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ELEMENTS FOR AN EFFECTIVE ENVIRONMENTAL POLICY

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## INTRODUCTION

The deterioration of the quality of the environment which has occurred over the past few decades is now one of the major concerns of contemporary society.

This is not to say, however, that environmental damage is a new phenomenon. What makes it of greater concern today is that the planet's population is now larger than ever before and is exerting pressure in various directions as people seek space, food, raw materials and energy. The earth's inhabitants also need to make the fullest possible use of the environment's capacity to break down the wastes they produce. At the same time, mankind has now acquired enough scientific knowledge, technology, and material and financial resources to give it an enormous capability to transform the physical environment and, indeed, to destroy it intentionally.

The mobilization of public opinion regarding these issues has been prompted by major changes in the nature and severity of environmental problems, which are now causing an alarming deterioration in the quality of life and seriously jeopardizing the living standards of coming generations. If current trends associated with the expansion of man's activities are not reversed, the alteration of ecological balances which is already beginning to hamper the development process will soon take on dramatic proportions. Ensuring the environmental sustainability of the vast array of efforts being made to raise living standards is therefore a task of the utmost importance.

Despite the widespread existence of an awareness of the hazards of environmental degradation, most countries are having great difficulty in taking effective action to resolve these problems and to reverse prevailing trends in this connection.

Thus, even though economic theory is concerned with the allocation of scarce resources to satisfy a large variety of needs, it has thus far generated very few studies of the type which could provide the authorities with guidance concerning the use of environmental goods and services. This lack is particularly striking in respect of public goods and services to which no price is assigned, for which no market exists or whose prices do not fully reflect their importance or scarcity from the standpoint of the ecological balances that play a crucial role in the preservation of mankind's environmental heritage.

The fact that economic theory and praxis have paid little attention to the environmental sustainability of economic growth is evidenced by the main indicator used to measure a country's economic performance, i.e., national income. Environmental sustainability should be one of the pivotal elements in the definition of this indicator,<sup>1/</sup> but the methods used for its calculation do not provide information as to how a society is preserving or using up its natural resource base of matter, energy and information. Consequently, this indicator does not serve as a guide for a rational form of decision-making which would minimize the costs associated with society's use of this resource endowment.<sup>2/</sup>

However, although efforts need to be made to refine the information to be used as a basis for decision-making, it should not be forgotten that the development of suitable indicators will not automatically lead to the solution of the problems at hand. Instead, this depends to a much greater extent on whether or not national authorities make a firm commitment to an environmental policy and, more specifically, to concrete environmental objectives. What is more, many of today's environmental problems are so glaringly evident that no great quantity of complicated information is needed to identify them, and postponing action until such information becomes available could well occasion an inexcusable delay.

Generally speaking, Latin American and Caribbean governments have very little experience and a quite unsuccessful record as regards the two-fold task of ensuring the environmental sustainability of economic activities while generating income from them. The fact that some countries in the region have formulated explicit environmental policies and have even backed them up with special legislation has not, however, guaranteed their effectiveness. In others the situation is even worse, since the proposals made by government authorities have thus far not advanced beyond the point of token acknowledgements.

It is often asserted that the ineffectualness of one or another country in dealing with environmental issues is the result of a lack of genuine political will to confront these problems on the part of the authorities. There is more than a grain of truth to this contention. However, it is also true that even if the authorities were to decide to throw the whole of their weight behind efforts to resolve these problems, they would nonetheless encounter considerable difficulties owing to the lack of suitable tools for implementing their policy decisions.

The following pages will be devoted to an exploration of implementational capabilities in respect of environmental policy as a decisive factor in the effectiveness of such policies. The consideration of this question will begin with an examination of the concept and meaning of environmental policy as such.

## I. THE CONCEPT AND SCOPE OF ENVIRONMENTAL POLICY

The environmental policy of any given country may be defined as a set of decisions taken by the authorities with the object of setting limits on and, to some extent, directing the behaviour of people, businesses and the various divisions of the government itself in so far as it relates to the use, management and conservation of natural resources and of the environmental services available to the society concerned.

For the purposes of this discussion, however, it is also necessary to recognize the existence, in all countries, of what could be called an "implicit environmental policy".

### 1. The environmental policy implicit in economic policy

It would be difficult to point to any sphere of economic policy which does not have some sort of significant effect on the environment, and this is especially true in countries whose economies are heavily reliant on the exploitation of renewable or non-renewable natural resources. Hence, as a rule, any economic policy may be said to contain an implicit environmental policy.

The potential effectiveness of an environmental policy which has been explicitly defined in the sense discussed at the start of this chapter may be substantially diminished if the existence of this implicit policy goes unrecognized, and the effectiveness of the explicit environmental policy will be reduced even more severely if, as is often the case, the content of the implicit policy runs counter to many of its components. It should be noted in this connection that a country's implicit environmental policy usually has an impact both on the intensity of resource use and on the way in which such resources are managed. Thus, such implicit policies have often resulted in the overuse, in the underrating and underutilization or, simply, in the misuse of natural resources in the region.

Numerous examples can be cited to back up this statement. The aggressive export promotion policy pursued by Chile in recent years has permitted the country to expand its fishery industry to the point where it was the fourth largest in the world in 1989, as well as making Chile the largest exporter of fish meal in the world and

the source of 54% of the world's supply of dried algae. Catches soared at the extraordinary average annual rate of 12.2% between 1974 and 1989. In this case, the implicit policy on the management of hydrobiological resources has been one of refraining from placing restrictions on access to such resources, with the exception of such limitations as might be dictated by considerations relating to a product's marketability. As a result, according to preliminary estimates, the capacity of that part of the fishing industry which is geared to the exploitation of pelagic fishing grounds is such that its potential catch is currently six or seven times greater than the maximum catch that the natural resource base of those fishing grounds can sustain.<sup>3/</sup> It should be noted here that the country has not had an explicit environmental policy on the protection and conservation of hydrobiological resources.

A similar example is provided by what occurred in Ecuador with respect to the harvesting of shrimp for export during the past decade.

## 2. Environmental policy objectives

In addition to a recognition of the "environmental policy" implicit in a country's economic policy, the formulation of a realistic policy on environmental matters and the development of appropriate policy tools requires, as in the case of any other type of policy, a suitable definition and ranking of its objectives. This is more complicated than it might seem at first glance, and it is therefore worth taking a moment to consider this subject further. On the one hand, man's knowledge about the nature and scope of environmental problems is far from complete, and there is no consensus on this score. On the other hand, the ranking of these problems and the priority assigned to their solution cannot readily be geared to objective criteria and scientific principles.

A hallmark of land-based, marine, atmospheric and biological ecosystems is that they function systemically; in other words, they are not compartmentalized. Indeed, all ecosystems, along with all their various components, are closely interrelated. Hence, no sooner is a list of environmental problems drawn up than one begins to discover relationships of causality or simultaneity among many of the problems it contains. For example, the deforestation occasioned by the burning of woodlands leads to a decrease in the wildlife populations in the affected area, to the loss of protective ground cover in river basins --along with the resultant silting of reservoirs and water courses-- and to air pollution caused by carbon dioxide emissions and suspended particles as well as by the reduction of photosynthesis and, ultimately, of the environment's air-purification capacity. Needless to say, if this process continues, the land-based ecosystem will eventually become subject to increased erosion and desertification.

The systemic character of the environment has important implications for the implementation of an environmental policy. For instance, it frequently proves to be the case that in order to resolve one environmental problem, another problem, which is the cause of the former, must be dealt with first. Furthermore, the solution of a given problem may have undesirable side effects. It often happens that if, for example, steps are taken to reduce water pollution by banning the dumping of certain liquids into the waterways, these wastes are then converted into solids which are disposed of in an equally harmful manner or are incinerated. This phenomenon, which is sometimes referred to as the "migration" of pollution, was overlooked when some of the first environmental laws (which were, moreover, strictly sectoral in nature) were being drafted in the industrialized countries. In short, this legislation addressed the problems of water, soil and air pollution separately rather than as interdependent phenomena. Today, however, many of these countries have adopted a systemic approach to these issues which, although certainly more complex, permits them to avoid many of the mistakes committed in the past.

In many cases, the systemic nature of the environment also makes it particularly difficult to identify relationships of cause and effect, not only because of the interdependence of environmental phenomena but also because the spatial and temporal patterns of this interdependence are extremely complex. A given phenomenon may occur in one place but have an effect on distant ecosystems, or a cause and its effect may occur in the same location but at different times. Because of the intricacy of the environment, environmental policy-makers must draw upon a very wide range of specialized knowledge in order to arrive at valid analyses and projections. By way of example, it may be noted that some of the models formulated in developed countries to deal with cases of water pollution have been based on an array of climatic, topographic and hydrological information as well as specialized dispersion studies.<sup>4/</sup> There is still a great deal of theoretical work to be done in this area, however, and it should therefore be one of the focuses of environmental policy efforts.

Apart from the need for accurate analyses, because of the enormous variety and complexity of environmental problems it is imperative that policy-makers prioritize their objectives when they reach the stage of defining the actual content of an environmental policy. It is better if the first attempts at environmental management focus on a few clearly-defined objectives, since the experience gained in the course of their achievement will gradually strengthen a country's programme and project formulation and execution capabilities. An attempt to implement a comprehensive policy (i.e., one which addresses all the issues simultaneously) from the very start may well give rise to unrealistic expectations.

In Latin America, the initial enthusiasm which led to the creation of a number of ministerial offices to deal with

environmental issues (environmental departments, bureaus and units in ministries of natural resources, energy and mines, industry, health, public works, agriculture, etc.) caused the authorities to lose sight of the necessity of taking a gradual approach to the application of such complex policies within an institutional structure which, moreover, was lacking in the necessary experience and plagued by innumerable constraints. In many cases this led to the division of efforts and of scarce resources among a large number of spheres, each of which had its own very different requirements in terms of planning, execution, monitoring, research, training, dissemination and community participation. Although they provided valuable experience, many of these initiatives were unsuccessful precisely because efforts were spread too thinly.

### 3. The differing environmental views and interests of the various social agents

Above and beyond the importance of carrying out scientific studies to identify environmental problems and evaluate their seriousness, the task of setting clearly-defined environmental policy objectives, within a specified time span, involves other equally complex but very different elements which have an enormous influence on the selection and application of the corresponding policy tools. We are referring, specifically, to the interplay of the different environmental and non-environmental interests of the various sectors of society and to how this interplay of interests influences the setting of priorities and the selection of the actual modalities of environmental action.

Different social actors inhabit different ecosystems and microsystems, belong to different socioeconomic strata, have different educational backgrounds in terms of both years of schooling and the quality of instruction and, as a function of their particular field of economic activity, have different interests as well. Thus, the importance which they assign to environmental issues within the context of their overall needs may also differ enormously. By the same token, the relative importance which the various groups assign to a specific environmental problem and their assessment of its urgency may also be very different. It should also be noted that the weight assigned by the various agents of society to each specific problem may not necessarily correspond to the weight which an objective, scientifically-based assessment of the situation would assign to those same problems.

The differing views of the various social groups as to which environmental problems need to be addressed is not, however, the only source of conflict with respect to the establishment of an environmental policy. Another such source is that the desire to achieve certain objectives is not always matched by a willingness on the part of these groups to bear the costs of doing so. On the whole, it has proved quite difficult to persuade the various agents



to shoulder the burden of absorbing external environmental diseconomies and to elicit a genuine willingness to pay for a healthful environment.5/

One of the reasons for this difficulty is that there is no definite dividing line between the agents that cause environmental degradation and the agents that are affected by it. Indeed, the causative agent is frequently also the one affected by a given problem. Motorists are the best example of such a situation. In other instances, the causative agent may not be directly affected by the environmental damage it produces but instead by the damage caused by other agents. For example, an industrial plant may be polluting a river, thereby harming the population living downriver from it, while at the same time suffering from the environmental impacts caused by other agents, such as damage to the plant occasioned by periodic flooding resulting from the deforestation of the upper reaches of the river basin.

The legitimacy of environmental policies is therefore of crucial importance. The authorities responsible for designing and implementing such policies must have a very clear idea of which agents are involved, the extent to which those agents' views are alike or differ, the available scientific evidence, their particular rationales, and the way in which those agents will defend and exert pressure on behalf of their interests. The authorities must have a solid understanding of these factors in order to discern what types of actions, measures and tools will be effective in carrying out the environmental management process to be undertaken.

## II. IMPLEMENTATIONAL CAPABILITIES: REQUIREMENTS FOR AN OPERATIVE ENVIRONMENTAL POLICY

One of the reasons for the relative unsuccessfulness of the environmental policies instituted in the region is, as mentioned at the outset of this discussion, the lack of sufficient and appropriate tools for their implementation or, in other words, the absence of means by which to make them operative.

The following issues merit analysis in this connection: the necessity of implementing a multisectoral, spatial approach to environmental policy; the importance of the role played by economic policy tools in environmental management; the need to make a careful selection of specifically environmental tools for the execution of an environmental policy; the special function performed by environmental impact assessments in establishing environmental policy linkages; and the need to establish clearly-defined financing mechanisms in order to ensure the policy's implementation.

### 1. A multisectoral, spatial approach to environmental policy

It is essential that a multisectoral approach be taken to the implementation of an environmental policy due to the systemic character of the environment and the diversity of the social actors concerned, as discussed earlier. This requirement may be broken down into two specific components. Firstly, the need to ensure, along with the compatibility required by the interdependence of productive and technological activities, the compatibility of the sectoral policies contained within the overall environmental policy, based on the interconnections and limitations of the corresponding biological, geographical and physical systems. The effort made to achieve intersectoral compatibility should, at the same time, ensure the uniformity of the basic criteria of environmental protection, conservation and upgrading which are to be employed, as well as establishing the co-responsibility of the various agents and institutions as regards environmental policy implementation and follow-up.

Secondly, the overall environmental policy's objectives, programmes and tools must be clearly and explicitly expressed in the development policies of each of the various sectors involved

in the overall effort. There is virtually no environmental problem or goal which does not involve agents from a number of different sectors of economic activity, whether as the originators of changes in the environment, as users of environmental services or as the parties affected by given problems.

In order to illustrate this point, we may use the example of a river which provides water for crop irrigation and drinking water for nearby human settlements, serves as a disposal site for the domestic and industrial wastes produced by those settlements, performs aesthetic and recreational functions, supplies water for industrial activities, permits the generation of electricity, furnishes a habitat for the hydrobiological resources harvested by fisheries, and serves as a transport route, all at the same time.

An environmental policy designed to protect and conserve this water resource in its entirety ought, in this case, to lay down clear-cut guidelines for the behaviour of agents in the agricultural sector, the sanitation services subsector, the industrial sector, the tourism industry, the energy sector, the fishery industry and the transport sector. Responsibility for the specific design, implementation and follow-up of the sectoral components of the overall environmental policy should be assigned to the institutions in charge of the development of each of these sectors. The co-ordination and integration of all these components should be carried out by the authority responsible for the overall environmental policy on a trans-sectoral basis. The effectiveness of the policy as a whole will depend to a great extent on whether or not the persons and institutions responsible for its implementation and follow-up have tools at their disposal which are suited to this set of circumstances.

The explicit definition of spatial or territorial factors is another element which has a direct bearing on the chances of successfully implementing an environmental policy. Indeed, the chances of success are virtually nil if such a policy is designed without reference to the spatial organization of human settlements and production activities in the area in question. There are two basic requirements in this connection. Firstly, from an overall standpoint, it is necessary to incorporate a policy governing the use, management and exploitation of natural resources and environmental services into the regional development policies of the country in question. This means that the enormous diversity of the different regions within a country as regards natural resources and environmental conditions must be recognized but, as a corollary to this, it also means that the regional specificity which should characterize environmental policies on resource use and management must be recognized as well. Thus, the overall environmental policy should contain a series of regional environmental policies.

Secondly, from an intraregional and local standpoint, environmental factors that have a bearing on development programmes

and projects must be expressed in highly specific spatial terms or, to put it another way, the spatial coverage of the corresponding environmental policies must be clearly delimited.

To return to the example of the river given above, an environmental policy which sets forth restrictions on the use of the river (or, more specifically, on the use of its capacity to break down organic wastes) as a resource of industrial activity in purely generic or non-spatial terms provides no real guidelines that could be followed or implemented effectively, since, from a spatial perspective, the river's capacity to break down wastes takes on an entirely different value at a location upriver from an urban centre or an area of aesthetic beauty than it does at a location downriver from that same centre or area. On the other hand, this type of regulatory policy tool can be effective if the spatial boundaries of its application are clearly indicated.

## 2. The use of economic policy tools

Recognizing the existence of the environmental policy implicit in a country's economic policy brings to light a number of operational requirements. It is worthwhile analysing at least two of those requirements here.

Firstly, an environmental policy should be such as to ensure that when comprehensive and, especially, sectoral economic policies are being formulated, the possible medium- and long-term environmental impacts of their application will be evaluated. In other words, it is important to make explicit the environmental component of economic policies so that they can be corrected if their adverse effects would be severe enough to jeopardize the achievement of those same policies' major objectives. By the same token, this process will permit environmental policy-makers to devise compensatory steps or measures and to define and apply them in time to prevent or mitigate the undesirable effects of the production activities in question.

The second requirement has to do with the need for environmental policies to make a much greater use, for a variety of purposes, of tools that are usually regarded as falling within the realm of economic policy, in parallel with the continued refinement of direct regulatory mechanisms specifically designed for environmental purposes, which will be discussed below.

The use of economic policy tools for such purposes involves the utilization of indirect incentives or disincentives, especially those of a fiscal nature. Some tools that may be used as incentives are, for example, subsidies or tax exemptions to encourage the use of new technologies, the proper siting of given activities, the use of certain inputs and other similar courses of action which are

particularly beneficial or which at least minimize specific adverse environmental impacts while not hampering the activity concerned.

Examples of tools that can act as disincentives include the levying of special taxes, land tax surcharges, increases in the rates or charges for public services, etc. Although it may be more difficult to accomplish than with the use of incentives, the purpose of such disincentives is not to hinder the activity in question but rather to increase the attractiveness of given locations, production methods or alternative technologies which are less harmful to the environment than those that are being discouraged.

Credit measures based on the above criteria can also play an important role. In this case, incentives or disincentives would take the form of interest rates, grace and repayment periods, the requirement of guarantees and endorsements or the lack thereof, the provision of technical assistance, etc.

The use of economic policy tools for such ends is based on the assumption that they can be employed to elicit a certain reaction from socioeconomic agents, i.e., their reactions can be predicted. Thus, these tools should be applied for the purpose of inducing such agents to behave in a way which will permit at least some progress to be made towards the target level of environmental quality. This target should, in its turn, be set on the basis of standards defined in terms of selected environmental indicators.

The example of fishery resources cited earlier --which, as the reader will recall, referred to the imbalance between the fishery industry's harvesting capacity and what would be an environmentally sustainable catch-- will serve to illustrate the suggested course of action for ensuring the effective implementation of an environmental policy. In such a case, it is clear that any policy applied in an attempt to deal with the problem of the eventual depletion of certain species due to overfishing should also provide a means of solving the economic problem posed by overinvestment in this subsector. Otherwise, the policy will be virtually inoperative. One possibility which could be explored within the context of the proposed approach is the establishment of lines of credit or tax incentives to promote deep-sea fishing in such a way as to facilitate the conversion of the surplus portion of the fleet to that type of fishing.<sup>6/</sup> At the same time, this would also enable the sector to maintain or increase its exports, whereas an environmental policy that did not address the economic repercussions of its application would fail to take this objective into account.

Essentially, the aim of using economic policy tools for purposes of environmental management as described above is to foster greater economic efficiency within the framework of a sustainable allocation of the natural resource base. It should not

be forgotten, however, that some of these tools may also be used simply as a means of obtaining financing for direct government programmes and activities aimed at achieving specific objectives of environmental rehabilitation, reclamation or the mitigation of adverse environmental impacts, or for defraying the cost of enforcing environmental quality standards established as part of the policy.

The selection of a specific tool and the precise definition of the extent to which it is to be applied will depend on which of the above-mentioned aims is being pursued. The experiences of a number of countries outside the region in the area of pollution control, which have been analysed in a recent OECD publication,<sup>7/</sup> are of interest in this regard.

One of the conclusions reached on the basis of the OECD study of 14 countries, six of which were analysed in depth,<sup>8/</sup> is that, with the sole exception of experimentation with the creation of emissions rights markets in the United States, the use of this type of instrument has rarely had economic efficiency as its objective. With respect to the utilization of fees or taxes as policy tools, it is argued that in order to use them for the purpose of achieving greater efficiency, they would have to be much higher than those actually charged, which would appear to be unfeasible. Thus, this type of instrument (fees or taxes) has been employed primarily for the purpose of obtaining revenue, and it is foreseen that this will continue to be a major consideration in the future. As regards the question of the agents discussed earlier, Europe's experiences in this connection are particularly instructive.

Another conclusion which is of interest, since it refers to the types of instruments dealt with in the following section, is that almost all the economic tools which have been applied have been used as complementary measures in conjunction with direct regulatory instruments.

### 3. Direct regulatory tools

Although it should not be forgotten that there are many useful instruments of environmental education and sensitization and that fiscal expenditure can also be used as a instrument of direct action, this section will concern only those tools which have to do with the regulation of the behaviour of economic and social agents.

These instruments seek to bring about a certain type of behaviour on the part of such agents by directly specifying what they should or should not do with respect to a resource or an environmental condition, and a penalty is usually imposed upon agents that fail to comply with these specifications. Without attempting to provide an exhaustive list, some of the instruments

of this type which have been applied to a greater or lesser degree in the region are discussed below.

a) Firstly, there are instruments which seek to ban or place quantitative restrictions on the use of a specific resource or environmental system. A serious limitation associated with these tools, which are of a purely negative character, is that they do not define the specific ways in which an appropriate use might be made of the resource or ecosystem in question within the bounds of the restrictions they establish.

Instruments of this sort include the various types of quotas (on fishing, hunting, mining, exports, etc.); rights and concessions (awarded on the basis of competitive bidding or without charge) in regard to a given resource or ecosystem; closed seasons (a permanent or temporary ban on the extraction or exploitation of a given resource or species); and use or exploitation restrictions or prohibitions (such measures are generally associated with a specific ecosystem, as in the case of the establishment of a wilderness area or a forest reserve).

b) Secondly, there is a group of measures having a broader scope than the first which seek to exercise a more qualitative form of control over actions that alter the environment by requiring that specified forms of management be undertaken in conjunction with the use or exploitation of the resources or environmental systems which are directly or indirectly affected by such actions. In general, this group includes all those types of zoning which, although they may be based on different criteria, clearly emphasize the protection or preservation of given environmental conditions; the installation and operating permits required for certain activities which are contingent upon compliance with a fairly broad range of environmental guidelines; and permits for the use or exploitation of given resources or environmental systems which are subject to the prior approval of resource management plans.

The measures belonging to one or the other of these two categories are not mutually exclusive; in fact, they are often used in combination with each other, as, for example, in the case of regulatory urban development plans in which zoning is used in conjunction with the issuance of permits for the establishment of certain activities. Another example is the issuance of permits for the installation of industries in a given location on the condition that the volume of industrial effluents or wastes is kept below a certain limit; such permits may or may not be linked to a prior zoning provision. Another example of the combined application of the two types of instruments is that of fishing permits whose issuance is subject both to the use of certain equipment and to the condition that the catch be confined to certain ages or sizes of the species concerned. Another measure that falls into this category is that of permits for the logging of natural forests

whose issuance is contingent upon the implementation of a specified form of forest management.

As noted above, almost all of these instruments have been applied to some degree in the region. However, in most cases the purposes for which they have been used have been defined on a purely sectoral basis. In other words, due consideration has not been given to their proper integration into an explicit environmental policy or their compatibility with such a policy.

Besides giving rise to behaviour whose side effects may counteract or even negate the effect originally sought, the lack of co-ordination among direct instruments of environmental regulation and between them and economic policy tools has rendered these measures totally inoperable in many cases. What occurred in an area of southern Honduras provides a good example of this problem. The authorities prohibited the felling of mangrove trees in this region, where these trees are normally used as fuel for household and industrial use, without adopting complementary measures to provide viable alternatives for the population of the zone, whose livelihood is largely derived from this activity. The result was, of course, that the people continued to cut down these trees secretly after the ban went into effect.<sup>9/</sup>

#### 4. Environmental impact assessments (EIAs) as policy linkages

The object of an EIA is to predict and assess the environmental consequences of a given initiative, plan, programme or project before it is undertaken so that this information may serve as an input for the discussion concerning its implementation.

EIAs have primarily been conducted in connection with specific projects such as the construction of large-scale infrastructure works or large industrial plants involving products, processes or inputs considered to be environmentally hazardous. Obviously, however, the concept of an EIA and the associated methods and procedures can serve as a highly valuable tool for the effective implementation of environmental policies. EIAs can be used to evaluate a wide range of social initiatives having significant environmental repercussions, including everything from plans in general (proposed legislation, macroeconomic policy measures, and sectoral, regional or local development plans) to the actual execution of the specific measures provided for by such plans. EIAs can also provide information of crucial importance for the design and specification of the environmental policy tools described in the preceding section.

The Latin American countries which have drawn up legislation on this subject have, however, chosen to confine the application of EIAs to specific projects.



The identification of the environmental impacts of an initiative based on the information furnished by an EIA can lead to the proposal of protective and offsetting measures, to the replacement of the original project by other lower-risk options, or even to the cancellation of the initiative altogether. In the case of specific projects, EIAs may lead, for example, to the re-design of industrial processes, the modification of the size of a plant or to a change in the location of the project in question. Thus, EIAs are an essentially preventive instrument of environmental policy, but they can also serve as a valuable tool for the follow-up and supervision of projects that are undertaken.

Despite the promising nature of the concept, however, its actual application has been beset by numerous difficulties, as is attested to by the fact that it has come into regular use as an environmental management tool in only a very few countries. Nevertheless, as stated earlier, it may eventually come to play a role of fundamental importance in linking up the components of an environmental policy.

However, the fact that such environmental studies are conducted only in connection with specific economic projects rather than more general aspects of, for example, economic policy, tends to narrow the scope of environmental management. The construction of large hydroelectric plants may be used as an example to illustrate this statement. Society has shown a decided preference for this source of energy while to some extent underrating a series of other sources (e.g., solar energy, wind power, tidal power). If an assessment of the environmental impact of this sort of energy policy, taken as a whole, were conducted in which all these sources were considered rather than only hydroelectricity, it would permit the environmental advantages and disadvantages of each energy source to be identified and would, quite probably, demonstrate the desirability of pointing efforts to develop the energy sector in other directions.

The foregoing considerations suggest that a linked series of EIAs should be conducted starting at the global and sectoral policy levels and continuing on down to the level of specific projects. This sequential arrangement would also permit the relevant information to be compiled gradually, thereby lightening the workload in the final (i.e., project) stages, where the least amount of time is available for gathering and analysing the pertinent information. An EIA is not justified in the case of very small individual projects, but undertaking a linked sequence of EIAs would clearly be worthwhile when a number of such projects represent a large-scale activity when taken as a whole, as in the case, for example, of housing or land settlement programmes. In such instances, the sequence of EIAs would concern the programme rather than the individual projects.<sup>10/</sup>

Of course, not all projects or initiatives call for an in-depth environmental study. These studies are generally expensive, and it should not be forgotten that the ultimate justification for conducting such a study is to avoid doing damage to the environment which would result in a reduction of well-being or of growth potential. It does not make sense to carry out such a study if the cost of the EIA would far exceed the value of the benefits derived from it or if it took up so much time that decision-making would be delayed as a result. This is why a preliminary analysis is made (known as an environmental impact statement) before an EIA is conducted in order to determine whether or not to proceed with the relevant studies. Obviously, the preliminary analysis will indicate that such studies need to be carried out in those cases where it is found that a project's environmental repercussions warrant them.

Despite its limitations, the EIA is an especially promising means of addressing the task of co-ordinating and organizing the steps required to implement an environmental policy, since its main strength lies in the prevention and control of the possible environmental impacts of man's activities. In order to be effective the procedure should be subject to a number of requirements relating to, for example, its timeliness, the accuracy of the information and of the methods of analysis used, the provision of legal and institutional backstopping, community participation and, finally, a strong dose of realism.

##### 5. Financing mechanisms for the implementation of environmental policies

Another important consideration in ensuring the operability and effectiveness of environmental policies is the need to provide adequate financing mechanisms. Indeed, the experiences of most of the Latin American countries has shown that the lack of such mechanisms definitely jeopardizes a country's chances of carrying out a form of environmental management that will ensure a sustainable mode of development.

Although a great deal could be said about this subject,<sup>11/</sup> we will confine our comments here to no more than a few general points which may serve as guidelines for the formulation and establishment of special financing mechanisms.

If one grants the fact that a large part of the environmental services which help to provide the members of society with a certain quality of life are derived from a natural resource base that is, under certain circumstances, subject to depreciation, then it follows that the possibility of maintaining those services hinges on society's ability to prevent that depreciation or to replenish what is lost.<sup>12/</sup> In either case it is necessary to allocate resources. A society should behave just like any business

enterprise, which in part ensures its own survival by almost automatically setting aside a portion of its income in the form of a depreciation allowance.

Moreover, in most instances the environment is part of the public domain. This is true of the gene pool, most water courses and bodies of water, the coast, the atmosphere and vast stretches of a nation's territory, as well as the innumerable ecosystemic functions which man uses to his benefit. Although their character as a public asset may differ somewhat according to the laws of each country, mineral deposits, hydrobiological resources and natural forestry resources are also part of the national heritage, and while access to them may be granted in the form of use and production concessions or rights, their ownership may not be turned over to individuals.

From an economic standpoint, many of these assets have traditionally been regarded as free goods whose use has therefore not been subject to any restriction whatsoever. Today, however, the technological capabilities of modern society and the size of its population exert pressures which clearly make it impossible to continue this practice. This same society, through the State, must pay and must recompense itself for the use and abuse of those assets by means of mechanisms which ensure that part of the income derived from those assets is allocated for their care and maintenance.

Thus, unless a permanent social fund of adequate size is created in accordance with the above-mentioned considerations as well as a number of other criteria, a country's environmental managers will not be in a position to implement an effective policy aimed at engendering an environmentally sustainable form of development. As mentioned earlier, the recognition of this need by many European countries and by the United States is clearly evidenced by their use of revenue-producing economic instruments in order to secure at least the minimum amount of financing necessary to make their environmental policies operational.

#### 6. Participation of the citizenry

A final point which needs to be analysed from the standpoint of the operability required of an environmental policy is that of the participation of a country's citizens. A recognition and acceptance of the existence of differing views and conflicts of interest is an essential step in the achievement of social legitimacy, and such legitimacy is a sine qua non for an effective environmental policy. As is true of all authorities, environmental authorities need to have social legitimacy, not only at the time they are elected or appointed, but throughout the process of formulating, implementing and supervising their environmental initiatives. However, although essential, a recognition of these circumstances is not enough in

itself to accord legitimacy to an environmental policy or to make it effective. It is also indispensable that, among other things, the entire process be transparent, starting with the very first stage of policy design, and that participation, negotiation and arbitration mechanisms be incorporated into the various phases of the implementation process.

The mechanisms provided for community participation will differ according to each country's political and institutional traditions.<sup>13/</sup> Participation at the national level and, quite probably, at the state and regional levels as well should primarily be indirect, i.e., should be channeled through representatives elected or chosen by the various groups and agents. At the local or community level it may be possible for the population to participate more directly in the various stages of the environmental management process. In fact, in some cases in Latin America the municipalities have proven to be an administrative unit which is extremely well suited to participatory environmental management, since they are direct recipients of the population's environmentally-related demands and also perform the functions of planning, implementation and follow-up.

Obviously, specific mechanisms will have to be designed for each of these units in relation to various aspects of participation, such as the ways in which the people are to be brought together, the procedures for taking part in decision-making, the points at which participation is to take place, etc. This is of crucial importance in ensuring that such participation will increase the effectiveness of environmental management rather than hindering it.

Some developed countries, including the Federal Republic of Germany, have been experimenting with public hearings as a mode of community participation, and some Latin American environmentalists are advocating the use of such hearings in the region as well. Public hearings have been held especially for the purpose of informing the public about the findings of environmental studies concerning investment projects whose possible impacts may be a cause of concern to the community and for the discussion of alternative locations for activities or infrastructure works. This is certainly a promising idea, but the procedures for its implementation and the areas in which such hearings would be applicable must first be clearly defined.

Although they have not conformed to such definite schemes as that of public hearings, in some cases quite interesting forms of participation have been achieved in Latin America. One such case is the successful pollution control programme carried out in the city of Cubatão in Brazil.<sup>14/</sup> One of the factors that clearly played a role in its success was the fact that the authorities and representatives of the various sectors of the community worked together in determining what control strategy was to be used. The

negotiated, participatory process used to design the programme itself permitted the achievement of a high degree of transparency at all stages of the programme's execution and facilitated the forging of an agreement among the various interest groups as to the shared objective of transforming the city into a habitat in which productive activities and residents' needs would be compatible.

This experience appears to indicate that in order to make an environmental policy effective, it is important to bear in mind that the responsibility for protecting, conserving and upgrading the environment has to be shared by all the agents of society, including not only the various divisions of the State (i.e., the executive, legislative and judicial branches), but also individuals and businesses, as well as the organizations within society which act as intermediaries between the two.

### Notes

1/ Herman E. Daly (1989), "Toward a measure of sustainable social net national product", Environmental Accounting for Sustainable Development, Yusuf J. Ahmad, Salah El Serafy, Ernst Lutz (eds.), Washington, D.C., World Bank, June.

2/ Some conceptual and methodological proposals concerning the improvement of economic indicators have recently been formulated. See, for example:

Roefie Hueting and Christian Leipert (1987), "Economic growth, national income and the blocked choices for the environment", Berlin, Internationales Institut fur Umwelt und Gessellschaft, Wissenschaftszentrum Berlin [International Institute for Environment and Society, Berlin Center for Scientific Research] (mimeograph); and

Yusuf J. Ahmad, Salah El Serafy and Ernst Lutz (eds.) (1989), "Environmental and resource accounting: An overview", Environmental Accounting for Sustainable Development, Washington, D.C., World Bank, June.

3/ Most of the figures cited here are contained in a report on the fishery sector drafted by the technical teams which drew up the government programme for Chile's recently elected president.

4/ See, for example, Asit Biswas (ed.) (1981), Models for Water Quality Management, New York, McGraw Hill International Book Company.

5/ Richard C. Bishop, Thomas A. Heberlein and Mary Jo Kealy (1983), "Contingent valuation of environmental assets: Comparisons with a simulated market", Natural Resources Journal, vol. 23, No. 3, July.

6/ The policy should also, however, promote further research regarding the resources concerned so that regulations might be instituted as soon as possible to ensure a sustainable level and form of harvesting before these fishing grounds, too, are overexploited.

7/ J.B. Opschoor and Hans B. Vos (1989), Economic Instruments for Environmental Protection, Paris, Organization for Economic Co-operation and Development (OECD).

8/ France, the Federal Republic of Germany, Italy, the Netherlands, Sweden and the United States.

9/ See ECLAC (1989), Estrategia para el desarrollo sostenido de la región sur de Honduras (LC/R.742), Santiago, Chile, March.

10/ Norman Lee (1982), "The future development of environmental impact assessment", Journal of Environmental Management, No. 14, London, Academic Press Inc.

11/ For a discussion of proposed financing mechanisms in reference to Chile which are, however, of much broader applicability, see Osvaldo Sunkel (1989), "El desarrollo sustentable: del marco conceptual a una propuesta operacional", Chile piensa a Chile. Tercer Encuentro Científico sobre el Medio Ambiente. Ponencias centrales, Centro de Investigación y Planificación del Medio Ambiente (CIPMA), vol. 1, Concepción, Chile.

12/ See Santiago Torres and David Pearce (1979), "Welfare economics and environmental problems", International Journal of Environmental Studies, vol. 13, London.

13/ See Santiago Torres and Federico Arena (1985), "Medio ambiente y región: ámbitos clave para la gestión democrática de un desarrollo nacional sostenible", Ambiente y desarrollo, vol. 1, No. 3, Santiago, Chile, Centro de Investigación y Planificación del Medio Ambiente (CIPMA), October.

14/ See J.P. Galvao Filho (1987), "Controle da poluição ambiental: cubatão, filosofia e conceito", Ambiente. Revista CETESB de tecnologia, vol. 1, No. 2.