental Impact Assessment: The Double Lever

Progress toward these goals, in particular the improved "reasoning together" of the environment managers and the development planners, can be effectively fomented on two levels. Policy analysis from various sectors can be integrated at the local level by the implementation and

practice of effective environmental impact assessment, with the assistance of international organizations[43] and bilateral technical assistance agencies. On the international level, this integration can be encouraged by lending and donor agencies that insist on competent environmental impact assessments to demonstrate the environmental feasibility of projects as a precondition for funding.

To be effective, environmental impact assessment should not be more complicated, extensive, or expensive than the action and suspected socio-environmental impacts require. But it should always have several minimum characteristics. The analysis should: (i) be based on all relevant data and permissible estimates; (ii) start in the early stages of the project (action, program, law making) design; (iii) result in an integrated cost-benefit analysis; (iv) and provide, where indicated, a choice of alternatives, noting the different balances of environmental benefits and costs.

Figure 2 schematizes a typical integrated project design and impact assessment sequence.[44] This design sequence presents in greater detail the steps involved in environmental impact assessment. It may serve as a model for those attempting to construct concrete impact assessment guidelines. The model also illustrates the proposition stated earlier in the text that environmental impact assessment is properly an exercise in specific policy development. Consistent assessment practices encourage the progressive integration of "the environment" and "development," and should be recognized as a new, superior development planning tool.

E. The Role of External Cooperation and Assistance

External technical assistance is indispensable and is, in fact, an integral part of the ecomanagement "package" in LDCs. It needs considerable review, however, to become an effective agent for the advancement of ecomanagement, including its legislative component. A progressive revision should have several facets:

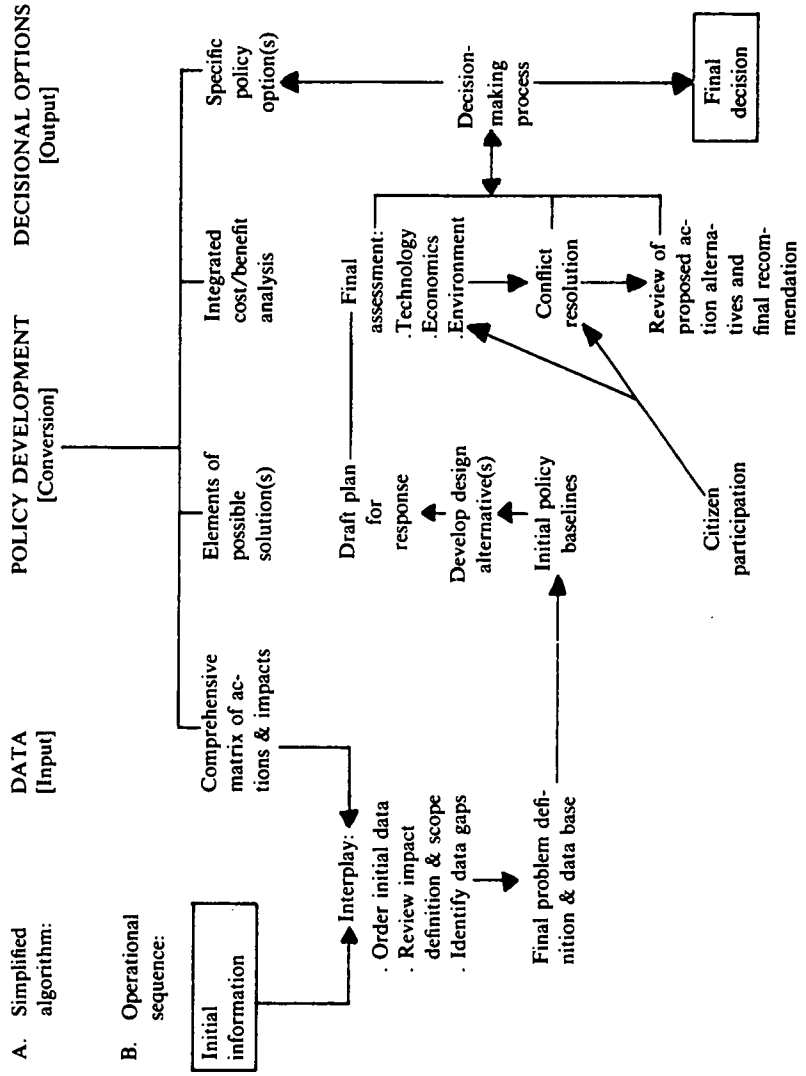
(i) Technical assistance must consistently represent the state of the art. This has not thus far been typical in law or in environmental impact assessment primarily because neither is normally conceived in the whole ecomanagement perspective. In particular, the production of environmental impact assessment guidelines has become almost a growth cottage industry. The apparent satisfaction of authors with their product is not

43. *See supra* note 18 and accompanying text.

44. Figure 2 was originally prepared as part of a working paper on "Air Quality Management Policies: An Approach Methodology and Model for Assessment," presented at the Conference on Air Quality Management and Energy Policies, Baroda and Bombay, February 1981 (organized by the Department of Environment of India, School of Environmental Sciences, J. Nehru University, New Delhi, and Environmental Policy Institute, East-West Center, Honolulu). It was refined for colloquia at the Federal Office of Environment, Berlin, and the Center for Formation in Environmental Sciences, Madrid, in 1983. It has been further revised for inclusion here.

Figure 2

Integrated Project Design and Impact Assessment Sequence



matched, however, by rigor and clarity in concepts, terminology, and method.[45] Particularly lacking in most of this literature is the understanding of such key aspects of environmental impact assessment as the working ratio between the quantity and mix of data; the role of informed intuition; and the ultimate real need and task—to optimize decisionmaking even under conditions of severe uncertainty. This decisional environment is not peculiar to LDCs, but is particularly important to them because they have narrower margins for error.

(ii) The philosophy and execution of technical assistance need to be adjusted to intensify the interaction between the mission and the client country. Whether the target is comprehensive legislation or some lesser assistance, the ultimate forces in play—in particular the will and capacity to implement—are political. This important relationship is best cultivated if the initiative toward concrete actions is local and if it takes place, as much as feasible, within existing institutional structures and traditions.

The corresponding formula for success, from the perspective of both the LDC and the assistance agency, is to start with the existing means. Outside consultants should first find out what the responsible internal officials have in mind and how they think it can best be carried out within the existing political institutional framework. Then, an effective wedding of the best conceptual model and the concrete local circumstances can be offered.

(iii) Assistance missions must be "debureaucratized." In particular, the goal and measure of success must be more than a report, no matter how elaborate or packaged. Reform requires that consultants make a conscious effort to establish working contacts well beyond the desk and typewriter provided by the host agency—in related offices or sectors, outside the executive government proper, and in institutions of higher learning. This outreach is a proper part of the postulated comprehensive framework; it may be a more important long-term achievement than the specific, limited mission report. Developing this kind of a network during the mission facilitates follow-up, on an official and personal level.

International and bilateral technical aid, donor, and lending agencies hold the key to the practical development and institutionalization of such improvement in technical assistance. These agencies need to build an ecomanagement conception into their planning, decisionmaking, and selection and training of their officials and consultants. This commit-

45. Two outstanding recent examples are J. Horberry, Status and Application of Environmental Impact Assessment for Development (1984) (paper prepared for DSE/UNEP International Seminar on Environmental Impact Assessment for Development) and ENVIRONMENT CANADA, REVIEW AND EVALUATION OF ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT (1983).

ment will take much more than formal declarations of intention.[46]

CONCLUSION

Environmental legislation can help solve environmental problems in less developed countries. To be effective, however, it must be perceived as part of a larger process of ecomanagement. Ecomanagement is management of the human environment according to ecological principles. To facilitate ecomanagement, environmental laws should attempt to coordinate currently fragmented sectors and policies relating to resource management so that local, regional, and national development decisions can be evaluated in terms of their environmental impacts. Environmental impact assessment is an ideal vehicle for concrete environmental decisionmaking.

The environmental laws of each nation must be tailored to the particular parameters and constraints operative in that jurisdiction. Most nations need to address and overcome implementation problems, resistance to environmental legislation from economic policy makers, the limited paradigm of conventional economics, and communication problems between law makers and other professionals whose knowledge is needed for the legislative process.

In addition to the above constraints, less developed countries face numerous indigenous limitations that should be factored into the design of their legislation. A typical LDC has relatively severe environmental problems, limited economic, institutional, and educational resources, and a fragmented governmental approach to resource management. Instead of having an ecomanagement perspective, most LDCs incorrectly focus on western growth models that have been indiscriminately transferred to LDCs, often with little success, and usually without regard for their environmental consequences.

To overcome these problems, environmental legislation in LDCs should be comprehensive enough to permit a unified approach to environmental problems, yet simple enough to allow implementation with limited resources. Legislators should consciously seek to coordinate the various sectors that currently focus on discrete segments of larger envi-

46. *See, e.g.*, the Declaration of Environmental Policies and Procedures Relating to Economic Development signed at United Nations Headquarters on February 1, 1980 by the World Bank, five regional development banks, the European Development Fund, the Organization of American States, United Nations Development Programme and United Nations Environment Programme. *Development Agencies Sign Declaration on Environmental Policies*, UN MONTHLY CHRON., April 1980, at 39. Only the World Bank has prepared, since 1974, general and sectoral guidelines for environmental impact assessment. [Ed. note: *See* the Article by Bruce M. Rich in this issue of ECOLOGY LAW QUARTERLY, note 148 and accompanying text.] For all their practical value, even these do not reach the level of conceptual integration this author considers necessary.

ronmental problems, and, above all, they should try to integrate environmental policies with economic development planning.

External technical assistance needs to become an integral component of ecomanagement in less developed countries. Specifically, aid missions should provide state-of-the-art information, tailored to the needs and capabilities of the recipient nation, in a manner that builds the recipient nation's ability to solve its own environmental problems.