

# CEPAL

## Review

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## Review

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## Participation and the environment

*Tonci Tomic*<sup>\*</sup>

The petroleum-based production pattern has ultimately proved to be a dead end as the deteriorating quality of natural resources—owing to the way they have been used and appropriated—has begun to cast doubt upon the pattern's viability. Repeated soundings of alarm on this score have increasingly sensitized the population, thus creating a level of ecological awareness that has moved society to voice its ever more vehement rejection of a system which bases itself on the destruction or degradation of natural resources and, in so doing, jeopardizes the sustainability of the development process.

At the same time, a variety of factors—including such diverse elements as financial constraints and demands for the consolidation of democracy—have prompted a restructuring of the institutional system. One of the most immediate effects of this has been a downscaling of the State's sphere of activity relative to the presence and action of civil society; one of its delayed effects has been the deconcentration of political power.

These two factors make it necessary to forge a link between the issues of environmental sustainability and societal participation in order to devise an approach capable of generating operative responses to the development challenge facing the countries of the region.

The author analyses a possible approach to environmental issues, puts forward a number of hypotheses regarding the social and institutional dynamic, gives his interpretation of the origin of political power and the forms it takes, and presents a number of action proposals. The article focuses on these issues within a rural setting, and for that reason the suggestions it contains are also made from a rural perspective; none the less, they can be extrapolated to other areas. The proposals made here deal with the steps that need to be taken before a sound, comprehensive effort can be mounted to halt the degradation of ecosystems and the deterioration of the region's natural resources: something which simply cannot be accomplished without the active participation of the social sectors linked to these resources.

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## Introduction

The relationship between participation, the environment and sustainable development has extremely important implications for our future. As stated in the Rio Declaration on Environment and Development, "Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided."<sup>1</sup> Clearly, however, a great deal remains to be done before these types of precepts can be put into practice. Indeed, working definitions of such concepts as "environment", "participation" and "sustainable development" have yet to be agreed upon, and the lack of such definitions further obscures the ways in which these elements interact and the operational means that could be used to put them into practical effect. Nevertheless, demands for genuine, swift and effective incorporation of these dimensions into our daily lives are growing, as is the necessity of doing so in order to put a stop to processes of environmental degradation which may prove to be irreversible if the current situation is allowed to remain unchanged; an awareness of this fact is implicit in the Rio Declaration.

One major impediment to more comprehensive, precise conceptual and methodological work in this field is the lack of information, in a wide range of areas, on ecosystems and on the status of the environment and how it is changing. For example, many of the plants in the Amazon region have not yet been catalogued; consequently, the behaviour of these ecosystems is not fully understood and the potential pharmaceutical value of these unknown species cannot be assessed. This lack of information is a problem in respect of both baseline evaluations and environmental monitoring; in other words, we have

<sup>1</sup> Principle 10 of the Rio Declaration on Environment and Development, which was signed by the Presidents of the nations represented at the recent United Nations Conference on Environment and Development (Brazil, June 1992).

neither a full picture of the present status of the region's agro-ecosystems nor institutionally tested systems or methodologies for collecting the information that would allow us to monitor qualitative and quantitative changes in these ecosystems and to evaluate the effects of different measures and policies.

The theoretical analysis of this subject requires an ability to work at very high levels of complexity and abstraction due to the specificity of many aspects of the processes involved, the vast number of variables to be dealt with, and the nature of their interaction, all of which is, in addition, skewed by their particular context. Otherwise, we run the risk of falling back on simplistic, overly linear definitions of the parts which the various social actors should play in forging a way of life and a system of production conducive to the sustainable development of forestry, agricultural and fishery resources.

The discussion contained in the following pages is intended to foster a debate based on a careful examination, within a specified context, of certain elements that will have to be taken into consideration when society, through the relevant agents, arrives at the point where it begins to undertake participatory action in respect of the sustainable development of the agricultural, forestry and fishery sectors.

Generally speaking, in regard to the link between participation and the environment, it will be argued that both the conventional political system and civil society can serve as platforms for social participation and that, given the constitutional char-

acteristics of Latin American societies, both of these spheres need to be taken into account. It is important to bear in mind that these societies are overly socialized and marginalized<sup>2</sup> and, as a result, individuality<sup>3</sup> is only just beginning to emerge as a fundamental element of civil society.

Today, there is a tendency to think that participation emanating from civil society is more "effective" or more "genuine" than conventional, indirect forms of participation. The problem with this is that Latin America's civil societies are relatively weak agglomerations, whereas its traditional political system is stronger and more fully consolidated. The region must therefore channel some of its efforts towards strengthening its civil societies as a means of augmenting direct participation. At the same time, however, traditional forms of participation through political parties should not simply be discarded, since they can indirectly help to strengthen the various spheres of civil society itself. In summary, it is not a question of substituting one type of participation for another but rather of striving to integrate the two and to expand their potential range of action while recognizing the specific features of each of these forms within the Latin American context.

Within the scope of this analysis, and with a view to helping to lay the foundations for a sustainable form of agricultural and rural development, three fields are discussed in which steps could be taken to promote participation: information, technological progress and environmental monitoring.

## I

### Environmental issues and ways of addressing them

The deterioration and degradation of the region's agricultural ecosystems pose a problem that could be described as being a "by-product" in that it is not the result of some social agent's deliberate decision to damage the environment, but is instead an unsought effect of a certain way of appropriating and using natural resources. Stated in broader terms, we could describe the situation as being one in which the decisions taken by economic and political agents have generated negative externalities<sup>4</sup> which have gone undetected by the market-based system of resource allocation and which, in consequence, this system

<sup>2</sup> Exaggerating somewhat for the sake of illustration, some anthropologists have contended that our society's mechanisms of social interaction still exhibit some of the traits of tribal societies.

<sup>3</sup> The term is used here to denote a particular set of complex traits (desires, aptitudes, creativity) which differentiate individuals from one another, rather than as a synonym for "individualism".

<sup>4</sup> Studies commissioned by the World Bank have shown that some policies, especially on credit and subsidies, have promoted the deforestation of the Amazon region without affording any major benefits to the countries concerned. See Mahar (1989) and Binswanger (1989).

has failed to correct by assigning a value to environmental degradation.

This process has two starting points: one is structural in nature and is related to the social distribution of resources, while the other is of a functional character and is associated with resource use, chiefly in terms of technology.

One of the most contradictory aspects of the destruction of the environment is that even though it is a direct consequence of the environment's economic exploitation, the cost of environmental deterioration is borne by society as a whole, rather than by the direct beneficiary of that exploitation. In the traditional approach to project evaluation, a resource's value is estimated by calculating the net discounted income flow that it generates, assuming that the resource itself remains unchanged; consequently, this form of economic appraisal does not incorporate the resource's destruction or deterioration as a project cost.<sup>5</sup> It may therefore be supposed that many natural-resource investment projects are "profitable" only because their evaluation has not included the costs associated with the destruction of the natural resources they are using.

Part of the problem has to do with the fact that the pace of technological innovation is outstripping the region's capacity for institutional readjustment. Indeed, the rapid spread of technical progress and economic expansion seem to have occasioned more negative externalities than public and private institutions can handle.<sup>6</sup>

One of the stumbling-blocks in the search for solutions to environmental problems is the lack of a single, clear-cut origin from which a definite train of events can be traced. Many experts feel that the

development style itself is the cause of ecosystem deterioration.<sup>7</sup> This means that, in many cases, so-called "environmental problems" cannot be solved solely by means of environmental measures as such but instead call for efforts in a number of different areas, including, perhaps, economic measures or direct political action.

Second, devising a participatory strategy for addressing environmental problems is difficult because it is not clear which parties are in conflict with one another; i.e., we do not know exactly which sociopolitical agents are involved or which sphere or level is the most suitable for resolving a given dispute.

Third, the intertemporal character of the problem,<sup>8</sup> along with uncertainty as to what questions decision-makers need to ask, hamper policy-making and participation by the relevant agents. If the choice is expressed as being between approving or disapproving of environmental destruction and deterioration, the answer is obvious; but it is not so obvious that, under present real-world conditions, there really is an environmentally sustainable option which society is willing to accept, given the costs and benefits of the necessary changes and the social distribution of effort and of rewards.<sup>9</sup>

If we take the case of the destruction of the Amazon region as an example, the first questions that arise relate to deforestation and indiscriminate clearcutting, which are obviously the direct causes of the region's destruction. How are we to continue developing and utilizing this ecosystem without destroying it? Are there viable alternatives to slash-and-burn agriculture? Is it possible to mine gold without using mercury? Are companies really willing to manage the Amazon rain forest in an

<sup>5</sup> It must be remembered that the taxes paid by the citizens of a given country represent the sum society is charging them for the exclusive right to draw the income generated by the resource in question and for the use of the relevant infrastructure (whose cost has been borne by society), without which this income could, in many cases, not be generated at all.

<sup>6</sup> Kemp and Soete (1990) develop this idea, while Goran-Maler (1990) contends that, in accordance with the principle of thermodynamics, as the pace of economic growth speeds up, the degradation of natural resources will also accelerate. Although this is true in a general sense, it overlooks the possibility of opening up new spheres of activity in connection with products that have no environmental impact (something analogous to the continuous upgrading and zero-fault processes to be observed in today's informatics-based industry).

<sup>7</sup> See, in particular, the studies prepared by the Joint ECLAC/UNEP Development and Environment Unit, especially those conducted by O. Sunkel, N. Gligo, G. Gallopin, P. Gutman, A. Herrera, H. Urtubia and I. Sachs, among others.

<sup>8</sup> This concept of intertemporality has arisen out of the various definitions of sustainability that have been advanced, particularly the one framed by the World Commission on Environment and Development (more commonly known as the Brundtland Commission), which is also the most generally accepted one. According to that definition, in order for there to be sustainability, natural resources must be used in ways that take into consideration both present needs and the needs of future generations.

<sup>9</sup> An intertemporal option is implicit in the concept of sustainable development.

environmentally sound manner? How are the costs (and benefits) of heightening the greenhouse effect to be distributed, given the role played by this ecosystem in its generation? These and other questions are particularly important, because the development of the Amazon jungle cannot be halted but only modified.

When the problem is stated in these terms, it may be seen that a number of the agents involved have at least two different roles: they are acting as citizens, who want the best for their country, and as economic agents, who need to produce or, depending on the particular case, at least survive. If the necessary strategy changes are made too swiftly, the consequences could range from lost profits to the disintegration of a social group.

This is, to some extent, the context of environmental issues in Latin American agriculture. The interests of some agents conflict with those of others, as do those of private agents and the State. Moreover, the amounts of political clout and influence wielded by the various groups differ substantially. The complexity of such issues is further increased by the agents' dual roles and by the lack of dispute settlement mechanisms. Consequently, during the problem-identification stage it is very important to determine how the various agents are aligned so that realistic answers can be found for the above-mentioned questions and so that the resulting proposals can be implemented through a process of negotiation. This rough outline applies to all the various ecosystems found in the region, but it takes on special urgency in the case of the most fragile ones.

If these factors are not taken into consideration when dealing with environmental issues, attempted solutions may backfire. In a democratic system, decisions cannot be put into effect or maintained without the backing of real social agents, whether that support is channeled through the conventional political system or through civil society. In fact, if environmental problems are not approached with a sense of political realism—which is often no more than just plain common sense—the steps taken may prove to be counterproductive. For example, if the members of a community are simply asked whether they wish to continue the exploitation of the ecosystem or not, they will probably say that they want to continue utilizing it as they have in the past; if traditional

methods of exploitation do continue, however, the consequence may be the destruction of that ecosystem. Hence the need to use suitable methods for eliciting the opinions of the community and to apply those methods correctly.

The participation of the citizenry plays an essential part both in legitimizing the instruments used by society—through its democratically elected public officials—to deal with environmental issues and in arriving at decisions and taking direct action within the framework of the measures to be implemented.

At least three spheres of action are involved in the legitimization of such instruments:

(i) The law. The countries need to fashion a legal framework for environmental issues that will permit their institutionalization and, thus, the establishment of legal guidelines for resolving problems caused by conflicts of interest among individuals or between the State and private individuals which lead to the destruction or deterioration of the environment.

(ii) The economy. Policy incentives and disincentives or, when appropriate, regulations will have to be used in order to actually put into practice the thesis that the cost of ecosystemic degradation should be paid by those who benefit from that degradation or who bring it about.

(iii) Politics. The system's capabilities for adopting structural solutions (such as altering the property structure or broadening and democratizing channels for political and civil participation) need to be upgraded. The current situation in the world being what it is, the latter step, in particular, involves promoting deconcentration, de-localization and, above all, decentralization; in other words, it entails strengthening regional and local forms of participation and social control.

Thus, it is a question of bringing problems and solutions closer to each other and of encouraging the people actually concerned to take part in the effort to improve their living conditions and their environment. Apart from any other considerations, it would simply be ineffective to approach such problems in any other way since, without the participation of all relevant actors, hierarchic democratic systems tend to promote uniformity and to display a disregard for regional or local characteristics, which must be taken into consideration in order to resolve environmental issues.

## II

### Participation and power

While the connection between participation and power is obvious, since, when a person participates, what he or she is actually doing is exercising power, it is important to remember that participation can be channeled either through the political system or through civil society.

A few words of explanation are perhaps called for here. Power can be defined in simple terms as "some degree of ability to direct society along a desired path, i.e., a situation in which one agent's will to act prevails over that of other agents in society who have opposing ideas". The "social will to act"—as an organizational phenomenon—resides primarily in political parties, with such parties being understood as broader expressions of the interests of given social groups which rise to political prominence when they reach a point where, besides having attained some awareness of their own identity, they "tend to see their interests as transcending their own particular milieu and interpret them as being the interests of other groups, i.e., when those interests are presented as a proposition for the whole of society". "Thus, the panoply of leading players within the political realm is composed of political parties which, independently of their origin and of the set of institutions and individuals concerned, become actors because they are able to publicly express their social will. All such parties must confront the force of each other's wills. This interaction is what is known as the alignment of political forces, which is what ultimately transforms the will to act into the ability to act. The alignment of political forces as such is therefore the axis of power; consequently, the attainment of societal dominance—power—is the shifting of a given alignment of political forces in one's own direction" (Briones, 1990).

Therefore, any proposals to be made should take conventional political participation into consideration as a legitimate, widespread form of participation in Latin America's societies; to that end, the formation of solid, stable party structures should be promoted as a way of consolidating and improving the region's infant democracies and of dealing more effectively and

realistically with problems of ecosystemic destruction and deterioration.<sup>10</sup>

This does not eliminate the need for political action to strengthen regional and local channels for institutional participation in the discussion and adoption of decisions leading to the institutional modification of the structure of the State. Moreover, any attempt to sidestep political parties would be naive, since in a sense this would be tantamount to assuming that neither the State nor the laws that govern it have any validity.

The other sphere of participation is that of civil society, which is largely composed of all those groups having a distinct identity that do not purport to be societal interpreters of the "majority"—a concept which is becoming increasingly difficult to define, given the vast array of differing interests and forms of expression to be found in society. Two factors warrant particular attention in this connection: the importance of establishing and strengthening organizations that will seek to protect the environment and of promoting sustainable long-term growth, and the need to find ways for different interest and pressure groups to arrive at agreements among themselves so that a positive-sum process can be initiated at a more general level.

An increasingly evident fact underlying the dynamic of interest-group formation is that apparently "no social group is capable of thinking for the whole of society on the basis of its own interests".<sup>11</sup> Therefore, the guiding principle for our very necessary efforts to create mechanisms and channels for participation—at this stage, direct participation in decision-making—should be the need to devise consensus-based formulas, since the collective interest will necessarily be determined by an agreement that has been negotiated by the parties concerned once they have ceased to strive for uniformity and begun to seek out a synergic linkage among heterogeneous elements.

<sup>10</sup> There is probably a need for the parties to reform some of their basic conceptual aspects and to modernize so that they can adapt to new conditions and challenges, but they are already exhibiting some degree of awareness and concern about the degradation of the environment.

<sup>11</sup> N. Lechner, cited by Koolen (1990).

### III

## Types of societies and forms of participation

Recent history shows us that, following what different experts have described as the third, fourth or fifth industrial revolution,<sup>12</sup> the more successful countries or groups of countries have been those which have done a better job of incorporating the civil society into national affairs. In other words, countries with weaker civil societies now appear to be less able to meet their population's overall needs. Corroborative evidence for this statement is supplied by the collapse of socialist regimes in Europe and the demise of the military dictatorships which had dominated the political scene in Latin America for the past 20 years. Regardless of any specific achievements which these models may have attained in the past, the fact is that they are no longer even in the running. Interestingly enough, both of these models, by definition, were not based in the civil society; on the contrary, they were based on its systematic destruction.<sup>13</sup>

In contrast, the countries of Western Europe and North America—one of whose political traits is that they permit a greater degree of participation on the part of civil society—have been strengthened in various ways and means.

This is, in turn, related to what has been called the new technical/production paradigm<sup>14</sup>—the paradigm towards which the developed world is now making a transition on the basis of a revitalized technological platform. From a political vantage point, in this new paradigm groups do not appear to be vying for absolute power; instead, what is emerging is the idea of a firm resolve to build a consensus within the realm of political action. In the economic/social domain, the paradigm appears to have no model whatsoever, but is instead associated with a number of

central focuses which can be summed up by the precepts of economic growth, democracy, social equity and participation, and environmental sustainability.

Latin America, however, has proven to be a political hybrid whose heterogeneity is its distinguishing feature: without being even remotely socialist, it is comprised of strong States and relatively weak, socially fragmented, poorly articulated civil societies.

None the less, the Latin American countries' political systems and, in particular, their political parties are now in the throes of a legitimacy crisis. The most tangible evidence of this phenomenon is the appearance on the electoral scene of an "anti-party" vote which has made its presence felt in recent elections. Consequently, political parties are no longer the only path to the presidency of a country; there are other sources of legitimacy—such as fame, success, a reputation for honesty—and in some cases it is actually better to be viewed as having no political party connections. The explanation for this seems to be that the electorate has reached its saturation point with the system of political parties itself—for reasons ranging from ineffectiveness or excessive centralism to corruption—<sup>15</sup> together with a feeling that the electorate is called to the voting booth to legitimize agreements and acts decided upon by the party leadership rather than to take political decisions.

Thus, in addition to socioeconomic marginality we now have political marginality as well, owing to the fact that the overly standardized structures and concepts upon which traditional parties have been founded have caused them to close ranks around internal groups, thereby losing their identity and legitimacy in the eyes of the party rank and file, even in the case of grassroots parties.

This has begun to spark a desire for modernization, especially within the framework of centre-left innovations. The question to be answered is therefore how to go about integrating all the social

<sup>12</sup> Regardless of the number chosen, the reference made here is to the changes that occurred worldwide during the 1970s and 1980s.

<sup>13</sup> This statement is valid in theoretical terms, given the type of society in which these models were applied. In practical terms, however, a civil society did indeed exist, even if it had to go underground; in fact, it was precisely this civil society which, once it had regained some sort of communications link, exposed the authorities' lack of legitimacy and their origin in these dictatorial/hierarchical models.

<sup>14</sup> The studies conducted by Pérez (1989) on this subject are of particular interest.

<sup>15</sup> It should be borne in mind that the State and, hence, political parties have seen their sphere of activity reduced while, on the other hand, the market has been gaining legitimacy as the main new mechanism of resource allocation. This development is associated with the process of replacement of paradigms.



strata; otherwise, the populace's poor opinion of the political party system will probably grow even worse.

This process of change can be expected to contribute, in the medium term, to the reform and readjustment of the political system, and it will probably help strengthen civil society as well; this is, after all, the direction in which the new "social pact" is carrying today's world. Latin America cannot opt out of this process, just as it cannot escape the widespread re-emergence of democracy.

In sum, it has been observed that when a civil society is relatively solid, community participation occurs at the decision-making level and takes a direct

form, usually in regional and local forums. When the political system is strong, on the other hand, political parties intervene in such participation by playing a role in its legitimization, and the institutional framework for community participation tends to become centralized.

Those countries where the civil society is more developed and is therefore more fully incorporated into the country's day-to-day affairs will be better equipped to meet the challenges posed by this new phase of development, and support for the consolidation of a reinvigorated civil society will bring the country closer to its goals of growth, social equity and sustainability.

## IV

### Participation and the environment: some proposals

The foregoing hypotheses suggest that efforts should chiefly be focused on designing strategies for stimulating the formation and reinforcement of civil society and on defining institutional channels for direct participation. Simply defining such channels is not enough, however. In the absence of a civil society in the process of consolidation, efforts to deal with environmental issues may be thrown into disarray, and existing conditions may grow even worse. Hence the need for ongoing action to promote the organization of social groups based on various identificatory criteria (e.g., corporate, territorial, ethnic or other interests), since only an organized society is capable of effective participation. At the same time, an equally determined effort must be made to build a transparent party system that will provide society with a vehicle for indirect participation.

A number of proposals regarding more specific spheres of action are presented below.

#### 1. *Dissemination and information*

In dealing with environmental issues, and specifically those types of issues that arise in rural areas, the first step is to disseminate information as widely as possible throughout the various levels of society. Without information, decision-making capacity is sharply reduced, while the possibility of

manipulating public opinion increases. Therefore, it is extremely important for the populace to be well informed about the institutional system, its characteristics, the way it operates, and exactly what things users have a right to demand of it. It is also necessary for there to be a wide distribution of accurate information about the specific issues being addressed; only then can users become proficient in handling the relevant information, fully understanding the issues, realizing how those issues affect them, determining how to address them and with whom, and taking decisions in real-life situations. For example, peasant farmers, settlers and indigenous groups living in the Amazon region or those who obtain their livelihood from the mangrove swamps should know how the destruction of those ecosystems would affect them and the rest of the human race, what their strategic options are, which political and social agents are arrayed on each side of the issue, what specific proposals the State has made, and how any possible negotiations would be structured.

It is highly likely that the mere dissemination of information in a suitable manner, along with the interaction to which this would naturally lead, would be enough to spark an intense debate and to engender a genuine participatory process; unless this is done first, it might well be somewhat irresponsible to set in motion what would then be no more than imitative participatory processes.

## 2. Technology

Technology constitutes a second area of action. If part of the environmental deterioration now taking place is seen as being the sum of the effects of a vast number of individual acts, then one of the most effective ways of participating in the conservation of the environment is for each agent –in this case, each farmer– to try to conserve his own farm, i.e., to try to manage each plot in a more sustainable fashion. And the way to do this is with technology. It is important for the user to play an active part in identifying, adapting and disseminating the technology to be applied.<sup>16</sup> It is also essential, however, that technological research go beyond the bounds of the experimental station; the importance of such stations should be recognized, but the mere concept alone is not enough for this new stage of development. In addition, ways should be sought to start up an even-handed dialogue between technical experts and farmers. Thought could be given, for example, to the possibility of setting up experimental fields and of fostering an ongoing dialogue among the agents associated with specific ecosystems as a means of generating practical solutions for promoting the productive management of these ecosystems. (In fact, some experiments of this type are already being conducted in the region.)

Another promising approach is to have the users participate directly in such experiments so that, with the help of coordination provided by research institutes, universities and agribusinesses, the farmers themselves can head up the effort to find, adapt and select technology.

These and other forms of interaction among agents will enable agricultural producers –especially traditional peasant farmers and indigenous groups– to contribute their own expertise, which, it should be remembered, has permitted them to utilize the various ecosystems of the region for quite a long time in what, from an environmental standpoint, has been a fairly successful manner. Today we have an opportunity to rework the wealth of knowledge contained

in the cultures of these social groups, to transform its empirical basis into a scientific one, and to disseminate it adequately.

## 3. Environmental monitoring

A third area of action, which is crucial in providing the system with feedback, is the design and implementation of an environmental monitoring system. This system would be supplied with information from existing databases and from the members of the community who use the relevant agro-ecosystems. An institutional mechanism would have to be set up for this purpose, preferably at the local level, which would in turn be coordinated by national bodies (e.g., natural resource institutes). These bodies would take in this information and design a set of indicators for use in monitoring changes in the relevant ecosystems in order to ascertain the status of these ecosystems and provide input for decision-making at that level. Indeed, it is simply not possible to deal with environmental issues in a consistent manner without an information and statistical monitoring system that will make it possible to quantify some of the variables concerned and to keep close track of the impact of the resources used and the policies applied in the ecosystems in question.

Finally, it is necessary to continue strengthening community organizations and forming groups of people who share a common identity. Special mention should be made here of the work being done in the region by non-governmental organizations and the Church, which have served as the real engines of community development. Now, with democracy's re-emergence, the State can join in those efforts.

Taking action in the areas outlined in this article will make it possible to address many of the region's environmental problems in a responsible, balanced manner. Such action needs to be taken in a way that will elicit broad-based participation and consensus so as to create a genuine willingness to solve these problems. The basic methodological approach should be to target activities that will set in motion participatory processes; this should help to refine the measures being implemented and to carry forward the efforts now being made to find ways of coping with new problems and challenges.

<sup>16</sup> This applies to any sort of technology, whether highly advanced, traditional or any combination of the two; the important thing is for the technology to be geared to the area in which it is to be applied.

### Bibliography

- Binswanger, H. (1989) *Brazilian Policies that Encourage Deforestation in the Amazon*, Working Paper No. 16, Washington, D.C., World Bank, Environment Department.
- Briones, A. (1990): *El zorro con espinas*, Santiago, Chile, Editorial Documentas.
- Goran-Maler, K. (1990): Economic theory and environment degradation: a survey of some problems, *Revista de Análisis Económico*, vol. 5, No. 2, Santiago, Chile, Latin American Institute of Social Theory and Social Studies (ILADES)/Georgetown University.
- Kemp, R. and L. Soete (1990): Inside the "green box": on the economics of technological change and the environment, Freeman and Soete (eds.), *New Exploration in the Economics of Technical Change*, London, Printer Publisher.
- Koolen, R. (1990): "Algunos aspectos institucionales para un desarrollo sustentable en América Latina y el Caribe", Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC)/ United Nations Environment Programme (UNEP), *mimeo*.
- Mahar, D. (1989): *Government Policies and Deforestation in Brazil's Amazon Region*, Washington, D.C., World Bank.
- Pérez, C. (1989): *Technological Change, Competitive Restructuring and Institutional Reform in Developing Countries*, Strategic Planning and Review Working Paper No. 4, Washington, D.C., World Bank.