

VOL.  
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Recently IICA prepared methodologies and management tools that are based on guidelines found in Chapter 14 of Agenda 21, which focuses on agricultural and rural development. This book addresses topics on microregional diagnosis in the first stage of participatory planning at the local level.

The book is in line with the policies of decentralization of the state and promotion of citizen participation. The methodology proposed underscores the potential of municipalities (even recognizing their weaknesses and their need for profound change) for becoming the basis of our democratic systems. It highlights their responsibilities for conducting transactions and negotiating differences among the different social actors. The key objective of this publication is to present an approach to the design of diagnostic methodology that looks at the retrospective and current spatial scenarios. These are then used as inputs for designing a prospective scenario as an orientation for a strategy for sustainable microregional development.

This book is useful for professionals and decision-makers in the areas of rural development, sustainable development, municipal planning and related disciplines. The purpose of this publication, the fourth in a series being produced by IICA in conjunction with the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) and other international organizations, is to provide those interested in the topic with up-to-date information, methods and management tools to facilitate modern management of local government and private organizations involved in the planning and execution of sustainable development activities.

The aim of "Sustainable Development: A Methodology for Microregional Diagnostics" is to orient local participatory planning efforts to adopt an interdisciplinary approach whose objectives are to characterize the situation of a municipality and strengthen the capacity of local governments to manage their municipalities efficiently. At the practical level, the diagnostics are based on the overall principle of geo-referencing the problems and potential of a given territorial unit in order to focus investment, address the main institutional and management problems and reach specific social groups.



## SUSTAINABLE DEVELOPMENT A METHODOLOGY FOR MICROREGIONAL DIAGNOSTICS



VOL.  
3

Orlando Plaza  
Sergio Sepulveda

SUSTAINABLE DEVELOPMENT: A METHODOLOGY FOR MICROREGIONAL DIAGNOSTICS / Orlando Plaza / Sergio Sepulveda / IICA



## WHAT IS IICA?

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialized agency for agriculture of the inter-American system.

As a hemispheric technical cooperation agency, IICA can be flexible and creative in responding to needs for technical cooperation in the countries, through its thirty-four Technical Cooperation Agencies, its five Regional Centers and Headquarters, which coordinate the implementation of strategies tailored to the needs of each Region.

The 1994-1998 Medium Term Plan (MTP) provides the strategic framework for orienting IICA's actions during this four-year period. Its general objective is to support the efforts of the Member States in achieving sustainable agricultural development, within the framework of hemispheric integration and as a contribution to human development in rural areas.

The Institute's work is aimed at making changes in agricultural production, trade and institutions and in the people who work in the sector, using an integrated and systemic approach to development, which is based on competitiveness, equity and solidarity as the key to achieving the sustainable development of agriculture and rural areas.

The Member States of IICA are: Antigua and Barbuda, Argentina, The Bahamas (Commonwealth of), Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, the United States of America, Uruguay and Venezuela. Its Permanent Observers are: Arab Republic of Egypt, Austria, Belgium, Czech Republic, European Communities, France, Germany, Hungary, Israel, Italy, Japan, Kingdom of the Netherlands, Portugal, Republic of Korea, Republic of Poland, Romania, Russian Federation and Spain.

## SUSTAINABLE DEVELOPMENT A METHODOLOGY FOR MICROREGIONAL DIAGNOSTICS

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## PREFACE

For most countries in Latin America and the Caribbean (LAC), the first half of the Nineties was characterized by the radical transformation of international trade and economic relations, the redefinition of the public agricultural sector and its increasing linkages with the private sector, rapid advances in globalization and multilateral trade and the renewed dynamism of regional integration.

In an analogous fashion, the social and political context in the hemisphere has evolved towards more democratic forms of government via a greater participation of civil society. One of the key aspects of these transformations has been the devolution to local governments of the decision-making and resource allocation powers of public sector and central government entities. These measures are intended to bolster the democratization process through the dynamic participation of civil society in the planning and execution of development strategies, programs and projects.

Although the aim of these trends is mostly productive and commercial transformation, in their wake they have brought serious negative social and ecological externalities. Growing rural and urban poverty and the quickening pace of natural resource depletion could actually threaten the social and political stability of some countries. The macroeconomic changes have seriously affected various social strata, particularly indigenous ethnic groups, women and rural youth.

As part of its commitment to the sustainable development of agriculture and the rural milieu, the Inter-American Institute for Cooperation on Agriculture (IICA) has responded to this context by producing methodologies and management tools designed to capitalize on the prevailing economic, political and ecological trends and give LAC countries an edge in the ongoing negotiations with their major trading partners. The principal frames of reference for the Institute's

proposals are Agenda 21, the Copenhagen Social Development Summit, the Uruguay Round of GATT, the WTO norms and, of course, the Miami Summit of Presidents.

The productive and commercial transformation of the agricultural sector are the linchpins of the development model proposed by the Institute. While recognizing the importance of these two factors, however, the paradigm explicitly includes the social and ecological dimensions, in order to ensure the equilibrium of the national development model. In the case of production and trade, policies are needed to foster the competitiveness of the agriculture sector in general, and agribusinesses in particular. Actions in the social dimension, on the other hand, must ensure the establishment of policies that guarantee the equitable social and spatial distribution of the benefits of development. Efforts in the ecological dimension should be geared toward the design and implementation of macro, meso and micro-policies that ensure the rational management of natural resources and the environment in the long run. The management of these three elements calls for policy instruments and national development strategies that harmonize short and long-run objectives. This is undoubtedly one of the principal challenges faced by the LAC countries.

The process of political and institutional transformation is bringing to center stage a set of core issues, such as decentralization, the privatization of some public production support services and the transfer to local governments of many new functions pertaining to the provision of public services. This in turn has created a series of new demands for technical cooperation to assist local governments in discharging their new responsibilities. These events provide an historic opportunity for implementing a development model incorporating the four dimensions described within a manageable territorial unit.

The quickening pace of overall change has resulted in an enormous increase in the demand for technical assistance. The Institute is therefore obliged to construct applied methodologies to combat spatially located problems such as rural poverty, the low levels of productivity of traditional agriculture, and the depletion of natural

resources. The solution to these problems lies in well defined and focused interventions and investments in order to improve living conditions in the rural milieu.

The result of this challenge has been the development of simple, user-friendly planning methodologies designed to equip local governments with the appropriate tools and facilitate the participation of civil society in the decision-making process at the municipal and microregional levels. Thus, the aim of this book is to provide local government officials with a didactic instrument that shows them how to prepare basic microregional diagnostics for the formulation of sustainable development strategies and projects, consistent with a multidimensional vision of the process.

Although this methodology is an important component of the sustainable rural development approach, it is not intended to replace the theoretical underpinnings of the numerous disciplines of which it is composed. On the contrary, it aims to contribute to their systemic organization in order to generate accurate, objective, useful and practical diagnostics.

The main arguments put forward in this model pertain to the interactions between the socioeconomic, institutional, productive and ecological dimensions, which in turn calls for the reconciliation of short- and long-run objectives. Analysis of these dimensions makes it possible to delimit the microregion, depict its principal limitations and potential and, of course, determine the present living conditions of its inhabitants.

In short, this methodology identifies the productive and social potential and the main bottlenecks of a given spatial unit in order to focus long-term public and private investment.

This book forms part of the ongoing efforts of the Institute, which has established strategic alliances with a number of institutions for this purpose and engaged in joint work with distinguished professionals in several LAC countries. In fact, the design and validation of this

methodology was one of the activities of the IICA/GTZ/BMZ1 project and drew on the work carried out in the Colca Valley in Peru and in the Municipality of Purranque, Region X, in Chile in early 1995. The authors were aided in their efforts by the Ministry of Agriculture of Peru and the Agrarian Development Institute (INDAP) of Chile. The success of the work was due in large measure to the creative participation and boundless energy of professionals such as Carlos Salazar and Molvina Ceballos of the Center for Development Studies and Promotion (DESCO) in Peru; Octavio Sotomayor of the Agrarian Research Group (GIA), the INDAP team in Region X in Chile, and the professors and students of the Catholic University in Lima and the National University in Arequipa. The effort would, of course, have been unproductive without the contribution of the representatives of civil society and local government officials in the two countries.

A valuable contribution was also made by Helio Fallas who, drawing on his professional experience, managed to improve the preliminary version of the book by expanding some of the concepts used and reorganizing the content. A number of other professionals helped to polish the original Spanish text. Roberto Flores was responsible for editing the technical content a second time; Xenia Pacheco, for developing the didactic exercises; and Sergio Pacheco and Francisco Ocampo for the graphics.

This publication is the third in a didactic series on Sustainable Rural Development being prepared by the Institute in its efforts to provide applied methodologies to underpin the proposed development approach. The other titles in the series are: i) Microregional Development. A Strategy for Achieving Equity; ii) Sustainable Rural Development. Methodologies for Microregional Diagnostics. Literature Review; iii) Methodology for the Design of Sustainable Microregional Development Strategies; iv) Agriculture, Natural Resources and Sustainable Rural Development. Selected Readings;

v) Institutional Framework and Social Organization for Sustainable Rural Development. Selected Readings.

This methodology is targeted at professionals and supporters of sustainable rural development. It is our hope that it will be particularly useful for local government officials, civil servants responsible for the design and execution of regional and microregional development policies, members of civil society organizations and the private sector at the regional and municipal levels, nongovernmental organizations, university professors and students with a professional interest in spatial regional development.

The methodology was conceived as a guide to microregional development, with an emphasis on the analysis of its main components and interrelationships. It is not, however, intended to be a "manual" as we feel that this would not be the right instrument for attaining the proposed objective. The authors hope that the process of conducting the diagnostic and the use of a GIS will result in the creation of a specific county or microregional data base that could then be used to update it on a regular basis.

The subject matter is organized in the following way. The first chapter focuses on the conceptual and methodological underpinnings of the diagnostic methodology. This is followed by a detailed description of the methodology as such, with conceptual maps being used at the end of each stage of the methodology for greater clarity. Finally, a series of didactic methodological instruments were designed to facilitate training and promote multidisciplinary teamwork.

The authors welcome any observations or suggestions that readers might have regarding the form or substance of this book. We regard input of this kind as extremely valuable, inasmuch as it will make it possible to improve the quality of the next edition.

**Sergio Sepúlveda S. Ph.D.**  
July 1996

# 1

Chapter

## CONCEPTUAL CONSIDERATIONS

## CHAPTER I CONCEPTUAL CONSIDERATIONS

### INTRODUCTION

In Latin America and the Caribbean (LAC), the development of agriculture in general, and of the rural sector in particular, faces new challenges and opportunities as a result of the increasing globalization of the region's economies and trade liberalization.

For decades, LAC has struggled to reduce the size of the poor population in both urban and rural areas. The results achieved thus far have been somewhat disappointing, however, due in part to the excessive centralization of policy decision-making and the spatial concentration of public and private investment in a limited number of medium-sized and large urban centers in some regions within countries. In addition, the economic stabilization policies implemented by most of the countries have drastically reduced public investment in the institutions that provide services to the rural population in the last five years. These two phenomena have produced undesired social impacts, creating higher levels of poverty throughout the economy and, in some cases, actually threatening the stability of the national social system.

In addition, most LAC countries are also undertaking efforts to decentralize the role of government and allow the communities to participate more fully in local and municipal governments. Their aim in doing so is to foster a development process keyed to the needs of the clientele and based on citizen participation, with a view to making more efficient use of public resources and ensuring that they are distributed more equitably among the different social groups and regions of the national territory.

In this context, one of the main challenges facing the LAC countries is the promotion of sustainable economic development based on



the competitiveness of agriculture accompanied by higher levels of social, spatial and ecological equity.

Local governments must be equipped with the management tools to carry out their new political/administrative responsibilities, including instruments to orient the efficient channeling of financial resources towards technically defined investment priorities.

## A CONCEPTUAL OVERVIEW OF SUSTAINABLE RURAL DEVELOPMENT

The spatial vision and territorial management concepts of sustainable rural development underpinning this methodology draw on the principal theoretical and methodological arguments of regional economic development, and are also fed by some elements of modern geographical science. These, in turn, are based on the analysis of spatially located economic and social problems, for which economic and mathematical models might be utilized (Gore 1984). In this context, the major preoccupation of these sciences is the design of policy instruments for spatial development in regions and urban areas, especially those aimed at correcting income imbalances, skewed production growth rates and inefficient transportation systems for the movement of goods. Thus, the overall objective of this type of model is the well-being of national societies. These sciences also pay special attention to the analysis of economic and ecological systems, the creation of negotiating groups (coalitions), and conflict resolution. The latter is an acknowledgement of the fact that the decisions taken by productive agents in specific spatial units are based on more than solely economic considerations.

Within this framework, the market, in the strict sense of the word, is the core element of the conceptual approach presented in this book, with consideration being given to traditional economic elements and special emphasis being placed on the social actors involved. Germane to this proposal are the interfaces between agriculture, the natural resource base and trade, which are duly

emphasized. In this context, the concept adheres to traditional regional development arguments (Boisier 1992), which call for changes within several dimensions (i.e. the socioeconomic, ecological, institutional and political, technological and productive), as well as the interactions among them. Furthermore, in this case there is a shift toward the rational use and management of territorial units (regions and microregions) in order to achieve a long-term perspective of development. In fact, the changes encompass the reallocation of the use of, and access to, the natural resource base; increases in productivity and product diversification; the transfer of political power to local governments; the redistribution of access to decision-making processes and the equitable distribution of employment and income-generating opportunities.

Thus, Sustainable Microregional Development (SMD) is envisioned as a conceptual frame of reference that can be used to orient the design of national rural development strategies, policies and programs. It provides the basis for bringing about changes in the structural and functional causes of spatial and socioeconomic disequilibria, reversing certain undesirable trends and transforming the rural sector with a long-term vision. All this within the context of national development strategies, and linked coherently to domestic and international trade.

## SUSTAINABLE DEVELOPMENT AT THE NATIONAL LEVEL

One of the benchmarks of national sustainable development (SD) efforts is the definition proposed by the Bruntland Commission. In its report, it defined SD as a process designed to "meet the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations 1987). Viewed in this light, economic development and the rational use of environmental resources are inexorably linked. SD is defined as the transformation of the different dimensions or components of the "system of national

society" (Trigo et al. 1991) that entails modifications in the allocation of investments, institutional and political changes, and changes in technologies and informatics that will guarantee the rational use of the environmental resource base to meet the needs and aspirations of all social groups in the present and the future.

From an ecological and ethical perspective, SD is defined as a relationship between the largest and most dynamic ecological systems, which ensure that: a. human life can continue indefinitely; b. human individualities can grow and multiply; c. cultural specificities can survive; and, d. human activities take place within limits that do not endanger the diversity, complexity and functions of the ecological system that is the basis for life (Constanza, R. et al. 1991).

According to the thinking behind the new ecological economics, sustainable development at the national level not only emphasizes the important role of the market as a cause of the inefficient and ineffective use of natural resources, but also recognizes the need for these to be managed efficiently. This definition recognizes the ecological and distributive constraints of the economy and the important role that institutions can play in promoting the rational management of the environment. This approach reflects the importance of economic efficiency in the use of natural resources, but also stresses the distributive aspects of development, both between different generations and different social groups within the same generation.

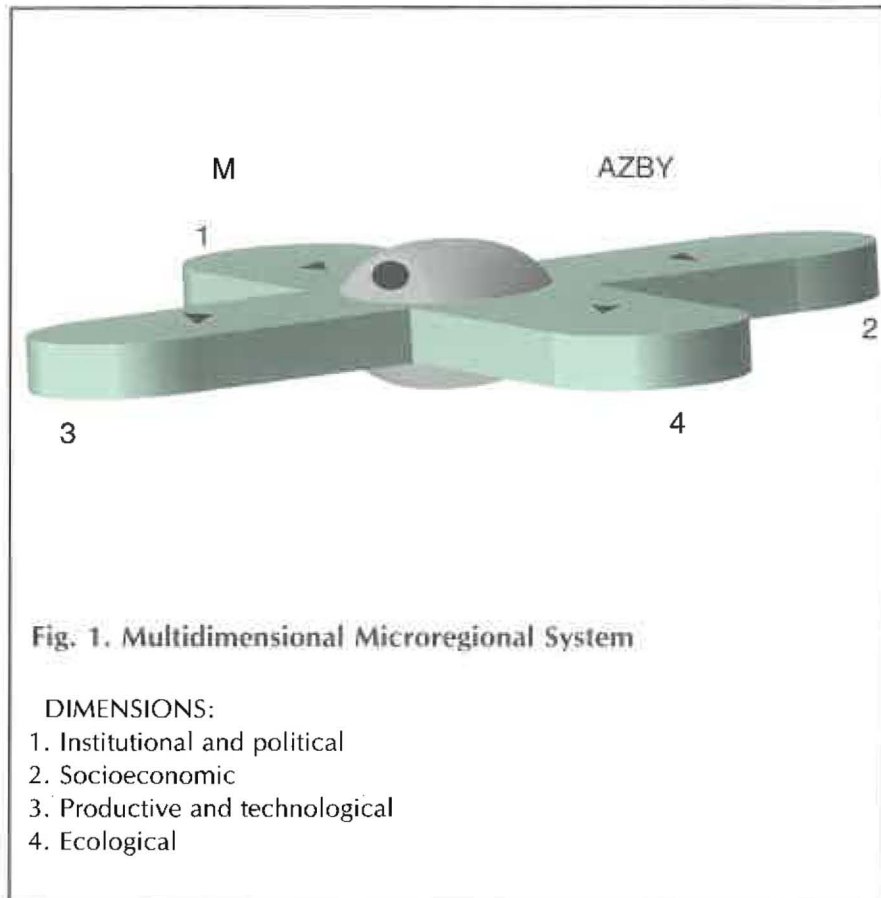
Moreover, at the national level, the sustainable development of agriculture and rural areas is thought of as part of a process that is linked with at least two interfaces: the natural resource base and the environment in general, and trade in particular. In other words, social actors and economic agents make use of the natural resource base and purchase inputs to meet their production needs and offer goods and services to consumers through the intermediation of "markets" and their respective agents. The institutional and legal system of each country provides the superstructure for this entire process and determines the rules of the game.

In the aforementioned context, macroeconomic policy decisions at the national level determine the actual possibilities of promoting concerted and coherent SD activities at the regional and microregional levels.

On the other hand, the SD model affirms that poverty is both a cause and an effect of national structural disequilibria, and argued that attempts to solve environmental problems are bound to fail unless a broader distributive perspective is adopted. Generally speaking, both the rural and urban poor are obliged to make intensive use of the limited natural resources to which they have access and, at the same time, their short-term objectives also lead them to minimize their production costs. Both situations have environmental costs that result in large-scale soil depletion, the contamination of micro-watersheds and water sources, qualitative losses in water supplies, the dumping of contaminating effluents, etc.

In this regard, it is worth reconsidering the arguments of Hollis Chenery and his more modern colleagues, such as Montek S. Ahluwalia, who suggest that to be realistic, the distributive objectives of the benefits of development must go beyond poverty alleviation measures to cover issues that to some extent will affect all strata of society (Ahluwalia 1995).

In short, for development to be sustainable it must be understood as a multidimensional and cross-generational process in which competitiveness, equity and solidarity form a tripod underpinned by ethical, socio-cultural, economic, ecological and institutional/political principles (Fig. 1). This figure represents a microregional system composed of the four dimensions and the interactions that occur within and between them. The space for interaction between the dimensions is represented by the sphere AZBY and is defined, in principle, as the "space for sustainable development"; in other words, in the long run the national system can reach stability only within this space, as shown by point M.



This is the main issue that has yet to be resolved: how to strike a balance between the present allocation of production, consumption, and, therefore, the degree of utilization of the environmental resource base, by different territorial spaces and social groups. This challenge becomes even more difficult when the cross-generational issue is explicitly incorporated. In other words, these same interrelationships must be analyzed with the incorporation of an additional factor -time, the present versus the future- which introduces certain intangible elements into a function that, by definition, is already extremely complex.

Clearly, at the heart of the discussion of SD are people and their cultures, lifestyles and production and consumption patterns. The obvious point of departure for the multidimensional transformation alluded to above is the re-education of human resources at all levels.

Finally, the links between national sustainable development and regional and microregional sustainable development are obvious. In fact, in descending order, each is simply a subset of the former. Thus, SMD is a submatrix of a much broader (national) process that involves national and international factors and actors which determine what occurs at the other two levels (Potter and Richardson 1993).

### **HETEROGENEITY: BASIS FOR A SPATIAL APPROACH**

The prevailing development style in most countries in the region has produced diverse types of effects, often desired and foreseeable, but in some cases quite the opposite. These effects become apparent within different time frames (ranging from a few months to several decades) and affect the patterns of resource allocation, the distribution of the benefits of development and the management of natural resources. In other words, the national development model determines the spatial distribution of economic activities, the territorial concentration of the population, the location and growth of urban centers, and the types of linkages between given territorial units and the rest of the country.

In practice, this phenomenon has given rise to a process of spatial differentiation in which each region takes on specific productive/economic and sociopolitical roles as a functional component of a complex national development matrix. Furthermore, this spatial specificity has led to particular types of linkages between diverse territorial units within a national space. In some cases the relationship between regions is one of interdependence, while in others it entails the dominance of one region over another (Boisier 1994).

The differences between spatial units and the kinds of linkages that exist between regions are highlighted by three characteristics of the socioeconomic and political/institutional system: i) the geographic

concentration of economic activities and the population within a few territorial units and in urban centers that tend to become megalopolises; ii) centralization, within these territorial units, of the institutional system responsible for the decision-making processes; and, iii) extreme disparities in the living conditions of the populations located within different territorial units.

The point of departure for the paradigm of SMD are the differences established within the aforementioned systems. The existing spatial and socioeconomic heterogeneity in the rural sector, the institutional and political diversity of local scenarios and the ecological differences between territorial units, as well as the linkages developed by these units with the rest of the economy, provide the central elements of the diagnostic on which the proposal for sustainable microregional development is based.

The principal elements of this paradigm are designed to alter the main factors responsible for the disequilibria in the socioeconomic, political and ecological dimensions, and also among them. In order to do so, it proposes the use of alternative development scenarios that represent a transition process between the present and the future. As one would expect, each transition process involves a different maturation period and level of investment, keyed to the gap between the present level of development and the future level proposed as the objective.

## CONCEPTUAL DEFINITION

SMD is defined as the process of transforming these territorial units, based on a national strategy and ad hoc policies designed specifically to modify the factors responsible for the spatial, socioeconomic and institutional disequilibria that inhibit the full development of the rural sector and prevent the effective participation of the population in the benefits of growth.

Although this approach recognizes market failures as one of the causes of the irrational use of renewable natural resources, it also

assigns a crucial role to the cross-generational, social and spatial differences imposed by the national development model. Thus, this definition emphasizes the importance of economic efficiency in promoting sustainable development in the rural sector, and also acknowledges the paramount importance of equitable access to the benefits of economic development (A. Ahluwalia 1995).

In this context, the objectives of SMD go far beyond isolated activities and/or projects designed specifically for small farmers. The attainment of these objectives calls for both the transformation of the structural relationships and trends responsible for spatial disequilibria in the rural sector, and the equitable articulation of territorial units excluded from regional and/or national centers of economic development.

Under this approach, the microregion is defined as the basic unit for analyses, planning and actions aimed at achieving sustainable rural development; this unit is defined as the territorial scenario in which historically determined social and economic relationships evolve within easily recognizable borders. This territorial unit is somewhat homogenous in terms of its productive, social and institutional potential and limitations and, for this reason, is an appropriate scenario for allocating resources that will promote its multidimensional transformation.

Thus, the microregion is regarded as the smallest planning space within which activities of different kinds can be executed. These include the protection of strategic natural resources (soils, fresh water sources and the biodiversity of tropical forests and other ecosystems) and the execution of programs aimed at strengthening the productive capabilities of the community and alleviating poverty, among others.

Within the scope of this scenario, it is especially important, in economic and productive terms, to foster the competitiveness of primary productive enterprises and their links with specific production-consumption chains, e.g. agri-food chains. The hypothesis set forth is that the bottlenecks caused by an inadequate physical and

social infrastructure (roads, health centers, telecommunications, applied research on technology, education/training and the limited management capability in the public and private sectors) can best be overcome through microregional organization and planning. This emphasis on competitiveness addresses a key issue: for agriculture and the rural sector to be competitive, the rural population must have access to basic social and production-related services.

Furthermore, focusing on territorial scenarios also makes it possible to incorporate economies of scale with regard to certain productive activities. In this regard, it is worth recalling the reference by Porter (Porter 1990) to the geographical clustering of certain economic activities in order to ensure efficiency through the synergy among activities and skills in the performance of complementary tasks that make up the complex chain between primary production and the marketing of goods and services.

The articulation between production and consumption alluded to earlier even makes it possible to capitalize on certain by-products of the primary production process. Livestock production is a case in point: through the efficient and appropriate use of hides, the value added can be greater than that of the primary product (meat or milk). The most well-documented examples are salmon in Chile, pineapple in Costa Rica, citrus fruits in Brazil, certain vegetables in Guatemala, and flowers in Colombia.

However, from the management standpoint the definition of the analytical and operating unit must be viewed in a pragmatic and flexible way. In some cases, the microregion may cover the physical space of a micro-watershed; in others, a municipality or group of municipalities. It must be kept in mind that the aim in working in these scenarios is to integrate, as far as possible, the political/administrative dimension with natural resource management and the social organization, to ensure that planning activities can be carried out with the full participation of the local population. In short, the aim is to target a territorial unit in which diagnostics can be carried out in order to provide the basis for sustainable development strategies

which will, in turn, serve to orient specific investment programs and projects, as part of a decentralized, participatory planning process coordinated by the local government.

In practice, the purpose of this approach is to provide working instruments for local governments, locating the region's potential and the main bottlenecks or conflicts, in order to design development strategies tailored to the actual conditions that will strengthen the productive base.

## DIMENSIONS OF SUSTAINABLE DEVELOPMENT

The multidimensional approach to sustainable development merely reflects the complexity of the "national system" and of each of the components that one wishes to change in order to transform the rural milieu. Nonetheless, each dimension has its own characteristics and is also influenced by, and influences, the other dimensions. They are presented separately below for didactic purposes. In fact, the interactions between the components of different dimensions can, at a given moment and under certain conditions, be as important as the major components of a specific dimension.

As mentioned earlier, SMD is thought of as having four dimensions that correspond to an equal number of components of the system structuring national societies. Put succinctly, the thinking behind this structure is based on the organization of the societies in question, as well as the mechanisms for articulation among the various groups, in order to carry out the basic activities of production and reproduction (socioeconomic dimension).

In order to ensure that national societies function properly, different institutional and political arrangements have been established to regulate and guide their activities and relationships (institutional/political dimension). This framework of social organization has placed special emphasis on the rules governing productive activities and the use of technology, as a means of guaranteeing the survival of the

population and ensuring the existence of surpluses that make trade possible (productive/technological dimension). All these productive activities use energy and renewable and nonrenewable natural resources as basic inputs, generate consumer goods and/or primary products, and, in most cases, result in negative environmental externalities such as effluents, pollutants, erosion, deforestation, etc. (ecological dimension).

### **a. Socioeconomic Dimension**

The socioeconomic dimension refers not only to the spatial and age distribution of the population but, particularly, to the set of social and economic relationships that are established in a given society, having regard to elements as varied as religion, ethics, and the culture itself. In fact, it is these relationships that in large measure determine the degree of access to the various forms of regional and local power.

Another key facet of this dimension concerns the actors involved in development, with special emphasis on: a) the various ways in which they are organized and participate in decision-making processes; b) the level of organization of different special interest groups that share common needs; and, c) the type and strength of the interactions between civil society and local and regional governments, and other public sector entities. The latter is crucially important for development, and it is based on the premise that the population must take control of its own development process.

In this case, the type and strength of social alliances and the creation of special interest groups are seen as natural mechanisms for gaining access to and exercising power (empowerment), and for conflict resolution. Therefore, social interaction is of crucial importance in promoting and strengthening the process of regional and local participation and democratization.

In microregions, the population grows, develops, changes and interacts through its productive and economic activities. Human

resources are the linchpin of this first dimension as the actors in development. Their capacity to transform themselves and their environment, generate goods, in many cases destroying their natural resource base in the process, places them center stage. The economic aspects of this dimension are, therefore, linked to the capacity and ability of these actors to use and combine the factors of production, in a broad sense, so as to produce specific goods that meet their basic needs and ensure a marketable surplus.

In this context, the degree of development of given territorial spaces is directly linked to two factors in particular: first, to the abilities and skills of the human resources and their actual capacity for generating surpluses and investing them in the same area and, second, to the degree to which the benefits of development are distributed among the different private actors, and between them and the public actors.

Clearly, this dimension and the institutional/political one are closely related, and these linkages are created, primarily, through access to decision-making mechanisms dealing with the allocation of public resources to support the productive and social infrastructure. Thus, it is essential to determine which social group, or how the different groups, negotiate the management of economic and social policy instruments (programs and projects) (Current and Sepulveda 1995) at the level of regional and local entities. This is one of the most important mechanisms for promoting socioeconomic development opportunities.

### **b. Institutional and Political Dimension**

The institutional and political dimension is of particular importance in the process of democratization and citizen participation. It is based on the principle that democracy makes it possible to change the course of development and, therefore, redirect resources toward different activities and social groups.

This dimension takes account of the structure and operation of the political system, be it national, regional or local, the niche where

positions are negotiated and decisions are made about the direction that economic development should take. Furthermore, it is based on a public institutional system that dovetails with the characteristics of the chosen path of development. It is in this dimension, therefore, that the groups and the hegemonic roles of the actors representing the various special interest groups are defined, and different kinds of political equilibria are achieved through negotiations.

As already mentioned, the tangible end result of negotiations of this kind is reflected in the type and amount of resources allocated to different programs, projects and specific works that, in one way or another, will benefit the microregion or region and, to a greater or lesser degree, satisfy the demands and needs of different groups.

Thus, the political and institutional dimension involves the public and private institutional system, non governmental organizations and producers' associations, special interest groups, etc. The decentralization of the public sector, the strengthening of local governments and the renewed emphasis on democratization hold out the prospect of a new role for civil society organizations and, of course, for NGOs. This also calls for a restructuring of the public sector, in a broad sense, and of the channels, instruments and mechanisms for the participation of civil society in decision-making processes.

Regional and local governments and the public sector will continue to play a role in articulating the process and, in cases where the direct participation of civil society is not possible, in promoting actions for sustainable development.

According to the concept of SMD, regional and local spaces become the forum for the negotiation and exchange of the needs and priorities of social groups, with public-sector technical personnel -as a tangible body representing the State- merely acting as the agents of development. Nonetheless, both parties (actors and agents) can be integrated into teams to promote and execute development proposals consistent with the needs of the majority. The rural development

concept does, however, emphasize the microregion as the unit for action. Its successful implementation will only be possible if adjustments are made to the political and institutional system at the national and regional levels: a process of decentralization and the transfer of political power to regional and local governments in an effort to achieve the real empowerment of civil society.

In both cases, the goal is to significantly increase access by fine-tuning mechanisms for political participation by civil society. The above is essential to reinforce the process of strengthening local governments and regional institutions if one wishes to bring about a significant transformation in the style and level of the presence of the central government in each territorial unit. The organized community defines its main problems, identifies the services required to address them, and proposes alternative solutions that it is prepared to co-finance. The government must respond in a systematic fashion to action programs promoted by the organized community.

Furthermore, in this dimension the goal is also to lay the groundwork for the renewal and transformation of the institutional framework as part of the ongoing modernization processes of public sector institutions. In this regard, consideration is given to the role of the public sector and the new roles that the private sector can play, as well as the mechanisms for interaction between them. This concern is part of one of the basic hypotheses: the need to increase the autonomy of the social actors and economic agents, and the management capacity at the microregional and community levels, which is the essence of any development proposal with a long-term vision.

### **c. Productive and Technological Dimension**

This involves the productive capacity and economic potential of the regions and microregions, adopting a multisectoral approach that includes the interfaces between primary and processing and trade activities, and the use of the natural resource base. The first includes all the intermediate activities related to the processing of products linked with specific agri-food chains and, therefore, primary and secondary productive activities in different sectors of the economy.

This dimension involves both specific techniques and technologies, *i.e.* modern inputs and the machinery used in agricultural and forestry production. This dimension also includes the technologies required for the appropriate processing and transportation of products. The aim of the latter is to guarantee the supply of high-quality tradable goods to the final consumer.

In addition, the management capability of the producers is a key component that influences the transition from traditional forms of production to more complex and modern ones. Undoubtedly, the ability to manage production units in an efficient and competitive manner in the wake of drastic changes in both supply (production) and demand (markets) is crucial to ensure the success of the efforts to diversify and modernize agricultural production. Moreover, another important part of this dimension pertains to the economic and productive relationships created in the markets within each territorial unit, and others located in other units which, due to their dimension and presence, might induce transformations in and modifications of traditional productive trends in the microregion.

In this dimension, special attention is paid to so-called superior traditional technologies. In many cases, it is possible to find solutions to certain contradictions caused by cutting-edge technologies and the negative ecological externalities that result from their introduction. Derived from an ancestral body of empirical knowledge, the ecological, practical and economic worth of such technologies is increasingly being recognized. The processes used to identify and retrieve them are therefore being strengthened. Generally speaking, indigenous communities become the focus of such initiatives as they are the custodians of the legacy of basic knowledge for forest management and the use of forest by-products (fibers, foodstuffs, medicines, etc.) that have fewer negative environmental impacts.

#### **d. Ecological Dimension**

This dimension is included based on the premise that the future of development depends on the institutional actors' and economic

agents' ability to understand and manage their natural resource base and the environment with a long-term vision. Thus, special attention is paid to flora and fauna (the basis of biodiversity), and particularly to renewable natural resources, such as soil, water and plant cover (forest), as the factors that in the shorter term determine the productive capability of specific territorial units.

In this context, any productive activity that is promoted must be consistent with a set of parameters that will ensure the rational management of the natural resource base and the environment. This approach assumes special importance, inasmuch as the territorial unit of action for SD and the natural resource base are inexorably linked. Hence, this dimension primarily involves the productive potential of agroecological zones and the analysis of possible conflicts between the actual and potential use of natural resources. This type of analysis endeavors to emphasize the limitations and potential of natural resources in order to ensure their rational and conflict-free management. This approach provides a basis for promoting investment in agriculture and forestry production that maximizes the use of technological processes and clean inputs and minimizes conflicts over the use of natural resources and the generation of toxic effluents.

In this context, the interaction between the economic agents and the environment becomes of paramount importance. It is therefore essential that training be provided for civil society in general and for the representatives of local governments and regional institutions, in order ensure their active involvement in natural resource management. In addition, other elements that become crucial for SD are the role played by the public and private sectors, the mechanisms for interaction between them, and the legal instruments required to promote the rational use of natural resources and the environment.

The dimensions viewed as necessary for SMD are linked to a cohesive set of objectives for any national rural development strategy.

These objectives are as follows:

i. To transform the rural milieu by laying the groundwork for a sustainable development process by:



- strengthening their sociopolitical and economic autonomy;
- improving their linkages with centers of development;
- strengthening linkages between rural and urban areas;
- promoting the rational use of renewable natural resources;
- promoting joint activities of different productive agents;
- facilitating links between the traditional and modern sectors and large, medium and small-scale farmers;
- strengthening the capabilities of public and private actors;
- intensifying linkages between the primary productive sector and complementary activities, such as processing.

ii. To offer a rational and efficient alternative to substantially reduce rural poverty, paving the way for the synergy between social and economic policies to be maximized, based upon the premise that a good economic policy is one that facilitates social engineering.

iii. To foster a modern, decentralized institutional system.

## BASIC ELEMENTS FOR SUSTAINABLE RURAL DEVELOPMENT

The key components for achieving a sustainable rural development process with these characteristics must be designed and executed at the national (macro), regional (meso) and local (micro) levels. The main characteristics at these levels are:

### a. At the national level

- The existence of a strategy and a clear set of specific policies for sustainable rural development with an unclouded long-term vision that is consistent with macro and sectoral policy.
- An institutional, legal and financial framework tailored to the needs of a decentralized administrative plan.

### b. At the regional level

- An appropriate institutional, legal and financial framework.
- Institutional mechanisms for joint public ventures.
- Mechanisms for negotiations between different groups within society, and between these and the public sector.

### c. At the microregional level

- The strengthening of the technical, administrative and financial capabilities of local governments in order to ensure its modern and efficient management, within public sector schemes.
- The functional articulation of the regions and microregions to the regional and national economic and political system, with a long-term vision and on equitable and sustainable bases. Agricultural and non-agricultural productive activities are used as the triggering mechanism, with a spatial coverage that incorporates and strengthens rural-urban articulations.
- The strengthening of mechanisms and instruments that ensure equitable access to ownership of production resources and to production support services.
- Increased opportunities for the rural population to improve its skills and ability to manage the political, economic and financial aspects of its own development.

## PRINCIPAL THEORETICAL ELEMENTS

As has already been established, sustainable development calls for sweeping structural change, including adjustments to the very *modus vivendi* of modern society. In other words, production, consumption and distribution patterns must be changed. (H. Daly 1991).

Therefore, setting national societies on the road to sustainable development involves the negotiation of new agendas for action in areas as diverse as the social, economic, political and institutional dimensions. This chapter concludes with the presentation of a set of theoretical definitions that are implicit in, and serve as the basis for,

both the conceptual framework that has already been presented and the diagnostic methodology that follows. They also complement the extensive treatment that SMD has received.

### Planning of microregional sustainable development

This is a participatory process, the objective of which is to transform the various dimensions of the scenario used as the unit for action, over a period longer than a decade. This temporal profile is necessary as sustainable development and productive, organizational and political transformation are, by definition, lengthy processes.

The starting point for the microregional planning process is the diagnostic depicting the situation in the scenario observed at a specific point in the past (T0) (1980), and its evolution up to the present (T1). This is the main purpose of the diagnostic: to evaluate the present situation from a retrospective view. The diagnostic also provides the bases for generating the prospective image (or target image, as the case may be) of the microregion within a specific period of time (T2). Based on these elements, it is possible to proceed to the second phase of the microregional planning process: the formulation of the SMD strategy, which will subsequently be complemented with other stages in the process, such as the ranking of investments in order of importance, the execution of projects, etc.

### Trade-offs

The trade-offs paradigm refers to a decrease in the availability of a given product or factor if one wishes to have more of another product that is not complementary.

Let us take the case of economies that have a limited amount of natural capital and a specific standard of living, as represented in Diagram 1. The only way in which the population can attain a higher standard of living than at present is by reducing its stock of natural capital. This is an issue that has to be addressed every day - the need to make trade-offs between the standard of living (a product

composed of access to education, health services, work, income, etc.) and the stock of natural capital (renewable and non-renewable natural resources and the environment), the other product in question. The function  $C_{min}W$  represents a country's chosen path of development. If its objective is to achieve a higher standard of living, it must reduce the availability of natural capital. Conversely, the only way in which a country can have a larger and better stock of natural capital is by adopting production and consumption patterns that result in a decline in the standard of living, all other factors remaining constant. In other words, in most cases the alternatives for trade-offs between the standard of living (SL) and natural capital (NC) entail a movement along the line E-D.

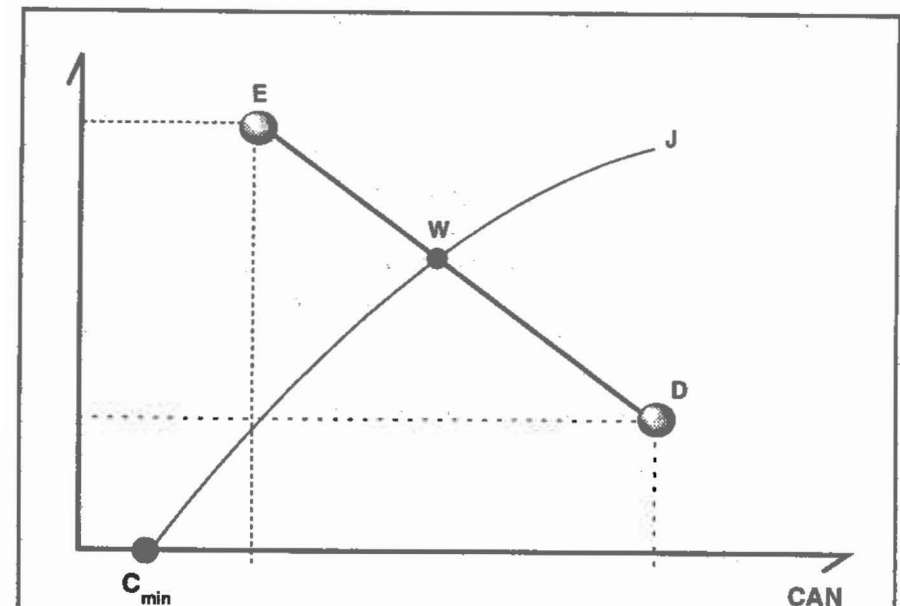


Diagram No. 1. Trade-offs paradigm

Source: Pierce and Turner p. 46 adapted and simplified

## Externalities

A basic concept of economic theory, this implies that some of the benefits or costs of a productive process are external to the agent of the action. In other words, some of the costs or benefits are borne by individuals not involved in the process that produces them. For example, logging in the upper reaches of a watershed will produce direct benefits for those who cut down and sell the trees, and negative externalities (erosion and sedimentation) in the middle and lower reaches of same watershed for other economic agents. Conversely, the reforestation of the upper reaches of a watershed will produce positive externalities for the population living in the lower reaches. (Maynard, M. Hufschmidt et al. 1983)

It is argued that the way to deal with effects of this kind is by "internalizing the externalities," that is, including them in economic calculations so that decisions are made based on all the available information on the productive processes involved.

Although this term is usually applied to economic factors, its meaning is expanded in this methodology to include the social effects of specific macroeconomic policies and actions by the public sector. Social externalities may be either positive or negative, depending on the nature and level of the impact on specific social groups. The most tangible example of effects of this kind is the implementation of structural adjustment policies and, more recently, trade liberalization. In both cases there have been winners and losers. The losers include the people who have swelled the ranks of the unemployed, and the large number of small urban and rural enterprises that have been forced into bankruptcy.

## The Long Term

Sustainable development is, by nature, a long-term process. Most of the changes that may be proposed in the social (human resources), ecological (natural resources and the environment), political-institutional (legal and political framework) and economic (productive) dimensions will call for maturation periods of over a decade and, in

some cases, of up to a generation. In the case of some productive activities with slow-growing forest species, the maturation period can actually be more than 25 years (Current and Sepulveda 1995).

For our analysis, we have adopted a time frame of 15-20 years as "the long term." However, this should be regarded as a flexible definition, since the time required for the maturation of the different processes in question can vary considerably.

## Scenario

In this case, the term "scenario" is used to emphasize the spatial characteristic of sustainable development and the definition of the minimum unit for action: the microregion. The four dimensions of SMD and the interactions between them are easily recognizable in this space, as are the interrelationships between different actors and factors within each of them. Figures 2, 3 and 4 below clearly demonstrate this characteristic and the change that takes place in the scenario over time, using a retrospective, present and prospective image, respectively, of the same territorial unit.

The microregional scenario is regarded as a functional political and administrative unit and, as such, a natural space that facilitates:

- The practical application of a holistic approach to development.
- The analysis and design of instruments that entail specific actions designed to address issues related to the well-being of rural society.
- The strengthening of the democratization process through the increased participation of civil society organizations in the management of smaller territorial units.
- The empowerment of local and regional governments.
- The analysis of the interaction between people and the environment.
- The integration of interagency action at the local level.
- The planning and execution of activities involving the four key areas: the economic, social, institutional and ecological dimensions.
- The execution of actions articulated at the level of the microregion and of productive units.
- The focusing of actions on specific clienteles or problems.

Figure  
N° 2

### Multidimensional Scenario

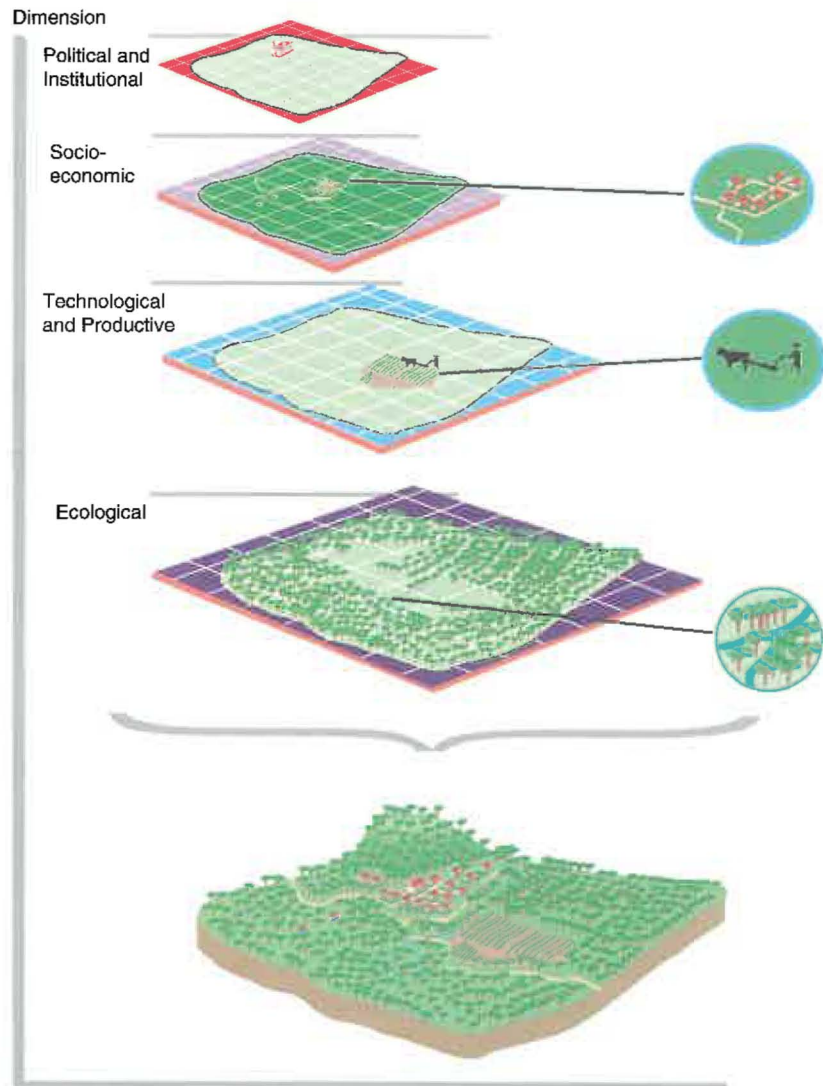


Figure  
N° 3

### Multidimensional Scenario

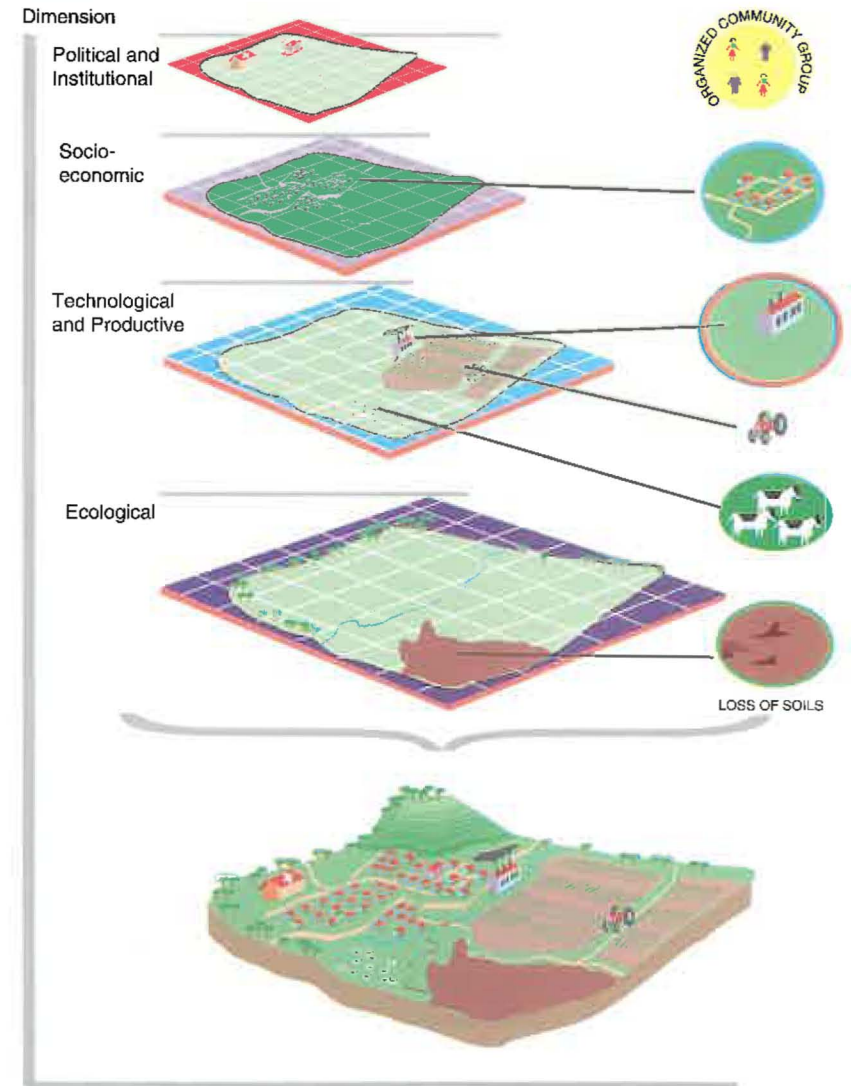


Figure  
Nº 4

### Multidimensional Scenario

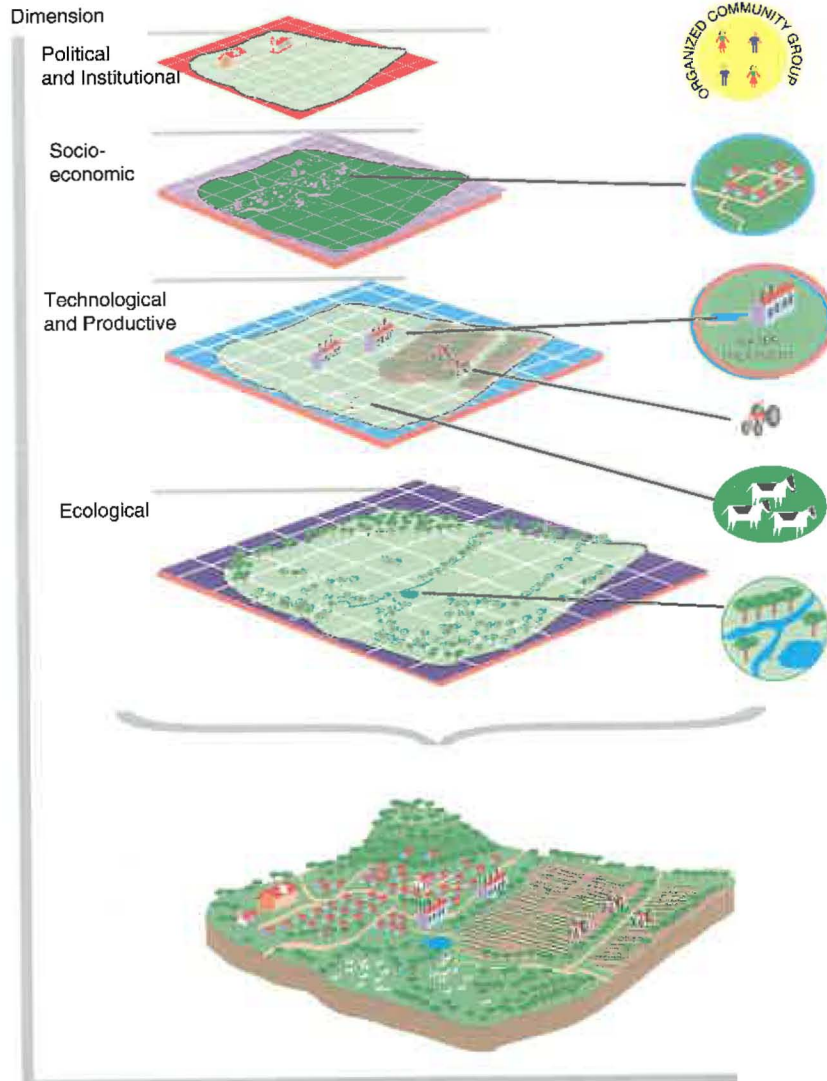


Image # 1: Prospective

### Trends

An analysis of trends is necessary to evaluate the temporal dynamics of the four dimensions of the sustainable development process. In this methodology, the term trends is used to refer specifically to a linear extrapolation between the observed values (or qualitative appraisal) of a variable, a set of variables, or a specific phenomenon at two or more different points in time. Only in very special cases and for didactic purposes is it used to refer to an econometric estimate, as in Diagrams A, B and C. In diagram A, the example used is the increasing rate of deforestation (indicator) for a similar period. Provided that all other factors remain constant, the projection of this rate suggests that it will reach 30,000 hectares by the year 2010.

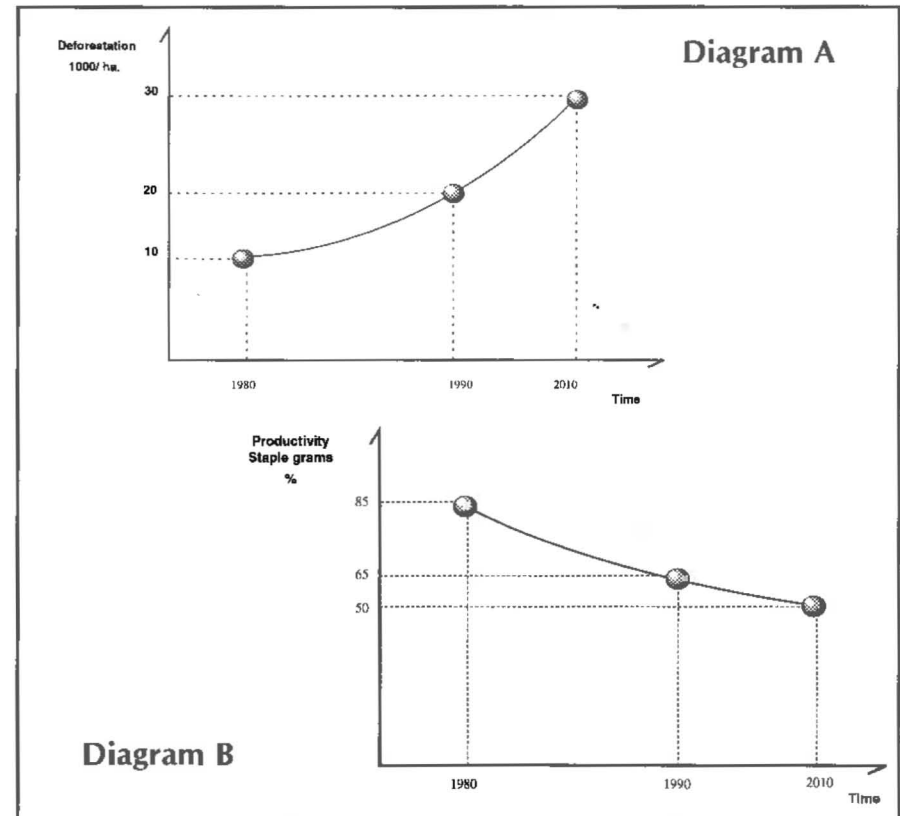
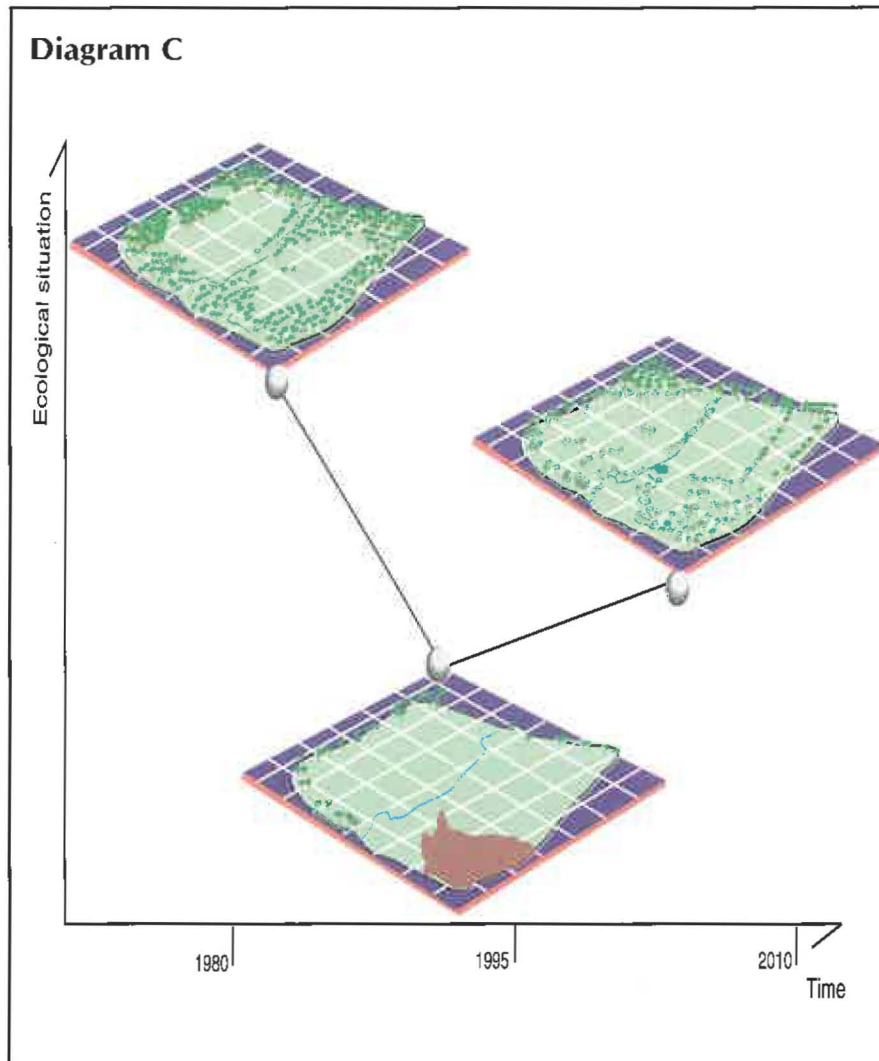


Diagram B shows the drastic fall in the productivity of staple grains (variable), from 85% to 65%, over the decade 1980-1990. The linear extrapolation suggests a further decline, to 50%, by the year 2010. The same periods are presented in Diagram C, which shows us the critical ecological deterioration in the first decade, and the positive changes that are expected to be achieved by the year 2010.



### Pareto optimum

This economic criterion makes it possible to classify certain situations as preferable to others. Put simply, a specific situation is defined as "Pareto optimum" when, in order to improve the conditions of any of the individuals involved in it, those of someone else must decline. This is something of a truism: any individual would prefer to be better, rather than worse, off. This criterion is important because it has become the theoretical justification for interventions by the public sector in situations where weaknesses in the operation of the market lead to results that are not Pareto optimum. (Pierce and Turner 1991).

### First Law of Thermodynamics

The view of the planet, or any other space, as a closed system has crucial theoretical and practical implications for the elucidation of sustainable development. These are summed up in the first law of thermodynamics: energy can be neither created nor destroyed. This in turn means that the flow of materials (inputs) from the environment that are incorporated into the economic system is destined to either accumulate within the economic system or return to the environment in the form of waste. Once the accumulation reaches its maximum limit, the entire volume of material that enters the economic system is equal to that which is expelled into the environment (Tietenberg 1992). At its maximum limit, the volume of waste becomes a problem in terms of the depreciation of the stock of natural resources, land, air, forest mass, water, etc., as these recipients lose their intrinsic quality and, therefore, their use value. For example, air pollution causes respiratory problems, water contaminated with metals or chemicals can be cancerogenic, deforestation can affect the quality of drinking water or water for irrigation, etc.

### Second Law of Thermodynamics. Entropy

The relationship between human beings and the environment is also determined by the second law of thermodynamics, known as the

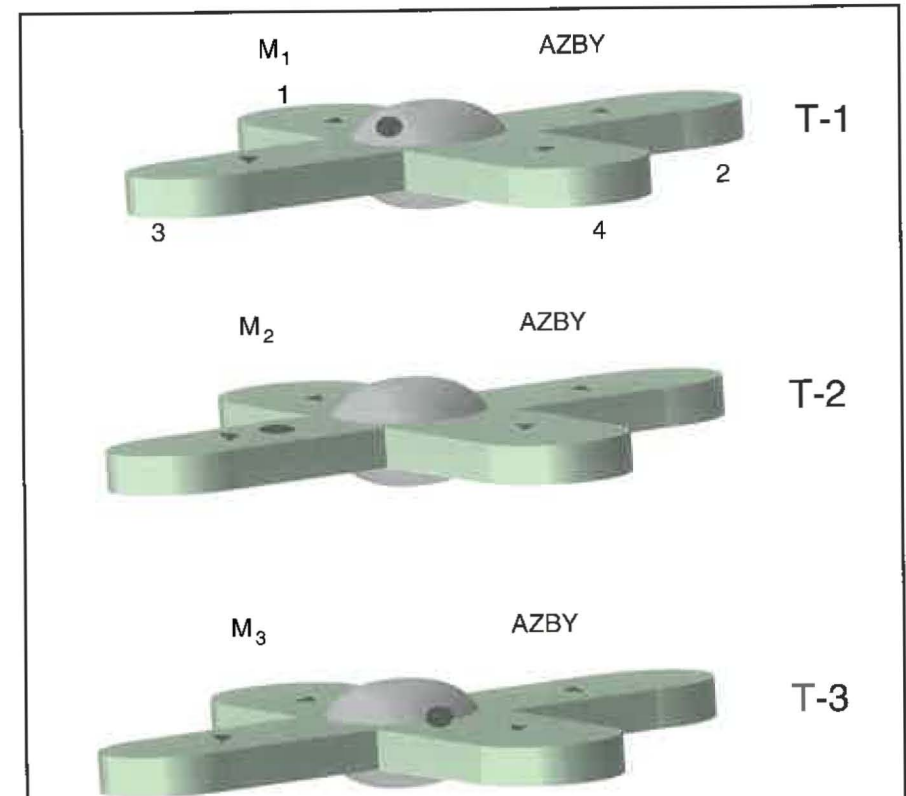
Law of Entropy, which concerns the transfer of energy and the irreversibility of the process. In other words, some energy is always lost during the conversion process, and the rest, once used, cannot be re-used. The implications for sustainable development are obvious: if our societies function within a closed system and no new energy sources are available, its life depends on it and, once the existing supply of energy is used up, our societies will perish. However, the flow of solar energy opens up our system to an exogenous source that significantly increases the possibilities of growth and life and raises the maximum limit. The level of use will depend on our capacity to harness and make efficient use of the energy in question. In the very long term, therefore, the development process would be limited by the availability of solar energy and our capacity to harness it effectively.

### Microregional System

Figure 5 shows a microregional system composed of four dimensions in a state of stable equilibrium at points  $M_1$ ,  $M_2$ , and  $M_3$ , at three different moments in time (T-1, T-2 and T-3), within the space AZBY. The system is viable and can reproduce itself and be projected into the future as long as all the dimensions (institutional and political, socioeconomic, productive and technological, and ecological—represented by the numbers 1, 2, 3 and 4 in the figure) remain in a stable balance within AZBY. Only within this space can development be sustainable for sufficiently lengthy periods of time. However, the system may temporarily (for varying periods of time) be in a state of disequilibrium because an over-emphasis on one or more dimensions causes point  $M$  to move outside AZBY. In that case, the distance that separates the point of equilibrium from the limit of space AZBY will become the degree of conflict faced by the system. However, if mechanisms exist within the system for negotiating the return of the destabilized dimension to a state of partial equilibrium, the system as a whole will return to a state of stability and follow the path of sustainable development.

However, if two or more of the dimensions are unstable for sufficiently lengthy periods of time, thus making it impossible for the

system to return to a stable condition, it is likely that the system is moving along a path of non-sustainable development, and may even have passed the point of no return. In other words, in this case the vital signs of the system in each and every dimension point to irreconcilable social, political and ecological conflicts.



**Figure 5.**

*This diagram underscores the dynamic and cross-generational nature of SD (space and time) and the constant changes that occur in the partial equilibria of each dimension, and the stability of the equilibrium of the entire system. This is the result of the interactions between a multiplicity of factors within each dimension, and between the dimensions. Moreover, as it is an open system, it is also exposed to exogenous factors originating in other regions or countries that determine the possibilities of development.*

Providing systemic solutions to the problems of spatial development calls for the harmonious, fluid and practical inclusion of complementary actions in several dimensions. Any development proposal aimed at improving the rural milieu must rationally combine the activities of the primary sector with actions managed by other sectors of the economy.

### Note on Geographic Information System

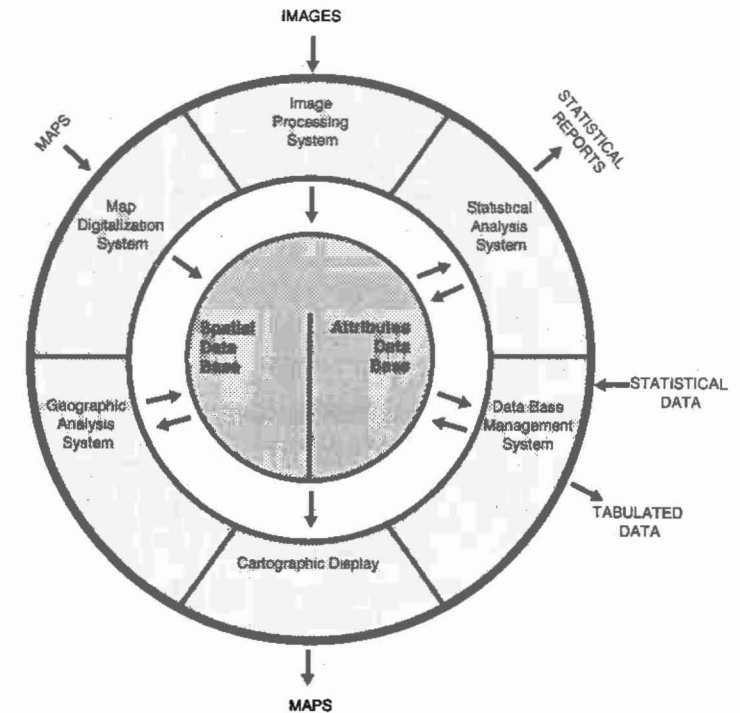
A Geographic Information System (GIS) is a computerized instrument used to gather and manage georeferenced information and represent it on maps.

A detailed definition (Antenucci et al 1991) that makes it easier to visualize the instrument in question is: a GIS is any computerized data management system that makes it possible to:

- gather, store and retrieve geographically located information;
- identify specific locations in a given scenario;
- determine relationships between sets of information in a specific scenario;
- analyze the spatially related information as the basis for decision making with regard to the management of the space in question;
- facilitate the generation of information that can also be used in models for the evaluation of the impacts of policy instruments on the territorial units analyzed;
- show, exhibit and design, in figures and numbers, the scenario analyzed.

A GIS is composed of a set of components, as presented in Figure 6 (Eastman 1995). In addition to the data base, these are a set of systems that make it possible to integrate the work, including:

- Cartographic display.
- Digitalization of maps.
- Data base management.
- Geographic analysis.



- Image processing.
- Statistical analysis.
- Support for decision making.

A number of GIS programs have appeared on the market in recent years. These vary in their complexity and capacity to handle data and create and display maps of varying levels of intricacy and scale. However, IDRISI has proven to be an inexpensive, simple, user-friendly teaching tool for managing the kind of information required by local governments.

It is important to remember that the ultimate objective of the design and implementation of an information system is the ability to properly organize the information and update it on a permanent basis. The decision to design an information system must be followed up with the allocation of financial and technical resources to keep it



up-to-date and generate analyzed, easy-to-read information for the management of the local government concerned.

Local governments could improve the efficiency of their management considerably if they were to use a GIS tailored to their basic needs, as a municipality is an interdependent system of individuals, institutions, services, etc., connected geographically. An information system undoubtedly makes it possible to substantially enhance the quality, accuracy, ease of access and timeliness of the information used by local governments. This would help both the public and the private sectors to carry out their activities efficiently. For a local government, a GIS can be much more than a data base used to conduct a diagnostic and subsequently design a sustainable development strategy. The management of other routine local governments activities could be facilitated through the use of a GIS, such as: a) the monitoring and evaluation of the economic, social and ecological impact of projects and other activities executed within their space; b) the provision of information for estimating land taxes; c) the cadastre of urban and rural property; d) town planning and urban/rural zoning; e) the efficient design of transportation and communications systems; f) the locating of public services in accordance with the spatiality of the demand; g) the design of social programs for specific spatial units keyed to the location of the clientele; h) the design of maps for managing production support services, (e.g., technology transfer).

Computerized systems using PCs are now readily available. This opens up new opportunities for using GIS on an increasingly smaller scale, as in the case of local governments. It is also worth noting that in the case of municipalities with limited financial and technical capabilities, it is possible to design systems for consortia of institutions whose activities are carried out within a geographical perimeter similar to that of the municipality. A university, technical college or secondary school with an important role in the area could be used as the center of operations, and the rest of the system built around it so as to achieve multiple objectives. Furthermore, the presence of the GIS in an educational institution of this kind could facilitate the training of human resources to address the demand for specialized manpower.

However, it should be borne in mind that the potential of the GIS can only be fully realized if the necessary political, technological and organizational changes are instituted. Indeed, the training of human resources with a clear vision of the many uses that this technology can have is one of the factors that has received least attention.



2

Chapter



METHODOLOGICAL ELEMENTS FOR  
THE DIAGNOSTIC

## CHAPTER II METHODOLOGICAL ELEMENTS FOR THE DIAGNOSTIC

### THE DIAGNOSTIC: THE FIRST STAGE IN THE SMD PLANNING PROCESS

Microregional participatory planning (MPP) is a process composed of several complementary stages. However, for didactic purposes it is difficult to draw anything other than arbitrary distinctions between them. As already mentioned, the first stage in the MPP process is the diagnostic. As this progresses, the participation of different interest groups and communication between them become increasingly important. Hence the process is defined as cyclical, inasmuch as its execution calls for an ongoing exchange and feedback among the agents (the technical staff of public institutions) and the social actors/economic agents living in the microregion.

Figure 7 shows the vital importance of participation and communication in the different stages of the MPP process (Carew-Reid, J. 1995), including monitoring and evaluation. Participation and two-way communication must be a permanent feature of the process, beginning with the diagnostic.

The four phases of the diagnostic are as follows:

- i. The first phase consists basically of holding consultations and preparing for action.
- ii. The purpose of the next phase is to prove the hypothesis of the existence of the microregion; the activities focus on the precise delimitation of the unit to be used for planning and action.
- iii. The third entails the interpretation of the internal dynamics of the microregion, complemented with a specific analysis of each dimension and its main trends.
- iv. The final phase of the diagnostic is the design of the prospective scenario (vision) of the microregion.

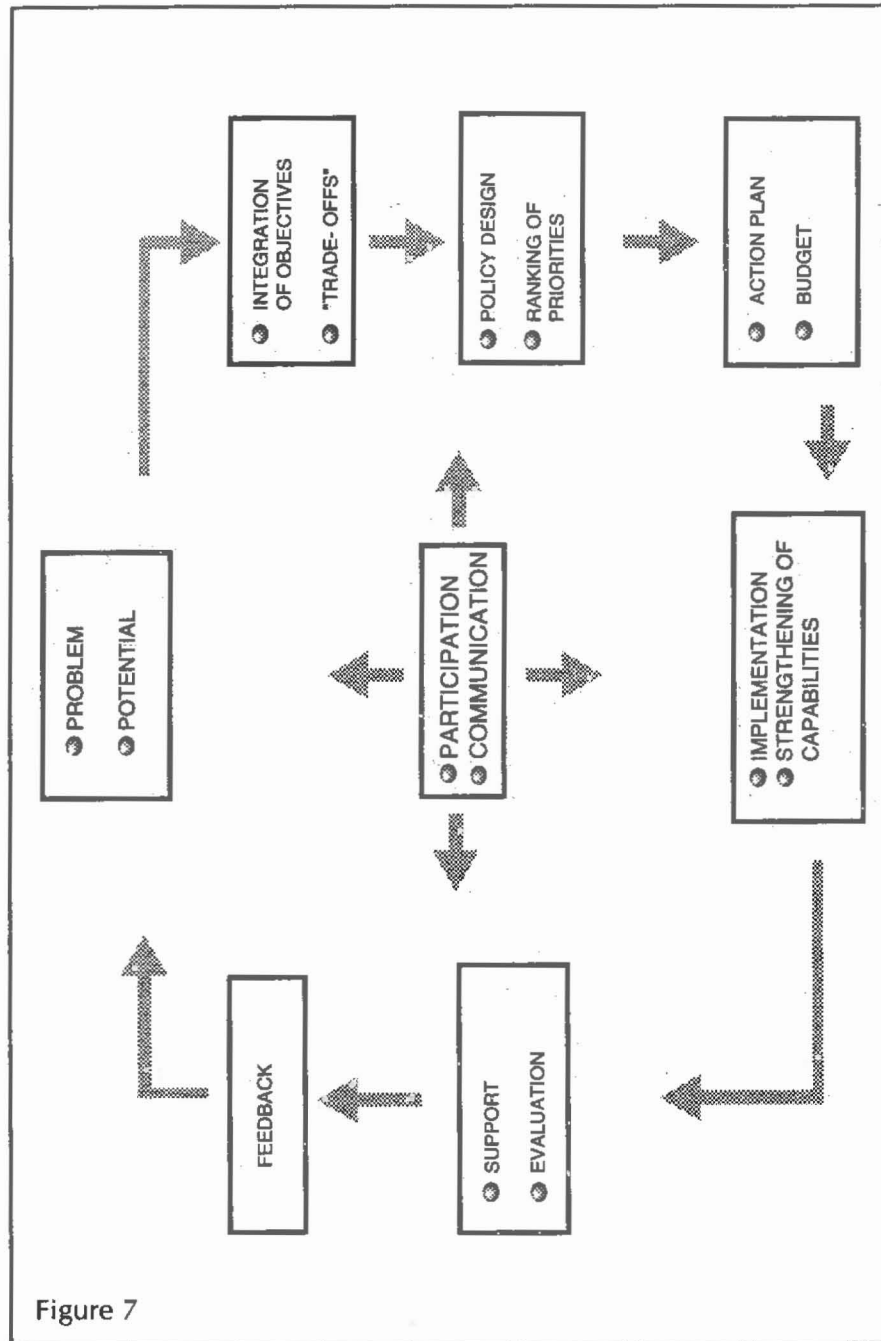


Figure 7

## PHASE I

### Preparing for action

The aim in this phase is to define the scope (content and depth of the analysis<sup>1</sup> of the work that is to be carried out and the responsibilities of each of the public and private entities involved. This is the first space in which the groups interested in the diagnostic negotiate and share their needs, and should therefore be used creatively. The tangible result of this phase is an agreement of some kind between the regional and municipal authorities and representatives of civil society to work together effectively.

### Defining the needs of the diagnostic

Work of this kind has become an important part of the new functions and activities assigned to local governments as a result of the decentralization of the state. For this reason it is felt that the local council(s) within a given microregion should be the one(s) to take the initiative in proposing the formulation of diagnostics. In this case, the initiative can also originate with civil society organizations, which initiate a negotiating process and request that the work be carried out to guide the actions of their territorial unit, rationalize the use of its resources, promote and provide an attractive and secure setting for private investment, and guarantee the transformation of the microregion.

The basic procedure for securing official approval for the diagnostic should involve as few formalities as possible, so that the process is expedite, simple, useful and easy to execute. However, since several (public or private) institutions are likely to be involved in its execution, the proposal should define the scope of the diagnostic (e.g. the

<sup>1</sup> The depth of the analysis and the precise treatment of specific topics (e.g. natural resources, demographic structure, land tenure, levels of unemployment) must be clearly identified. It should be borne in mind that this methodology is sufficiently user-friendly and flexible to meet a variety of needs.

geographical area that is to be covered, the objectives, the level and depth of the work, the approximate time available for each part of the diagnostic, etc.). The official request could also suggest possible funding sources to complement those that already exist, outline the technical and administrative responsibilities of each participant and include a plan and schedule of activities.

Given the nature of the work, a variety of funding sources may be used for the diagnostic. Most of the resources, however, should be allocated from the ordinary budgets of the local government and the principal public institutions working in the microregion. In special cases where regular budget appropriations are inadequate, it is essential that funding be sought from national or international agencies to complement local resources.

It is recommended that suitable personnel from the NGOs and universities (students and professors) in the vicinity of the microregion be involved, as they can subsequently give continuity to the process of strengthening the local government and civil society organizations through: a) the training of their personnel; b) support in managing and updating the information system (and, of course, the database) that is set up as a by-product of the diagnostic; c) further studies on specific topics; d) practical training that will enable them to subsequently participate in the execution of specific activities, components or projects.

However, if the local government enjoys only limited autonomy, it may have to inform the corresponding central government entity (e.g. the national planning authority) of the obligations it has assumed and the organizations involved in carrying out the work. On the other hand, if the local government has sufficient powers, the team can set to work as soon as the application has been approved, appointing a small advisory group headed by the municipal council or its equivalent, whose function is to serve as a sounding board to fine-tune the proposal.

### **Selection of the technical working team**

Once the funding sources have been determined, the next step is to set up a multidisciplinary team composed of no more than seven people, drawn primarily from institutions with a regional/local office. Ideally the team should be composed of a geographer, an economist, a sociologist, a natural resource management specialist (or an ecologist) and an agronomist. The group of professionals should preferably have practical experience in agricultural and rural development.

### **Training event to present the methodology and objectives of the work**

The team's first task is to discuss and give thought to the objectives of the work and evaluate and adapt the methodology that is to be used. To do this, it is recommended that the group participate in a training event designed especially for this purpose. As part of this exercise, the team should draw up a schedule of the detailed activities involved in each task that is to be executed, the expected outputs, the time frame involved, and the person directly responsible. It should be noted that the proposed methodology is conceived in such a way that, working full-time, the diagnostic can be completed within two months.

### **Reconnaissance of the microregion**

In order to gain a better understanding of the unit that is to be studied and fine-tune the scope of the work, it is recommended that three complementary activities be carried out to gather the quantitative and qualitative information for the four dimensions already mentioned, at the different points in time.

### **Organization of the secondary information on the microregion**

The rapid and complete organization of the information available on the target area of the study can greatly facilitate the execution of the subsequent activities (analyses). It is recommended that the following steps be taken for this purpose:

- Creation of an inventory of the existing information on the microregion, classified according to the four dimensions of SMD.
- Selection of a simple geographic information system (GIS) that meets the needs of the study, the financial resources that the local government has available, and the multidisciplinary composition of the working team.

Although the diagnostic can be carried out in the traditional way, i.e. without using a geographic information system (GIS), there is no question that using one will also contribute to the efficient management of the municipal government. A data base is created and a tailor-made, easy-to-update information management system is put in place. The use of a GIS makes it possible to combine and compare the information selected for specific areas or geographic spaces with certain attributes, such as plant cover, topography, land ownership, forms of organization of production, schools, health centers, etc. The management and analysis of this information will also make it possible to compare the situation in different microregions.

Furthermore, at the municipal level this system can also be used to facilitate the monitoring and evaluation of an SD strategy, and the systematic, prioritized and focused allocation of resources to plans of action and complementary projects. The adoption of the GIS by the municipal government should therefore be regarded as the first step in its management modernization process.

Viewed in this light, a GIS is probably one of the most appropriate tools for carrying out the type of work proposed in this methodology, since it makes it possible to solve development problems from a spatial and temporal perspective.

In simple terms, this information system is a computerized instrument used to store, manage and retrieve geographically referenced data with specific attributes, based on the use of software programs designed especially for this purpose. Spatially referenced information is generally presented in the form of maps. The use of a GIS offers many

advantages, not least the fact that different maps can be combined, overlaying them to obtain a composite image of several attributes.<sup>2</sup>

Geographic information systems cannot manage a large number of variables or a great deal of detail, nor generate maps that superimpose more than four attributes. Nonetheless, a program of this kind used to validate this methodology in Chile and Peru produced excellent results. Although the digitalization of the information for some maps took longer than expected, once the work had been done it became a relatively simple matter to update and further develop the analysis. In the case of Purranque (Chile), the database and the GIS were adopted as instruments for expediting the municipal management process.

### Reconnaissance visit to the microregion

Shortly after the team has been set up, all its members should familiarize themselves with the microregion, especially those whose working experience was acquired elsewhere. The purpose in making this visit is to:

- Fine-tune the mechanisms for the effective participation of local officials and community leaders in the execution of the tasks in question.
- Make an initial effort to analyze the hypothesis of the existence of the microregion and the possibility of generating a proposal that could feasibly be implemented.
- Begin to gather secondary information.
- Identify the main projects already under execution that cover the four dimensions already discussed.
- Ascertain the main areas in which unmet needs exist.

### Preliminary definition of the limits of the microregion

This definition must be based on a sight analysis in order to verify the hypothesis of its existence and determine its physical boundaries

<sup>2</sup> For further information, see R. Edwards and S. Sepulveda (1996): "Desarrollo sostenible: Introduccion al uso de SIG para la planificacion microregional." IICA, Coronado, Costa Rica. This document, which is intended to complement the microregional sustainable diagnostic methodology, presents the minimum technical elements required to familiarize the reader with the subject, plus an extensive list of applied bibliographic references.

as a first approximation. If the microregion coincides with a political-administrative unit with clearly established territorial limits, the task consists merely of marking on a map the boundaries of the existing unit. However, this activity is especially important in those cases where the microregion has no pre-established political or administrative boundaries.

If the country in question does not have clearly defined microregions or if, in the team's view, the microregional space officially selected does not coincide with the existing territorial jurisdiction(s), based on its own knowledge and by way of a preliminary hypothesis, the team should mark the probable boundaries of the microregion on the map.

This initial hypothesis should be verified and adjusted based on the information obtained from an array of informants selected from the public and private sectors who are familiar with the region. If the team does not have first-hand knowledge of the spatial unit in question, it is essential that it visit the entire microregion or at least its most representative spaces. This experience is extremely useful, as it presents empirical information that is rarely systematized. The team obtains a general idea about the conditions in the microregion, based on its physical boundaries, but is not yet in a position to confirm the existence of the microregion as a socioeconomic and geographic unit.

### **Contacts with regional or national officials**

It is recommended that structured interviews be held with the specific public officials responsible for municipal management, agricultural or rural development, poverty alleviation programs and natural resource management, and with others who could be instrumental in promoting the development of the microregion. The general objective of these discussions is to obtain information on the official criteria used to chart the objectives and goals of national, regional and local development, and the global priorities established for the region, the existence of projects and ongoing actions.

Advantage should also be taken of these consultations to gain an understanding of the regional and microregional vision of the persons interviewed. These contacts should, of course, include a select group of representatives of the private sector and NGOs. These meetings will produce two tangible results: firstly, the vision that the professionals interviewed have of the microregion; and, secondly, qualitative information and ideas on the subject that the team will be able to use as input for conducting a more complete diagnostic.

Furthermore, these contacts will facilitate access to key documents, such as the National Development Plan, in which information and proposals for regional development are presented and discussed. Access to such documents will undoubtedly maximize the possibilities of harmonizing the proposals that they contain and those that emerge from the diagnostic. It is therefore advisable that information be obtained from the national planning agency and/or the entity responsible for regional and local statistics on social and economic indicators and the infrastructure (national and by region), in order to determine the relative position of the microregion vis-a-vis the rest of the country; this information will make it possible to determine the dimensions in which the microregion fares best or worst in relation to the national average and other regions. This in turn will facilitate the ranking of the microregion's problems and needs in order of importance, and its relative potential.

## **PHASE II**

### **Characterization of the microregion**

The primary objective of this second phase of the diagnostic is to verify the existence of the microregion, characterize it in terms of the four specific dimensions, and define its boundaries. To accomplish this, it is necessary to: a) define the scope of the analysis that is to be carried out; b) gather the relevant information; and, c) process and analyze the information. In the last case, the aim should be to identify the principal relationships among the most important variables in each dimension, and among dimensions, that affect or determine the

level and intensity of spatial development. This level of analysis should also be used to determine the microregion, the most conspicuous needs, as well as its potential.

This work calls for the use of various techniques for gathering, storing and analyzing information, and of statistical methods for calculating and projecting the economic, social and ecological variables that one wishes to emphasize<sup>3</sup>. It also entails the preparation of maps containing information of different kinds, the production of information summaries, and efforts to obtain the views of different social and political agents.

### Training and planning workshop

Once the working team has been set up, the area of the microregion provisionally selected, the secondary information gathered, the data base set up and the work plan defined in detail, the team is ready to begin the field work as such.

The first step is to hold a workshop within the microregion, designed specifically and primarily for the purpose of fine-tuning the methodological aspects and the analytical instruments to be used.

## CHARACTERIZATION OF THE MICROREGION

The following is a description of the minimum information and analyses required to characterize the microregion and verify the working hypothesis.

### Economic and social policy framework

The team must draw up a short but accurate list of the principal economic, social, ecological and decentralization policies that are

<sup>3</sup> The type of methodology presented in this book does not attempt to include every possible analytical instrument, as this would make it an impractical tool. It is assumed that the average trained professional already possesses the basic analytical expertise for conducting the type of analysis required. This document therefore includes a limited set of calculation tools.

being implemented in each country. It should also examine the principal policies in some other sector (i.e. the transportation infrastructure), which by their very nature are regarded as important conditioning factors for the development of the microregional economy and the living conditions of the rural population.

It must be remembered that the overall policy framework in LAC countries is determined by economic programs aimed primarily at solving balance of payments problems. This has resulted in greater productive specialization in order to increase exports, and a bias towards the use of capital- and natural resource-intensive technologies. These policies have bridled the execution of coherent productive reconversion programs, and resulted in declining education and health services and a slowdown in investment in the transportation infrastructure, among others. However, in recent years this trend has begun to be reversed as a result of the serious and widespread problem of urban and rural poverty faced by most countries. In consequence, both the countries and the multilateral funding agencies are once again turning their attention to poverty alleviation programs.

These comments are intended to underscore the importance that macroeconomic policies have assumed as a conditioning factor in any local development proposal; thus, they must therefore be carefully evaluated when analyzing the potential of the microregion.

Finally, the team must analyze national rural development policies and programs, inasmuch as they establish the most immediate frame of reference for defining policies, programs and projects at the microregional level. This set of policies should not merely be characterized but analyzed and digested, with an emphasis on the conditioning factors and the potential effects of their implementation.

### Spatial analysis of the microregion

#### a. Preparatory activities

Based on the preliminary delimitation, the team proceeds to fine-tune its hypothesis vis-a-vis the actual territorial composition of the



microregion and to gain a greater understanding of its renewable and non-renewable natural resource base<sup>4</sup> the productive, socioeconomic and institutional characteristics of the microregion, and their inter-relationships.

In doing so, it draws on the secondary information on the preestablished dimensions already compiled; it also fine-tunes the design of the database to meet the needs defined by the team.

At this point it is essential to pause and evaluate the compatibility between the analytical framework that was originally proposed, the availability of the relevant information, the team's technical ability to handle and analyze it, and the actual time available for obtaining the desired end product. The team must not lose sight of the fact that the purpose and the end product of the exercise is to facilitate the management of local government. Therefore, besides being of the highest quality, the final document must be placed in the hands of the municipal executives or regional governments at the right moment if it is to be of use as a decision-making instrument. Accordingly, it is preferable to restrict the work to the management of a limited number of the most important indicators or variables and ensure that it meets the needs of the microregion. This is in no way meant to suggest that important (long-term) concerns should be shelved in order to address the most pressing (short-term) issues.

Once it has defined the technical and administrative working arrangements, the team is ready to get down to the task of preparing the set of maps of the microregion, which will include the following dimensions:

- Renewable natural resources: soil, water and plant cover
- Population, population pattern and population centers
- Land tenure and farm size according to the organization of production and productive systems.
- Products, production and productivity
- Trade and market mechanisms

<sup>4</sup> In the case of non-renewable natural resources, special emphasis should be placed on mineral deposits.

- Physical infrastructure: roads, institutions, community facilities and production support services.

## b. Characteristics of the information

- The time period covered by the data in each dimension should be similar. The information used to analyze the different dimensions should cover the same time periods and the level of detail should be similar. Methodologically speaking, it should be stressed that the analysis of trends proposed later in the study calls for observations of the same variables (or indicators) at two points in time that are far enough apart ( $\pm 10$  years).
- Make maximum use of the practical experience of the local officials and leaders involved.
- Capitalize on the information that can be obtained from technical documents produced by universities and other research centers.
- Focus the efforts on the most outstanding features of the information.

In preparing the maps, focus only on the most important features of each of the dimensions based on existing secondary information, such as previous studies, satellite images, natural resource maps, population and agricultural censuses, household surveys.

- Adjust the information  
A key factor in preparing the maps is the team's ability to harmonize the information from different scale maps, covering different points in time or with different levels of detail. It is advisable that at least one member of the team be well versed in the operation of a user-friendly geographic information system in order to be able to iron out problems of this kind and ensure that the information is properly recorded in the database.
- Estimate the time needed  
Producing each set of maps takes a specific amount of time. The

information has to be keyed in and the relevant symbols created and colors selected to represent the variables/dimensions included in each map.

### **b. Guidelines for preparing the maps**

The set of six maps synthesizes the information and forms the basis for the integrated analysis of the spatial dynamics of the microregion. Each map is a unit that shows the current status of its particular theme and at the same time facilitates the interpretation and projection of the trends observed. The interrelationships among the processes of physical and human geography in the microregion are also important. It is the team's task to assess their potential, determine where the bottlenecks lie and identify any possible conflicts that exist in the area that could be an obstacle to microregional sustainable development.

The six supporting maps and the analysis provide an instrument for planning and designing actions to eliminate bottlenecks and strengthen the different dimensions. This instrument can be adapted to the particular characteristics of different spatial units by introducing new variables, modifying the dimensions, etc.

The integrated analysis of the geographically located variables in the six maps is completed by preparing two summary maps dealing with natural resources and socioeconomic aspects. The next stage, the analysis of the internal dynamics of the microregion, is thus based on the cartographic material prepared.

Some preliminary activities can be carried out to facilitate the preparation of the maps. These are as follows:

- Prepare a directory with the names of institutions, research centers, libraries, etc., from which data could be obtained. Include the names of key informants.
- Distribute the information sources among the team members so that they can compile the information.

- Select clear, meaningful scales, symbols and forms of cartographic representation.
- Select forms, methods and techniques for compiling, organizing and presenting the information.
- Consider the trends in the values of the variables over time -now and at another point in time, one or more decades ago- in order to be able to visualize the continued existence, worsening, eradication or emergence of problems.

To orient the preparation of each of the six maps and the summary maps, four tables have been organized that present the objectives, activities, information sources, methods and techniques, plus a brief description of the expected outputs.

The reiteration of the sources, methods and techniques in these tables is intended to help the reader grasp them more easily and, above all, to show the interrelationships among the dimensions represented in each map.

#### **• Map of renewable natural resources**

In most Latin American and Caribbean countries, secondary information is available on different aspects of this dimension, e.g. geology, soil, vegetation and hydrology maps based on information obtained from satellite images or aerial photographs. These maps are usually accompanied by analytical documents that should be compiled and used by the team to prepare a map containing, primarily, the following information:

- **Soils:** soil use capability and current soil use. If no soil use capability and/or current soil use maps are available, geomorphological or other maps that will highlight soil use conflicts can be used.

It is important that this analysis clearly present the current level of conflict vis-a-vis soil use and the limits and possibilities for crop,

livestock and forestry activities in the microregion, as well as the conflict with urban areas that are expanding into the countryside.

- **Water:** Hydrological or hydrographic system; use of water resources (irrigation, human consumption, agroindustry); delimitation of watersheds and subwatersheds.
- **Plant cover:** type of plant cover.

Based on the secondary information, a map is prepared showing the main characteristics of these three principal resources and, on the same map or a separate one if the information is very complex, the areas of conflicting use, high-risk areas, and the possibilities of expanding the agricultural and urban frontier without depleting renewable natural resources (see corresponding table).

This summary should emphasize present soil and water use trends and where these could lead, either in terms of the unexploited productive potential or the main conflicts observed. For example, areas where soils are being eroded, sedimentation, fluctuations in and the availability of water for human use and irrigation, the deterioration in water quality as a result of pollution caused by the use of agrochemicals or industrial or mineral effluents, deforestation, etc.

If sufficient information is available, the microwatersheds of the target area can also be represented on the map. This could subsequently facilitate the systemic management of the water available in the microregion, provided that the information can be cross-referenced with the analysis of the production system or general soil use, be it rural (agricultural, livestock, forestry activities etc.) or urban.

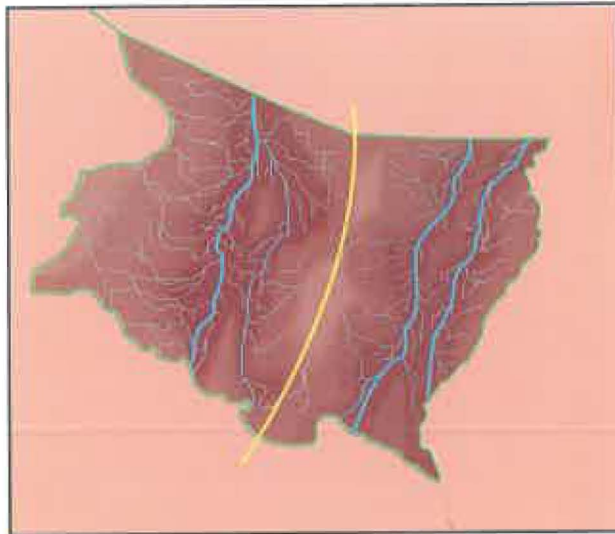
OBJECTIVES	ACTIVITIES	SOURCES OF INFORMATION, METHODS AND TECHNIQUES	CHARACTERISTICS OF THE PRODUCT
<ul style="list-style-type: none"> <li>• To identify the characteristics, conflicts and potential of three basic resources: water, soil and plant cover.</li> <li>• To represent on a renewable natural resources map the characteristics identified for each of the resources mentioned.</li> <li>• On the same or another map, to graphically represent the areas where conflicts over use and ecological risks exist, and the potential for expanding the agricultural and urban frontier.</li> </ul>	<ul style="list-style-type: none"> <li>• For the water resource:                             <ul style="list-style-type: none"> <li>- Delimit the watershed, sub-watersheds and hydrographic and hydrological systems of the microregion.</li> <li>- Prepare the cartographic representation of the use of water resources (irrigation, human consumption, agroindustrial activity).</li> </ul> </li> <li>• For the soil resource:                             <ul style="list-style-type: none"> <li>- Represent cartographically the type of plant cover and the areas where possible conflicts exist, the limits to and potential for agricultural, livestock and forestry activities, and the areas of conflict due to urban expansion.</li> </ul> </li> <li>• For the plant cover resource:                             <ul style="list-style-type: none"> <li>- Represent cartographically the type of plant cover and the areas where conflicts exist over use, irrigation or the expansion of the agricultural and urban frontier. All on the same map, if the complexity of the data so permits.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Satellite imagery</li> <li>• Aerial photography</li> <li>• Maps: geology, soils, plant cover, hydrology, soil use capability and current soil use, geomorphology, relief, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• The renewable natural resources map must show the status of these resources in the microregion and facilitate the integrated analysis of water, soil and plant cover.</li> <li>• This map will also facilitate recognition of areas characterized by conflicting uses natural resources, or those where their use is expanding or decreasing, or areas which are at risk</li> </ul>

### MAP OF NATURAL RESOURCES

### MAP OF NATURAL RESOURCES

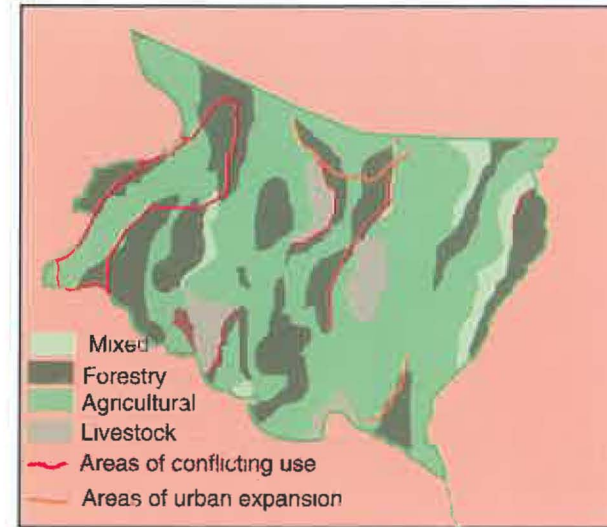
#### WATERSHEDS

Main drainage systems and microwatersheds (and topography).



#### SOIL USE CAPABILITY AND CURRENT USE

Location of soil use capability and its relationships with the dynamics of urban expansion and areas of conflicting use.

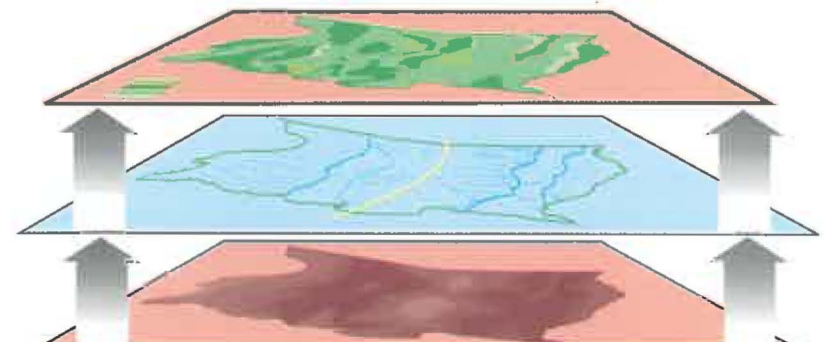


#### PLANT COVER

Types of plant cover by location and surface area



Location of soil use capability and its relationships with the dynamics of urban expansion and areas of conflicting use



• **Map of the spatial distribution of the population**

This map will be designed based on the physical location of the different types of population centers within the microregion, representing the economic importance and political hierarchy of each one and their population density.

Some of the existing sources that can be used to construct this map are political-administrative maps, population and housing censuses, household surveys, population studies, local monographs, municipal population statistics and aerial photographs.

The following data should be graphically represented on the map:

- spatial distribution of the population (location of the population within the spatial unit and number of inhabitants per square kilometer).
- Spatial distribution of the population between urban and rural areas.
- Characteristic population pattern by subareas of the microregion: concentrated or dispersed.
- Areas of in- and out- migration; migratory flows; areas with zero population growth, a declining or growing population. Location and identification of the population by size and in the hierarchical-administrative structure (according to the economic importance and/or services for the microregion).
- Indication of the articulation between different populations through administrative, business and recreational links and sources of employment, etc. Specifying the linkages between the populations in rural subareas of the microregion.
- Indication of important regional population centers and within the national urban network.

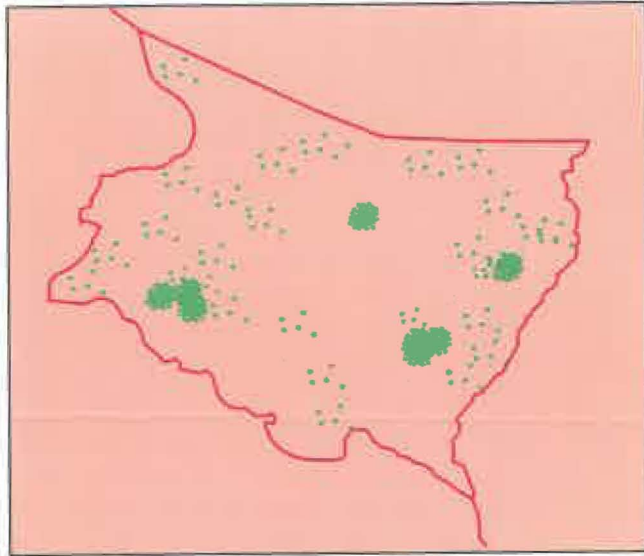
The purpose of the map of the the spatial distribution of the population is to convey, in a simple fashion, the population dynamics of the microregion and how they relate to the occupation and use of space, in order to determine the limits and present and future potential of the subareas of the microregion. And to show the types of population centers, their role in relation to the rest of the microregional territory and the articulations with other microregional and regional spaces.

TABLE FOR THE MAP OF THE SPATIAL DISTRIBUTION OF THE POPULATION		
<b>OBJECTIVES</b>	<b>ACTIVITIES</b>	<b>SOURCES OF INFORMATION, METHODS AND TECHNIQUES</b>
<ul style="list-style-type: none"> <li>• To identify the most important elements and trends in the population dynamics at the microregional level</li> <li>• To explain the interrelationships among these elements and the forms of occupation and use of the territory.</li> <li>• To recognize linkages in the population dynamics at the micro-meso and macro levels (microregional, regional and national), as well as between the rural and urban population</li> <li>• To estimate the limits and present and future possibilities of the population processes in the microregion</li> <li>• To identify social problems with regard to employment, in- and out-migration and the labor force</li> <li>• To identify target populations, subareas and the approximate scale of problems</li> </ul>	<ul style="list-style-type: none"> <li>• To locate the population centers within the microregion</li> <li>• To determine symbols for representing the importance of each population center according to:                             <ul style="list-style-type: none"> <li>- population density</li> <li>- economic importance</li> <li>- level in the political and administrative and services hierarchy</li> </ul> </li> <li>• To graphically represent:                             <ul style="list-style-type: none"> <li>- the main settlement patterns (concentrated-dispersed);</li> <li>- urban networks</li> <li>- areas of influence of the main centers</li> <li>- areas of in- and out-migration</li> <li>- migratory flows</li> <li>- areas, with growing, shrinking or stagnated populations</li> <li>- rural or urban population</li> </ul> </li> <li>- interrelationships among the urban national network, subareas and population centers, indicating the type of linkage: administrative, business, recreational, source of employment, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• political-administrative maps</li> <li>• population and housing censuses and household surveys</li> <li>• studies on poverty</li> <li>• population studies</li> <li>• Monographs and local statistics</li> <li>• aerial photographs</li> <li>• municipal population statistics</li> <li>• maps of natural resources</li> <li>• methods of measuring poverty in LAC: basic needs unmet (UNDP and ECLAC), the poverty line, combination of methods</li> <li>• techniques for identifying and recording the population below the poverty line</li> </ul>
	<b>CHARACTERISTICS OF THE MAP</b>	
	<ul style="list-style-type: none"> <li>• This map should represent the most important characteristics of the population dynamics in the microregion, considering the interrelationships among:                             <ul style="list-style-type: none"> <li>- the type of land occupation and use</li> <li>- the types of population centers and the relationships among their hinterlands</li> <li>- the articulations with other microregional spaces</li> <li>- the type of population, whether urban or rural, age group and gender, and</li> <li>- determining present and future potential, identifying subareas.</li> </ul> </li> </ul>	

**MAP OF SPATIAL DISTRIBUTION OF THE POBLATION**

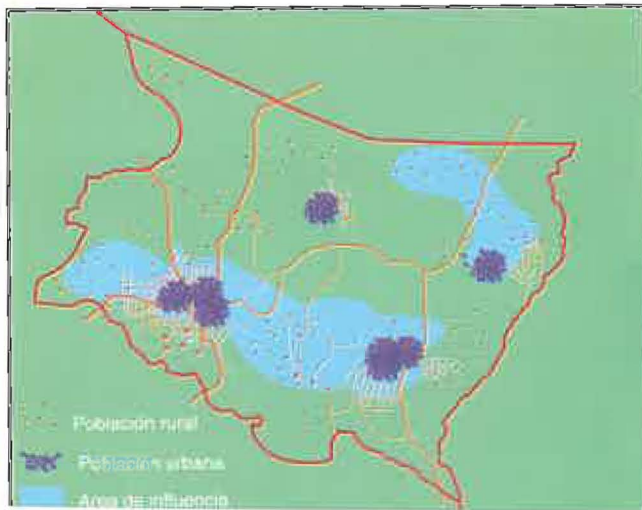
**SPATIAL DISTRIBUTION OF THE POPULATION**

Spatial configuration of the most important population patterns



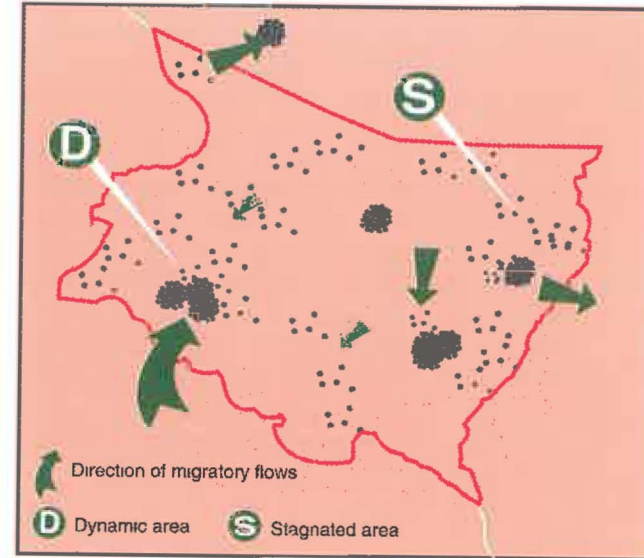
**URBAN / RURAL POPULATION**

Location of the rural and urban population and the areas of influence of the urban centers. The urban network is highlighted.



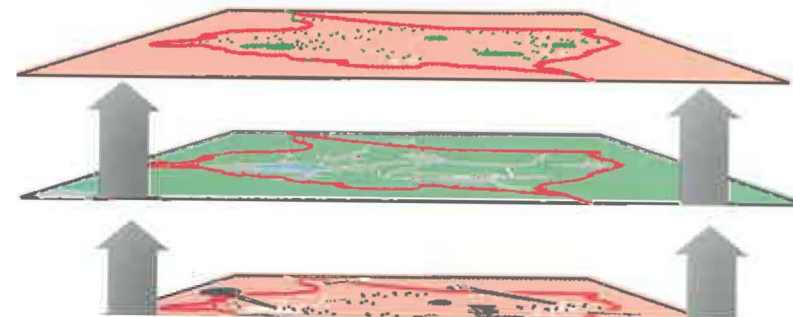
**MAP OF SPATIAL DISTRIBUTION OF THE POBLATION**

**POPULATION DYNAMICS**



The arrows indicate migratory flows from areas of out-migration to areas of in-migration. The population dynamism of the subareas is represented

The integrated analysis of the variables represented on these maps synthesizes the population dynamics situation



**• Map of land tenure and farm size, by form of social organization of production and production system**

Experts on the subject agree that in Latin America and the Caribbean the social organization of agricultural production can grossly be divided into two categories: small-scale farming and commercial farming. Each has its own productive arrangements, labor force, combination of factors of production and different levels of resources and opportunities in the market and in the political and social life of the countries.

Within each of these broad categories there are subcategories based on farm size, the type of ownership (individual, joint community), the principal activity (agricultural, livestock, forestry, mixed farming), and the type of production systems used (singlecrop farming, multicourse systems, etc.). A classification has been established for small farmers based on the capacity of the farm to guarantee the satisfaction of family needs and production on the plot, namely small farms that operate at the subsistence, break-even and surplus levels. The characteristics of producers and their farms are used to determine the target populations, actions, priorities, resources, etc., of any rural development strategy, so that every effort must be made to ascertain a differentiated analysis based on this information.

**Bearing all this in mind, in preparing the map the team must:**

- Locate the "areas" of the microregion according to the number and predominant size of the farms involved: micro-holdings, small, medium-sized and large farms.
- Represent the principal form of social organization in each "area."
- Represent the principal type of activity and, if possible, the most commonly observed production system.
- Identify the legal situation with regard to land tenure and/or ownership.

Based on this information, the team proceeds to mark and graphically represent possible areas of conflict, cooperation and interaction within and among the various forms of social organization of production and farm density by subarea, the potential for, or impossibility of, expanding farms, and the problem of micro-holdings or land concentration. The corresponding table organizes the information that should be obtained in preparing the map.

TABLE FOR THE MAP OF LAND TENURE AND FARM SIZE, BY FORMS OF SOCIAL ORGANIZATION OF PRODUCTION AND PRODUCTION SYSTEMS	
OBJECTIVES	<ul style="list-style-type: none"> <li>• To show the spatial distribution of the different characteristics of the forms of social organization for both small-scale and commercial production</li> <li>• To identify the variations and linkages among the subareas of the microregion in relation to the social organization of production that each of them represents</li> </ul>
ACTIVITIES	<ul style="list-style-type: none"> <li>• To graphically represent the data related to:                             <ul style="list-style-type: none"> <li>- the type of ownership (individuals, joint, community)</li> <li>- type of principal activity (agricultural, livestock, mixed farming)</li> <li>- type of production system employed (monocropping, multicourse, etc.)</li> <li>- capacity of the farm to guarantee the satisfaction of family needs (subsistence, break-even, surplus)</li> </ul> </li> </ul>
SOURCES OF INFORMATION, METHODS AND TECHNIQUES	<ul style="list-style-type: none"> <li>• Maps:                             <ul style="list-style-type: none"> <li>- political-administrative</li> <li>- current soil use</li> <li>- natural resources</li> <li>- settlement pattern</li> </ul> </li> <li>• population, agricultural censuses</li> <li>• population, agricultural censuses</li> </ul>
CHARACTERISTICS OF THE PRODUCT	<ul style="list-style-type: none"> <li>• This map should clearly show the most notable characteristics of the different farms, according to the various forms of the social organization of production, by subarea, and the types of interaction among them.</li> </ul>

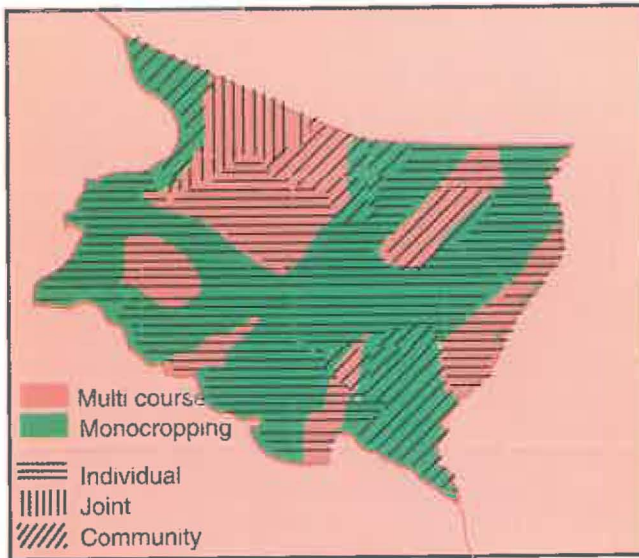
**MAP OF LAND TENURE AND FARM SIZE:  
SOCIAL ORGANIZATION OF PRODUCTION**

**MAP OF LAND TENURE AND FARM SIZE:  
SOCIAL ORGANIZATION OF PRODUCTION**

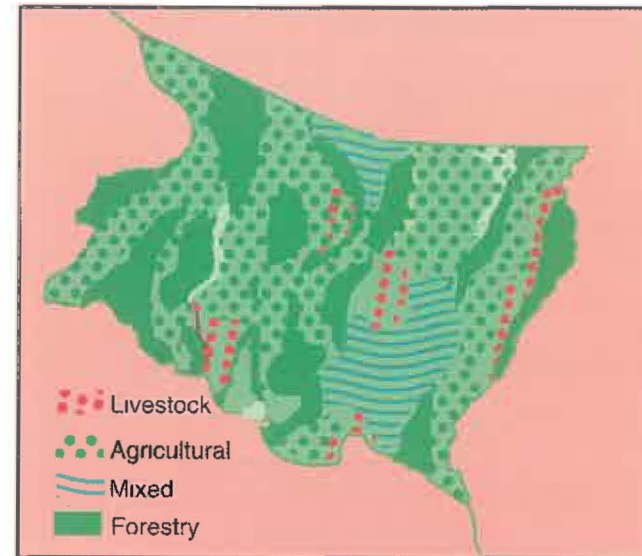
**PRODUCTION SYSTEM/LAND TENURE**

**TYPE OF PRODUCTIVE ACTIVITY**

Spatial location of the type of ownership and the production systems (monocropping or multicourse)

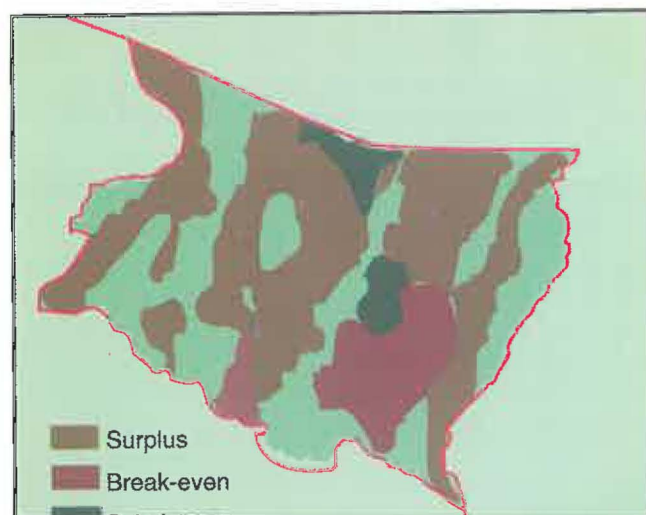


Location of principal productive activities

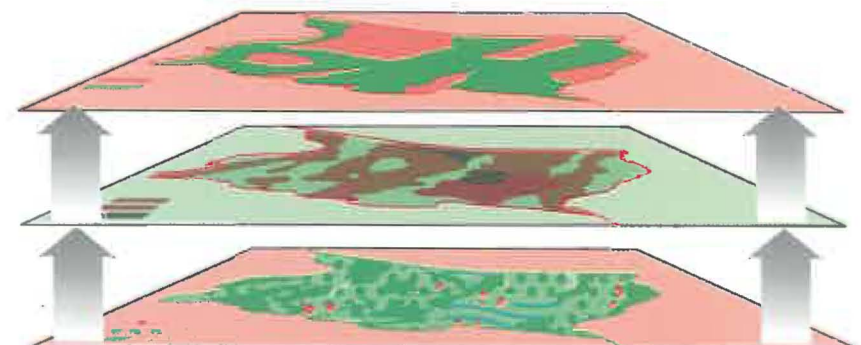


**FARMS/FAMILY NEEDS**

Location of farms according to their capacity to satisfy family needs.



The information contained in these maps will be integrated into a single map showing the interrelationships among the principal geographically located variables





**• Map of products**

In order to construct this map, it is necessary to:

- Identify and mark the subareas according to the type of production (agricultural, livestock, forestry, mixed), the two or three most important products, and “emerging” products, i.e., those with high growth rates and targeted at new market niches.
- Verify succinctly the actual availability of production technology and the processing of major and “emerging” products.
- Identify the predominant production trend: for on-farm consumption, bartering, sale for direct local consumption (within the microregion), regional consumption, large cities, export, agroindustry.
- Characterize average rates of productivity and compare them with national and regional rates.

**• Map of the trade system and markets for products**

For the construction of this map, it is necessary to:

- Spatially locate, in the main population centers or ad hoc locations, the collection centers, fairs or markets (differentiating between types of agricultural and other products) and the frequency with which they are held.
- Graphically represent the volume of transactions.
- Identify and graphically represent trade relationships (both ways) with other microregions.

**• Map of the physical infrastructure: roads, community facilities, services and production support services**

- Identify roads, highways, trails and their present condition, representing them according to their characteristics.
- Identify schools, clinics, post offices and their current status
- Identify government offices, banks and agricultural, extension and/or research centers
- Identify dams, irrigation channels, warehouse and cold storage facilities, canals.

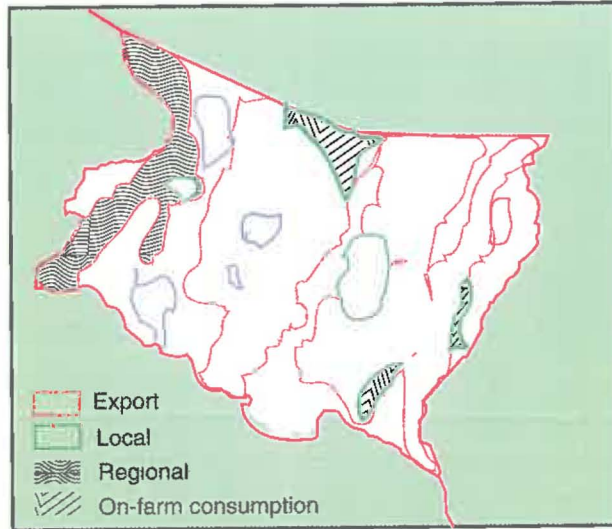
The corresponding tables describe the elements involved in the preparation of these maps and indicate the basic characteristics for completing them.

TABLE FOR THE MAP OF PRODUCTS			
<p><b>OBJECTIVES</b></p> <ul style="list-style-type: none"> <li>• To characterize the type of production, its principal orientation and target markets</li> <li>• To identify and represent the spatial location of production</li> </ul>	<p><b>ACTIVITIES</b></p> <ul style="list-style-type: none"> <li>• To identify and graphically represent the areas and subareas according to the type of production</li> <li>• To determine and geographically locate the two or three most important products of the microregion</li> <li>• To classify production according to whether it is for on-farm consumption, bartering, sale for direct local consumption (i.e., within the microregion), regional, large cities, export, agroindustry</li> <li>• To show the target markets, using arrows</li> </ul>	<p><b>SOURCES OF INFORMATION, METHODS AND TECHNIQUES</b></p> <ul style="list-style-type: none"> <li>• Maps:                             <ul style="list-style-type: none"> <li>- political-administrative</li> <li>- soil use capability and current use</li> <li>- natural resources</li> <li>- settlement pattern</li> <li>- land tenure and farm size, by form of social organization of production and production systems</li> </ul> </li> <li>• Population, agricultural censuses</li> <li>• Statistical yearbooks with information on economic variables</li> </ul>	<p><b>CHARACTERISTICS OF THE PRODUCT</b></p> <ul style="list-style-type: none"> <li>• The map of products will graphically represent the characteristics of production in the microregion in regard to the type of production, target markets, and flows. This graphic representation will also show areas and subareas within the microregion that will facilitate the interpretation of the spatial patterns of these variables and their intra- and inter-microregional relationships</li> </ul>

MAP OF PRODUCTS

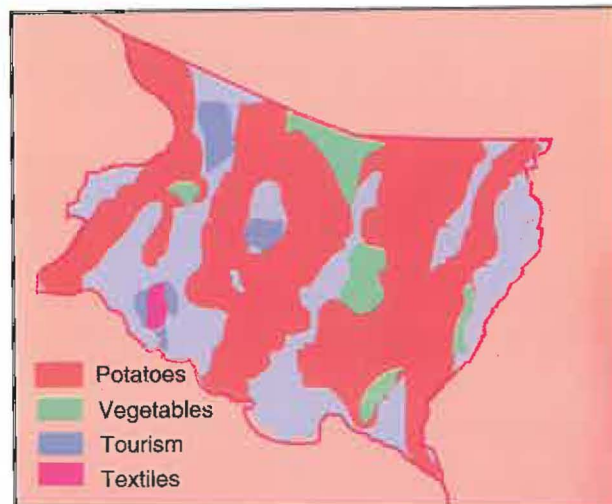
PRODUCTION OF MARKETS

Location of types of production in relation to the type of marketing and target market.



PRODUCTS

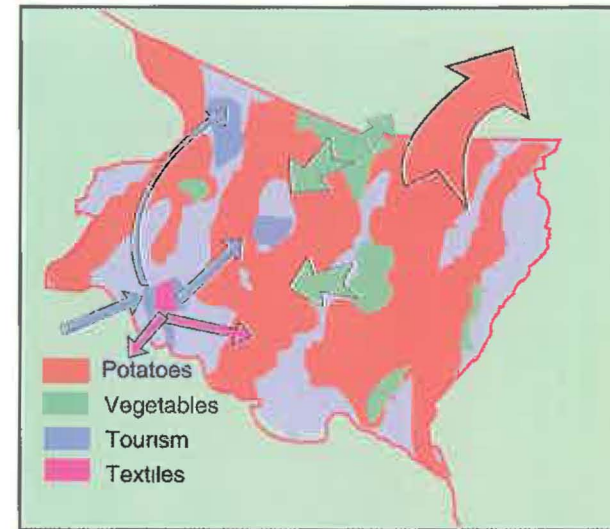
Spatial location of the areas by type of principal productive activity



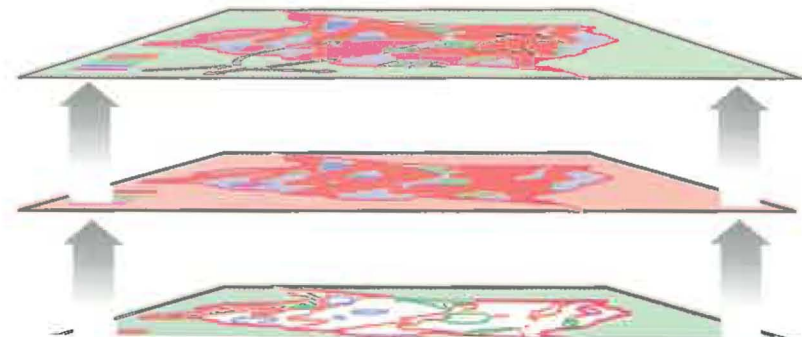
MAP OF PRODUCTS

TRADE FLOWS-TARGET MARKETS

Location of the forms of marketing of production in relation to the population centers and their areas of influence



This map will show the dynamics of the intra- and inter-microregional trade processes, highlighting the most important products



<b>TABLE FOR THE MAP OF THE TRADE SYSTEM AND MARKETS FOR PRODUCTS, SERVICES AND INPUTS</b>			
<b>OBJECTIVES</b>	<b>ACTIVITIES</b>	<b>SOURCES OF INFORMATION, METHODS AND TECHNIQUES</b>	<b>CHARACTERISTICS OF THE PRODUCT</b>
<ul style="list-style-type: none"> <li>Both this and the previous map should identify, characterize, quantify and classify the productive activity so as to locate it geographically.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and map the location of collection centers, processing plants, cold storage facilities and markets in relation to the population centers of the microregion</li> <li>Characterize and classify the centers in question by type of product and the frequency with which they are held (daily, weekly, monthly, annually)</li> <li>Graphically represent the volume of transactions, trade relationships with other microregions and subareas (both ways)</li> </ul>	<ul style="list-style-type: none"> <li>Maps               <ul style="list-style-type: none"> <li>political-administrative</li> <li>soil use capability and current use</li> <li>natural resources</li> <li>settlement pattern</li> <li>land tenure and farm size, by forms of social organization of production and production systems</li> </ul> </li> <li>Population, agricultural censuses</li> <li>Statistical yearbooks with information on economic variables</li> <li>Periodic reports of business, industrial associations, farmers' cooperatives, etc.</li> <li>Specialized journals</li> </ul>	<ul style="list-style-type: none"> <li>This map should show clearly the dynamics of trade in the production of the microregion, its most salient characteristics and the consequences for the spatial configuration of the microregion</li> </ul>

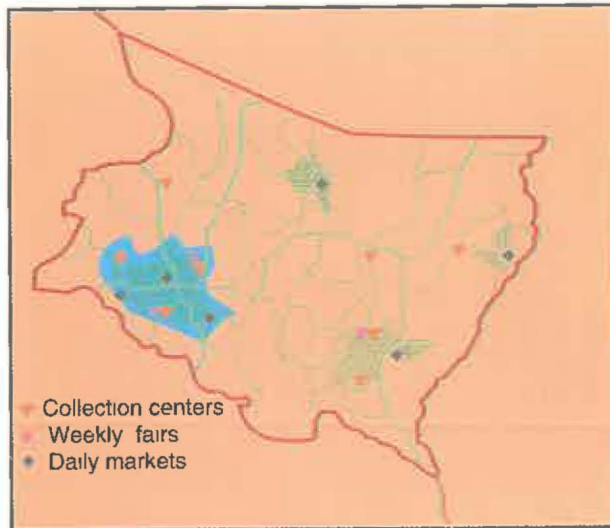
<b>TABLE FOR THE PHYSICAL INFRASTRUCTURE MAP: ROADS, COMMUNITY FACILITIES AND SERVICES</b>			
<b>OBJECTIVES</b>	<b>ACTIVITIES</b>	<b>SOURCES OF INFORMATION, METHODS AND TECHNIQUES</b>	<b>CHARACTERISTICS OF THE PRODUCT</b>
<ul style="list-style-type: none"> <li>To identify and represent the most important elements of the physical infrastructure: roads, community facilities and production support services.</li> </ul>	<ul style="list-style-type: none"> <li>To map the principal elements of the infrastructure of the microregion, classifying them by type:               <ul style="list-style-type: none"> <li>roads, community facilities and production support services</li> </ul> </li> <li>To select the symbols and the scale for the cartographic representation of the elements, according to their characteristics and considering:               <ul style="list-style-type: none"> <li>roads, highways and trails</li> <li>schools, clinics and post offices</li> <li>government offices, banks, agricultural and extension and/or research centers</li> <li>dams, irrigation canals, warehouses, cold storage facilities and canals</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Maps               <ul style="list-style-type: none"> <li>political-administrative</li> <li>soil use capability and current use</li> <li>natural resources</li> <li>settlement pattern</li> <li>land tenure and farm size, by forms of social organization of production and production systems</li> <li>maps of the trade system and the market for products, services and inputs</li> <li>road map</li> </ul> </li> <li>Population, agricultural censuses</li> <li>Statistical yearbooks containing information on economic variables</li> </ul>	<ul style="list-style-type: none"> <li>It is important that this map clearly show the characteristics of the infrastructure in order to be able to conduct an integrated analysis of the situation vis-a-vis production in the microregion</li> </ul>

**MAP OF THE TRADE SYSTEM / PRODUCT MARKETS / SERVICES AND INPUTS**

**MAP OF THE TRADE SYSTEM / PRODUCT MARKETS / SERVICES AND INPUTS**

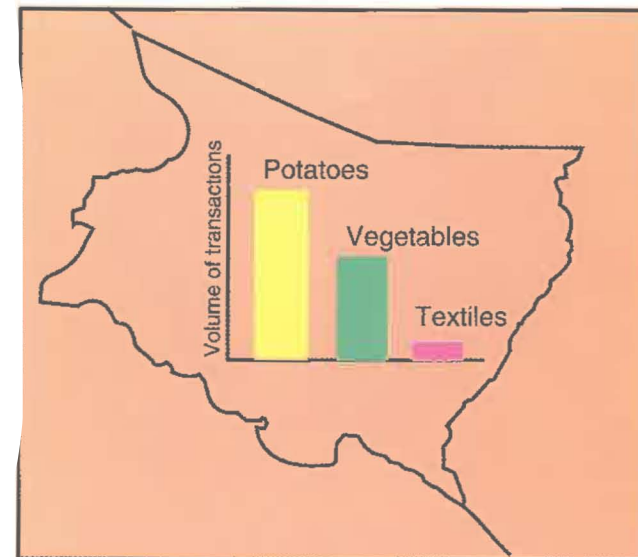
**MAP OF TRADE**

Location of the forms of marketing of production in relation to the population centers and their areas of influence



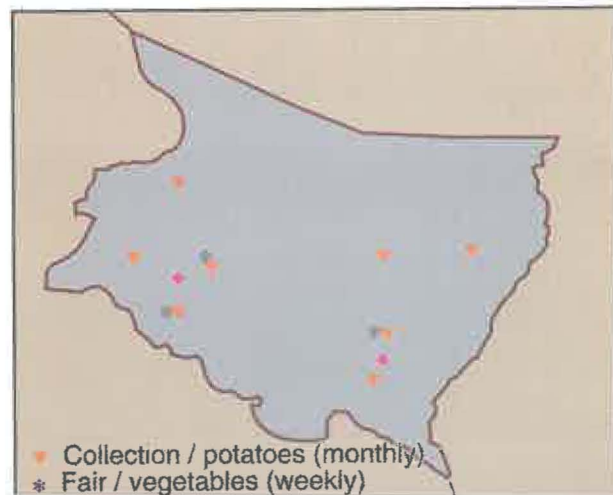
**MAP OF VOLUME OF TRADE**

Volume of transactions in principal products.

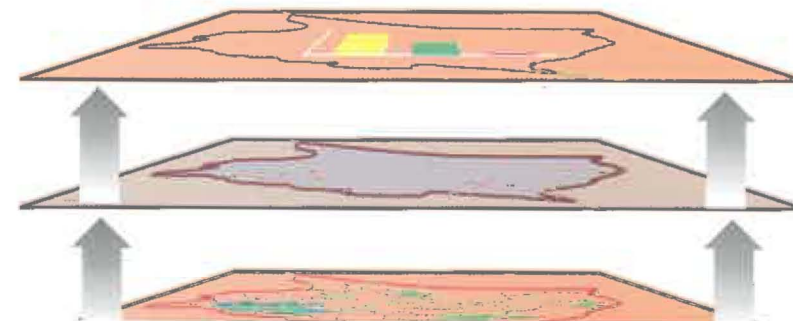


**MAP OF MARKETS**

Location of markets by type of product and the frequency with which they are held



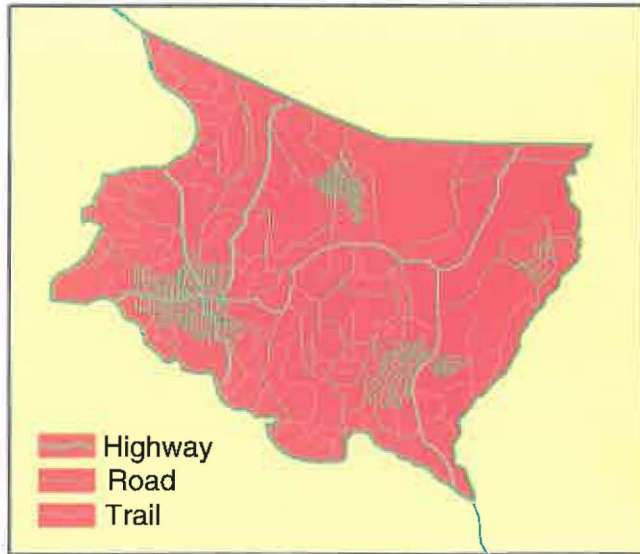
The integrated analysis of the variables represented on these maps synthesizes the productive and marketing situation.



**MAP OF THE INFRASTRUCTURE: ROADS, COMMUNITY FACILITIES AND SERVICES**

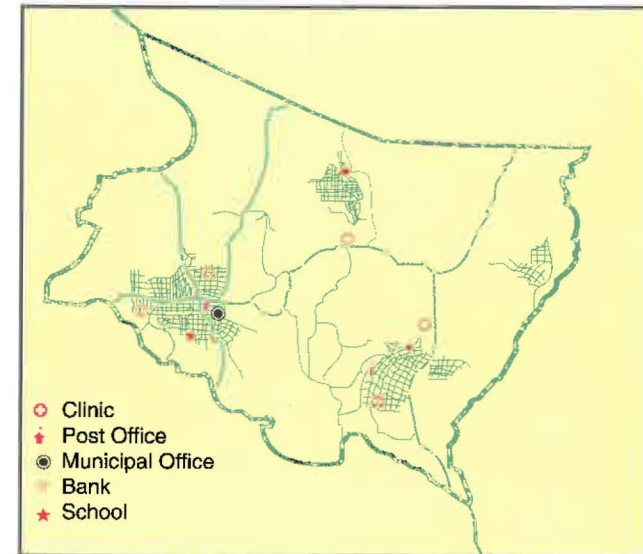
**MAP OF ROADS**

Representation of the main road networks, population centers and the subareas that they interconnect



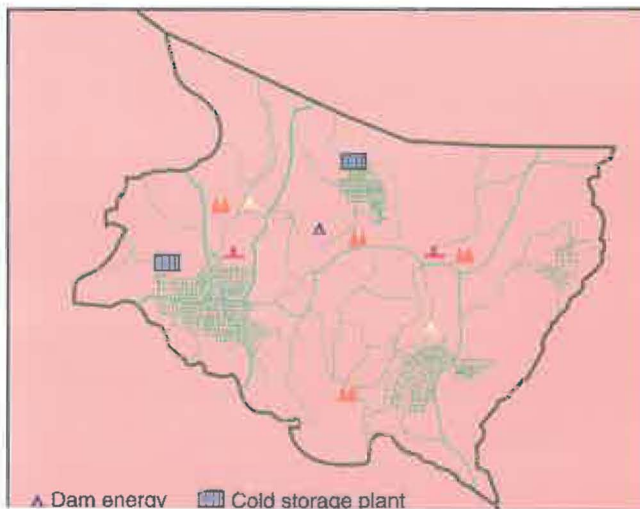
**SOCIAL AND PRODUCTIVE INFRASTRUCTURE**

Location of the social infrastructure

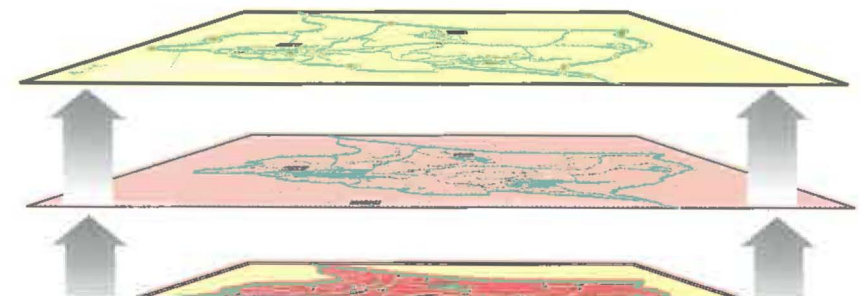


**MAP OF PRODUCTION SUPPORT SERVICES**

Spatial location of the infrastructure of support for productive activities



The integrated analysis of variables represented on these maps synthesizes the productive and social infrastructure



### c. Analysis and summary to verify the hypothesis

Based on the information contained in the six maps, the team proceeds to conduct a second analysis in order to verify the existence of the microregion.

This analysis will either confirm that the originally proposed boundaries were correct or result in their modification, identify "subareas" with special characteristics, and establish the degree of articulation among them, between the microregion and the population centers, and among the latter.

When this first analysis is completed, the team will have identified the characteristics of the microregion and have a rough idea of its limitations and potential vis-a-vis sustainable development.

Once the boundaries and major features of the microregion have been established, the team is ready to undertake a more precise and detailed analysis of each of the dimensions on which the maps are based, organize other kinds of information, and conduct a more dynamic analysis of the social structure, actors and institutions. These are the objectives of the next phase.

## PHASE III

### Internal dynamics. Analysis by dimension of development.

The purpose of this section is to verify and process the data and analyze the internal dynamics of the microregion through a more detailed analysis of its core elements:

- renewable and non-renewable natural resources
- population
- socioeconomic and productive aspects
- basic infrastructure
- social development
- political and institutional situation.

The product to be generated in this phase is a summary of the principal conflicts and potential vis-a-vis rural development, by subareas, population groups and types of farms, socioeconomic situation, existing infrastructure, and level of social and institutional development.

### Parametric calculus and projections of variables

Variables and their projections can be calculated much more easily using software programs that incorporate mathematical calculus techniques. Microsoft Excel, for example, has 70 statistical functions and 19 ToolPaks for the statistical analysis of data. These include correlation, covariance, descriptive statistics, exponential smoothing and regression tools. In addition, some statistical texts are now supplied with a diskette containing tools such as probability analysis, multiple linear regression, standard deviations and non-parametric statistics. (Kaznier and Diaz 1993).

As far as possible, all the information organized and analyzed should be keyed into the data base and all the information sources used and/or found recorded.

The information required for each of the central elements is outlined below. Certain techniques and information sources are suggested, along with some key questions that can be used to guide the process.

#### - Renewable natural resources

It is advisable to prepare a summary map for this analysis, using the maps of natural resources, land tenure, products and forms of the social organization of production to determine the natural subareas that characterize the microregion. This information is used to pinpoint the principal problems, trends and potential vis-a-vis the use of natural resources in the microregion. The characteristics of the resources in question are correlated with the forms of social organization of production, cropping systems, the suitability and use of the soil compared to the principal crops and production and conservation practices and technologies.

The information contained in the maps will have to be complemented with personal observations, interviews and questionnaires to determine the problems and potential of the natural resources; climate; water sources, access and management; cultivation systems; technologies; and social and economic constraints to the conservation and sound use of natural resources.

The maps and complementary information are then used to determine areas with high ecological risks, areas in a state of precarious or stable equilibrium, and/or their potential for expansion, reconversion and protection. Three criteria are used to make this determination: a. the characteristics of the resources; b. inputs and technologies within the economic reach of the users; and c. the needs of the producers in particular, and of the population in general.

Special attention should be paid to the situation vis-a-vis the base of renewable natural resources situated in areas where the agricultural frontier is being pushed back and which are proposed as possible spatial units for new agricultural or forestry development projects. The latter involve the drastic transformation of ecosystems and, at the same time, must harmonize objectives related to productivity, sustainability and the maintenance of different options for use. (ECLAC 1989).

With regard to land use, it is essential to determine the areas where production could be increased in combination with buffer zones, protected and conservation areas, and ecological reserves.

The following is a list of possible indicators that can be used to characterize the principal ecological problems detected:

- **Soil**

- erosion (scale and intensity);
- small-scale topographic changes;
- soil compactation;
- loss of fertility;
- salinization in irrigation zones;
- desertification.
- drainage deficiencies

- **Water**

- increase in sediments in the beds of the most important rivers;
- pollution of surface and underground waters;
- changes in patterns of natural water systems;
- drastic changes in flora and fauna.

- **Climate**

- rainfall patterns (qualitative observation).

If the basic information is not readily available, recourse can be made to qualitative observations by individuals familiar with the microregion.

Although the analysis is carried out considering the subareas of the microregion as a unit, sight should not be lost of the overall picture. This is vital for the purposes of sustainability, since agroecological problems often do not concern farms or specific areas or characteristics but are the result and the consequence of the interaction between larger geographic units and aspects such as socioeconomic, agroecological and institutional issues.

In order to gain a better understanding of the problems involved in the management of renewable natural resources and the trends and potential of the ecological base, aerial photographs or satellite images taken at different points in time (over at least three or four decades) could be used.

The analysis should also take into consideration the agricultural and livestock cycles of the subareas of the microregion.

- **Demographic aspects and trends: distribution of the population, living conditions, employment and migration.**

The core objective of this element of the analysis is to ascertain the basic characteristics of the population, recent trends (size, distribution,

gender and age structure, living conditions and employment), growth rates and spatial mobility.

The expected output is the geographic location, by subarea, of the problems and potential of the population (by age group and gender and the nature of the difficulties) presented in figures and maps.

In addition to the information, the team should familiarize itself with: the type of questions and variables used in censuses; the methods most commonly used to measure poverty in LAC (failure to satisfy basic needs, poverty line, combined methods); and techniques for identifying and recording the population below the poverty line. These censuses and methods make it possible to understand problems, organize information and select and use secondary sources, which are very useful for the purposes of the analysis.

The information on the characteristics and population dynamics of the region must be collected and organized using at least two points in time: the present, and one or two decades ago, in order to identify demographic trends and see how they relate to the overcoming, continued existence, worsening or emergence of problems. Once this information is recorded in the database, it will be possible to make projections, forecast future trends and simulate scenarios.

The basic sources of information are the population and housing censuses. Especially useful are studies on poverty, local case studies and statistics, and surveys of households.

The basic information required is as follows:

- Total population and rate of growth
- Urban-rural population: distribution by subarea and population center
- Population broken down by gender and into the following age groups: 0 to 1 year; 1 - 5; 6 - 14; 14 - 49; and 50 and over

This disaggregation is essential to determine target populations and the types of problems that exist.

- Educational level of the population
- Population by level of illiteracy
- Infant mortality rates
- Total number of households
- Average number of members per household
- Average number of children per household
- Number of households with women heads of household
- Physical characteristics of the housing stock
- Basic services of the housing stock (electricity, water and sanitation)
- Households with school-age children who do not attend school
- Economically active population of the microregion
- Agricultural and non-agricultural economically active population by occupation
- Small farmer economically active population
- Wages: urban/rural non-agricultural/agricultural
- Emigrant population by gender and age
- Immigrant population by gender and age

This basic information provides an overview of the population and makes it possible to analyze four key problems that must be overcome if microregional development is to be achieved: employment, the satisfaction of basic needs, migration, and the scale of present and future needs in relation the actual and projected population.

For example, with regard to the quality of life and poverty, the information on households makes it possible to apply the method of unmet basic needs developed by the UNDP and ECLAC. This is based on the use of five indicators, the information for which can be obtained from population and housing censuses:

- Households living in inadequate dwellings
- Households without basic services
- Households in which overcrowding is critical
- Households with school-age children who do not attend school
- Households with high economic dependency.

Rates of illiteracy and primary and secondary school attendance can also be specified by subarea.



With respect to employment, the information makes it possible to:

- Determine employment and unemployment rates
- Establish the rurality of the EAP:

$$\frac{\text{agricultural EAP} \times 100}{\text{Total EAP}}$$

- Establish the degree of "campesinización":

$$\frac{\text{Farmers with 1-5 ha.} \times 100}{\text{agricultural EAP}}$$

Once organized and analyzed, this information should be used to determine social and employment problems and the expulsion of the labor force and identify target populations, subareas and the approximate scale of the problem.

This analysis complements and specifies the population and population centers and physical infrastructure maps.

#### • Socioeconomic aspects

The primary objective in this area is to determine the characteristics of producers and farms, their technological and management levels and main production and trade systems, and to detect the problems and potential at the different levels mentioned and in the microregion as a whole.

This analysis provides a mosaic of the microregion, based on the following four maps:

- **Land tenure, forms of social organization of production and production systems.**
- **Products:** production, management capability, technological levels and productivity; the existence of agro- and other industries; production support services.

- **Spatial system of trade and markets.**
- **Basic infrastructure:** energy, road and water transportation (as applicable), ports, airports, telecommunications and recreational areas.

To facilitate the process, the analysis will be organized in the following sequence:

- Draw on a map the boundaries of the subareas determined in the previous section.
- Based on this demarcation, the four maps mentioned above are superimposed in order to gain a rough idea of the spatial distribution of the farms, production and infrastructure.

The summary map is used to conduct an initial analysis of the conflicts and potential of the subareas and the microregion as a whole. Once this first analysis has been carried out, the information is complemented for each of the dimensions of the analysis through interviews, questionnaires, observation and the organization of secondary sources, censuses, studies and local case studies.

- Basic complementary information by subarea:  
Land: characteristics by natural zones, by irrigation, by size.

#### • Basic data

- Total surface area of the territory
- Surface area given over to livestock activities
- Surface area given over to agricultural activities
- Surface area given over to forestry activities
- Land under irrigation
- Rainfed land
- Total number of farms by size and tenure (use conversion methods to standardize hectares)
- Index of land concentration

### • Indicators

- Types of land tenure: farmer-owned, leased, squatted (individual, commercial, cooperative)
- Size and number of farming units:

Less than 1 ha. to 5 ha.

From 5 to 10 ha.

From 10 to 20 ha.

From 20 to 50 ha.

From 50 to 100 ha.

- Irrigated/rainfed land

### • Products, production and productivity

- Spatial identification of production
- Preparation of figures and tables with information on the main agricultural, livestock forestry products.

Volume

Value

Surface area utilized

Physical yield per ha.

Use of manpower

Type of technology employed

- Use of production: on-farm consumption, bartering, sale (percentage for each use)

- Types of markets where production is sold: local, regional, principal cities, agroindustry, export market.

### Based on the information obtained:

- Ascertain the volume of agricultural production of the microregion; the importance of agricultural activities as compared to other productive sectors in terms of value, employment, contribution to "microregional GDP" (estimated)

- Make comparisons with regional and national averages of the following variables, in order to assess the limits and potential of agricultural and forestry activities in the microregion:

Productivity

Physical yield

Man/land ratio

Rurality of the EAP

### Classification of producers according to the forms of social organization of production

The purpose of the analysis in this section is to verify the previous information. A classification of producers is developed based on the identification of the principal forms of social organization of production and the principal cropping systems.

The most direct way of attaining the objective is by differentiating between two major forms of the social organization of production: commercial and small-scale agriculture. The main differences between these forms of social organization of production are: the underlying economic rationale (the profit motive or the satisfaction of family needs and activities on the plot); the type of technology used; the main type of labor force employed (salaried or household); and the type (quantity and quality) of resources at their disposal.

Once these major categories have been established, the most important subcategories can then be determined.

In the case of commercial farming operations three subcategories can be established based on farm size: small, medium-sized and large.

Having developed this initial classification, it is advisable that the resulting categories be related to the technology employed; the number of workers and types of products, which will make it possible to create a new category, perhaps drawing a distinction between modern and traditional commercial farms. Bearing in mind the objective of

sustainable microregional development, it is worth considering natural resource and production management and their impact on the environment.

In regard to the forms of social organization of small-farm production, it is advisable to first make a distinction between those with a collective institutional framework (communities, for example) and those that operate only as family production units.

The subcategories of small farms can be analyzed. The classifications used most often in the countries of Latin America and the Caribbean, such as those of FAO, IICA, IFAD and others, generally define four subcategories:

- **Small farmers below the subsistence level (very poor):** the resources that they possess (land, livestock, tools) are insufficient for them to satisfy the needs of the household and properly manage the plot. They are obliged to engage in agricultural activities off the plot, selling their manpower. (Generally speaking, they belong to the social groups living in extreme and/or absolute poverty)
- **Small farmers at the subsistence level (poor):** these are farmers who possess the minimum resources required to satisfy production and household needs, although they still need to complement the family's income by hiring out as laborers.
- **Small farmers without marketable surpluses:** they possess the resources necessary to satisfy household and productive needs, but with serious limitations in terms of their knowledge of modern production management techniques, low technological levels, poor management of market conditions, limited access to credit and appropriate technology that prevent them from satisfying their needs adequately.
- **Small farmers above the subsistence level (producers of marketable surpluses):** they have the resources, skills and conditions to

satisfy their needs, invest sufficiently in their plots and achieve a substantial level of savings. Many of these small farmers are in a process of transition towards specialized agriculture or stock raising.

**The criteria used to establish the subcategories are as follows:**

- Size of the plot and the quality of the resources.
- Ability to manage the farm.
- Degree of satisfaction of the needs of the household and the farm (income level).
- Use of family labor on the plot.
- Technological level.
- Marketable surplus.

The objective of this part of the analysis is to determine the sustainability of the different types of production and the real prospects of these farmers being able to insert themselves successfully and equitably into the microregional development process. It is known that the greater or lesser extent to which the different categories of producers insert themselves is directly contingent upon the rationale of the different productive agents, which in turn is determined by the structural framework, particularly marketing, prices and credit, security of tenure, etc.

### Production systems

Both commercial and small-scale production systems should be complemented with a description and analysis of the principal production systems that characterize each of the subcategories.

The presentation of the production systems should follow the agricultural or livestock cycle and the combination of the two, specifying the order and characteristics of the work, land preparation, planting, cultural practices, harvesting, sorting, bagging, storage, etc., and indicate the most common problems encountered in each of these phases.

In order to facilitate the presentation, the production systems should be organized into large groups: agricultural, livestock, forestry and mixed farming.

The most important characteristics of each of them should be specified - for example, whether agricultural systems are characterized by multicourse systems, and what combinations of crops, rotation, etc. are used. The following should also be indicated:

- technical-productive aspects such as irrigation, inputs, seeds, controls;
- the type of management carried out;
- productive practices and management and their impact on natural resources and the environment; and
- the participation of men, women and children throughout the agricultural cycle.

### Expected outputs

The analysis carried out through the overlaying of maps, secondary information, observation and interviews will provide the basis for spatially locating the main bottlenecks, whether they pertain to the population, production or the natural resource base. At this stage in the diagnostic, the expected outputs include:

- Identification and spatial location of productive, technological and renewable natural resource management problems, and how they relate to the forms of social organization of production, productive systems, and production.
- Spatial location of the forms of social organization of production and their main characteristics: whether they are natural; their scale; their products; production systems and their links with production chains.
- Classification of commercial and small farmers.
- Relationships between the forms of social organization of production: cooperation, conflict, complementarity and competition.

Other categories can be added to the above, according to the emphasis required for each particular situation.

In short, the overall results of the type of analysis proposed in this section should lead to the identification and localization of specific

problems and the potential that exists. This makes it possible to characterize both key population groups and their immediate context, and the particular problems that they face. Naturally, this type of output will facilitate the work of a subsequent stage in the MPP process, when specific programs are defined to resolve given problems. The target group and/or specific thematic problems that are to be solved must be carefully selected.

Some of the "critical" variables will vary depending on the characteristics of each microregional situation and the importance that the population attributes to them. The following are some of the variables that are often regarded as critical and can be used as a baseline for defining those that each team decides: employment and agricultural and non-agricultural income, land tenure, technology, credit, production support services, education, health, etc. A set of the variables selected for the final analysis can in turn be combined to evaluate their combined impact and presented on a single map.

### Spatial system of trade and markets

The core objective of this section is to analyze the fluidity, intensity and organization of trade in the microregion with respect to both agricultural, forestry and industrial products and services and labor.

To do this it is necessary to complement the information contained in the pertinent map with secondary information, interviews and direct observation.

Some of the aspects that need to be characterized are:

- Marketing chains. In this case, agri-food chains in the sense of sets of agents linked through trade relationships and a group of techniques that are linked to produce a finished product. (Bourgeois 1996).
- This operating definition of a chain thus involves a product or group of products that are transported and traded within well defined geographical spaces for specific periods of time (product, space and time);

- The flow of trade in products, services, manpower, etc., within the microregion or, if necessary, between the latter and other neighboring spaces;
- The prices of the main products and inputs, with a rough estimate of the profit margins.
- Estimates of the global marketing indexes of agricultural production based on the percentage of on-farm consumption/sale of products.
- A description of the functioning of the market in the microregion, i.e. the degree to which it is modern or traditional: monetary or non-monetary exchanges, the formal and nonformal credit system; forms of organization of production and price-setting; the importance of networks of relatives or friends; the importance of fairs, in terms of their number, volume and the types of products traded.

### The land market

- A succinct description of the social organization of trade, based on the analysis of the role played by population centers. In doing so, it is necessary to identify the economic importance of the main population centers and their role as financial mechanisms, and as mechanisms for the collection and "export" of products. It is then advisable to establish the relationships among the population centers and the nature of the relationship between them and the rural milieu.
- As far as possible, to make a rough inventory of the number of the most important business establishments in rural areas, their main characteristics and location (market, shop, stall). This inventory can be enriched with a general idea of the specialization of the activities of each of them and the level of organization of the traders.

This part of the diagnostic should provide a description of the conflicts and potential vis-a-vis trade in the products, goods and services of the microregion, paying special attention to its social organization, fluidity and economic importance, the degree of institutional modernization and the possible articulations with other microregions.

This analysis will be complemented with the information on infrastructure. To this end, the map of markets will be superimposed on the infrastructure map and the chief bottlenecks and potentialities for marketing and trade identified.

The basic aim of this section is to provide a vision of the economic dynamism of the microregion and its links with other spaces. To achieve this, the analysis links characteristics related to natural resources, production and the underpinnings of the transportation of, and trade in, merchandise, and defines and pinpoints the problems and potential of each of the dimensions discussed.

### Social development

The basic objective of this section, which complements the previous one, is to call attention to the importance for sustainable development, in methodological and management terms, of the treatment that must be given to a set of topics related to human resources (population), therefore characterized as social, and usually dealt with independently from issues or problems related to the productive, economic and political dimensions.

Undoubtedly one of the most obvious manifestations of underdevelopment in the rural sector is the population's lack of access to certain basic services, such as education, health and adequate housing. For the rural milieu to be transformed, obstacles of this kind must also be overcome in order to ensure that there is a stock of healthy, educated human resources capable of playing a dynamic role in the development process with a long-term vision. This truism and the need to interrelate social, productive and economic variables are concepts that, generally speaking, are applied to the urban populations of most countries, based on the premise that well-educated human resources make it possible to develop or consolidate competitive advantages in various sectors of the economy, such as industry and services.

However, this argument is equally valid for the rural population, as any sustainable development proposal will only be successful if it

manages to attain objectives that improve well-being in the short run, while simultaneously strengthening competitive skills in the long run. If the population's skills are improved and diversified, it will enjoy greater access to employment opportunities and be guaranteed better prospects of obtaining a higher income.

The indicators related to this type of problem concern the population's access to services such as the following:

- education: adult literacy rates, average educational level, type of education available in the area.
- health: access to health services and potable water,
- housing: housing shortfall and repairs to dwellings needed

The global indicator of economic and social conditions is the poverty level of the population (absolute and extreme).

For the purposes of this diagnostic, and subsequently for the design of the microregional development strategy, it is important to conduct a comparative analysis of these indicators and their national and regional averages in order to evaluate the relative development of the microregion in question. The most readily available sources of basic information for calculating these indicators are the public institutions responsible for social programs and the execution and analysis of population censuses, and the agencies in charge of carrying out household surveys.

### **Political and institutional situation Organizations, institutions and actors**

Experts agree on the decisive role that regional and local public institutions and NGOs are called upon to play as agents of development. Indeed, the level and type of presence of such entities in the different territorial spaces are crucial to the success and sustainability of regional and microregional public programs.

Institutions, organizations, associations and local leadership are also viewed as key elements in this methodology. They make it possible to identify the dynamics of the microregion and provide the basis for designing microregional development strategies.

With this in mind, the team must gather the following information:

- Local, microregional or regional government.
- Public entities operating in the region.
- Private development organizations that are active in the microregion, indicating whether they are local, regional or extraregional.
- Business, commercial or small-farmer organizations and associations.
- Trade unions.
- Credit, savings and loan institutions.
- Other organizations regarded as important for the successful management of activities at the microregional level.

### **The information that should be obtained in each case is as follows:**

- Length of time that they have operated in the area.
- Amount of financial resources that they have managed during the previous three years. Special emphasis should be placed on municipal governments and public institutions with responsibility in the microregion. Their sources of income should be analyzed.

The following table is an example of how to present and analyze the financial data of the institutions regarded as important agents for promoting local development.

**PUBLIC BUDGET OF THE MICROREGION**  
(Real expenditure in thousands US\$)

	1993	1994	1995	1996
Municipality 1 Operating expenses Investment				
Municipality Operating expenses Investment				
<b>Total MICROREGION</b>				
Operating expenses Investment				

In addition, this part of the analysis should incorporate a brief summary (table) of:

- Development plans and projects that are either ongoing or scheduled for execution within a period of less than one year; with information on the funding and technical cooperation agencies, target population and local organizations involved, the role of local government, main components, type of activities, human and financial resources allocated to the project.
- Central government spending in the microregion by principal item of expenditure, especially for municipal expenditure (matrix).
- Staff strength.
- Physical infrastructure.
- Population catered to/number of members.
- Population's perception of their effectiveness and importance.

**Conflicts, alliances, complementarity among the different organizations**

**Positioning of the local government**

- Position of the microregion in the political and administrative structure of the country.
- Duties assigned to the municipalities under national legislation.
- Characteristics of the municipalities located in the microregion: leadership, degree of acceptance, operations; relationship between them; linkages with other government entities with operations in the region; type of activities that they carry out; provision of equipment; municipal management. Existence of schedules of activities and/or development plans.
- Areas of cooperation and conflict between the public and private sectors.
- Qualitative assessment of the leadership in the different areas-associations, economic, political, cultural, etc.

The aim of this part of the diagnostic is to make a qualitative assessment of the organizational and institutional dynamics of the local government and the microregion and, based on this analysis, to evaluate its capacity to design and execute proposals that answer short and medium-term needs and are also consistent with a long-term vision.

A qualitative appraisal of the main hierarchical relationships between the local government and other regional or national public sector institutions should also be made in order to gain a clear understanding of their natural interactions with the rest of the institutional system and, at the same time, to determine the degree of real autonomy of the local government.

## Summary of the main inter-microregional relationships

In addition to the specific work related to the unit of analysis per se, it is necessary to characterize the principal relationships between this and other microregions. Some of these are as follows:

- i. **Economic and productive.** One example would be agroindustrial units or centers in need of agricultural products derived from primary productive enterprises, i.e. processing of raw materials, the transformation of products, packing operations, mills, refrigeration facilities, etc., with which certain producers are articulated through the sale of their primary production.
- ii. **Institutional.** A brief description of the functional relationships between the main institutions linked to the sector whose headquarters or regional offices are located outside the microregion.
- iii. **Ecological** -such as microwatersheds, reserves or conservation areas shared by several microregions. In this case the relationships are obvious and pose a common challenge for resolving the existing problems and/or the potential for executing joint activities for the collective development of the areas in question.
- iv. **Social.** These would include large-scale emigration or immigration.

The description of these relationships should characterize the type, the main productive agents involved, the institutional actors, the relative importance of these relationships for the microregion, its potential for development and the main bottlenecks that hinder it.

The analysis should highlight the possibilities of development and public or private investment whose radius of action goes beyond the limits of a microregion and, at the same time, offers the potential for consolidating nuclei for promoting development.

## PHASE IV.

### Principal trends through 2010

#### a. Prospective analysis

The aim of this part of the analysis is to generate an approximate image of the future scenario of the microregion in a decade's time. The basic premise of this approach is that the present situation, with its structural, technological, productive, organizational and ecological constraints, will remain largely unchanged during the period in question. That is, in the next decade (2001-2010) the principal transformations within the microregion will be little more than the result of a transposition of what is occurring at present, unless there are exogenous or endogenous interventions to promote change.

The analysis should focus on the possible disequilibria that the microregional system will face as a result of conflicts in the different dimensions and/or among them. In this case, the conceptual point of reference should be the stability of the microregional socioeconomic system, in each of its dimensions and as a whole. In other words, the prospective analysis should produce a future vision of the scenario in question, succinctly describing the destabilizing elements in each dimension and the probability of the system reaching the year 2010 in a state of stable equilibrium. Alternatively, it should describe in order of importance the chief components of the system, by dimension, that are conditioning or limiting the sustainable development of the microregion.

In order to arrive at this prospective vision, it is necessary to project the trends in the most important variables included in each of the dimensions analyzed. Clearly, this study will be based on a qualitative notion of the problem, and with respect to some variables, this projection will be based on quantitative information.

In the above context, the aim should be at least to evaluate the most important trends or constraints to the development of the microregion, including:



- a. Renewable natural resources.
- b. Social situation.
- c. Production and marketing, consumption-product chains, urban-rural linkages through services or other activities, and the relative importance of primary activities versus other sectors of the local economy. Possible emergence of new forms of production or articulation mechanisms among the various economic actors/agents in the different links in the chain.
- d. Maturation of the decentralization process, as reflected in the consolidation of the local government and the participation of civil society organizations.
- e. New institutional arrangements, modernization of the public sector and the role of the private sector.

Some of the variables that may be considered for this type of prospective analysis are presented below.

### **Renewable natural resources**

Management of the microregional space, determining possible areas of conflict in the use of natural resources -soil, water and forest-, such as deforestation, erosion, sedimentation. Primary productive activities may emerge, expanding towards areas of the agricultural frontier or being executed in areas whose potential use is not suited to them, due to disorganized urbanization processes and industrial and mining activities without precautionary ecological measures.

Great care should be exercised in the specific case of water resources, as in several countries this asset is in increasingly shorter supply and has become a bone of contention and even led to confrontations and conflicts between different users. This is because the cyclical supplying of water depends on exogenous climatic factors and, therefore, in most cases is difficult to manage,

unless resources are available for investment in irrigation projects. The demand for this resource for productive uses (agricultural, industrial, services) or human consumption. Water will undoubtedly be the chief productive constraint in any number of microregions located in ecological zones with long dry periods and/or limited rainfall, or which, because they are mountainous or have steep slope, make the proper use of water difficult.

Based on the information obtained, a map will be prepared graphically representing the principal characteristics of this resource in the future.

### **Social dimension**

In the specific case of this dimension, the efforts should focus on the population growth rate, emigration, and employment, income and poverty levels. Emphasis should be placed on the population pattern and important changes in population centers.

The aim of this part of the analysis should be to project the total urban and rural population, the labor force and trends in the major population centers.

- Land tenure and farm size according to the social organization of production.

Efforts should be made to project the trend in the type of farms that will predominate in the future, based on the changes that are being instituted with regard to phenomena such as dwarf holdings or efforts to incorporate small and micro units into larger farms. The implications of these trends for social well-being should also be evaluated.

### **Products, production and productivity**

This section should project the production of the principal commodities and the anticipated levels of productivity. Possible concentration on a small number of products not linked to the market

or, alternatively, a productive shift in the microregion away from products for on-farm consumption to products that can be traded in nearby markets.

### Trade and market mechanisms

In this case, the aim is to project trends in trade relationships and flows with other microregions and regions of the country.

### Social development

It is recommended that the following indicators be projected: life expectancy, access to health services and water, literacy rates and the housing shortfall. Likely shortfall in these services in the light of future demand. Spatial location of demand versus supply.

Basic physical infrastructure: roads, institutions, community facilities and production support services

The guiding principle in this case is that the microregion will only be competitive in global terms if it has a transportation and production support infrastructure. It is therefore essential to pinpoint possible bottlenecks that could arise as result of weaknesses in the system (energy, roads, telecommunications, research centers, irrigation, etc.) and the limits of development in the microregion.

The variables projected should then be integrated into a matrix designed to show the main interrelationships among variables, as shown on the next page.

### Summary of the diagnostic

The purpose of this part of the analysis is to link the different dimensions analyzed (natural resources, population, land tenure and farm size, production, market mechanisms, social development and infrastructure) with an overall vision, so as to gain a clear picture of the social and economic dynamism of the scenario and its development

Projection of the principal variables used in the diagnostic	
CATEGORIES	1980
<ul style="list-style-type: none"> <li>• Land use capability and future use</li> <li>• Total population</li> <li>• Urban population</li> <li>• Rural population</li> <li>• Farm type (future) (trend and size)</li> <li>• Production by principal product</li> <li>• Productivity</li> <li>• Trends in trade flows</li> <li>• Access to health services</li> <li>• Access to potable water</li> <li>• Adult literacy rate</li> <li>• Housing shortfall</li> <li>• Infrastructure needs productive Social</li> </ul>	1990
	2010

potential. The information can best be summarized in two matrixes: the first, known as the diagnostic summary, includes information on the principal problems and synthesizes the projections through the year 2010, as presented in the respective table.

**Summary matrix of the diagnostic**

**Purpose: to summarize the most important problems encountered and the most important conclusions for the future development of the microregion**

Dimensions of development	Princ. Problems and Trends	Interrelationships	General Projections Through 2010	Important Conclusions
Microregión *  • Natural Resources  • Population  • Land Tenure and farm size  • Production  • Trade mechanisms  • Social development  • Infrastructure				

\* This information should be specified for each subarea

The second submatrix emphasizes the most pressing bottlenecks and identifies areas with potential for public and private investment, as follows:

**Matrix of bottlenecks and potential of the microregion**

**Purpose: to identify the bottlenecks likely to hinder the future sustainable development of the microregion**

Dimensions of development	Important conclusions	Pressing bottlenecks	Areas with investment Potential	Ongoing programs and projects
Natural Resources  Population  Land tenure and farm size  Production  Trade mechanisms  Social development  Infrastructure				

Note : If necessary, this information should be broken down by subarea.

### Summary of inter-microregional relationships

The principal relationships between the microregion and other neighboring territorial units should also be summarized. The same categories of the diagnostic should be used for this exercise: i) economic and productive, ii) institutional, iii) ecological and, iv) social.

#### Matrix of inter-microregional relationships

**Purpose: to identify the principal relationships as the basis for the design of SMD proposals**

Categories	Type of relationship	Bottlenecks	Potential
Econ. and prod.			
Institutional			
Ecological			
Social			

This section should focus on the design of a provisional proposal for the sustainable development strategy for the scenario in question. The objective of this strategy should be as follows:

- To define the guiding role that will be played by the local government in the development process.
- To select two or three key products as the focus for the promotion of private sector investment and public credit, using criteria such as: activities that will create jobs and call for relatively little capital

investment, with important spread effects, the existence of easily accessible markets and marketing channels that are compatible with the agroecological systems into which they would be incorporated, easy access to appropriate technologies, etc.

- To focus public investment on activities in support of production around the same core products.
- To strengthen and simplify credit mechanisms for productive activities that complement the core products. These may be either agricultural or forestry or non-agricultural activities linked to other sectors of the economy.
- To ensure that one or more of the core products selected is/are directly linked to the activities of a third sector of the economy, in order to minimize the risk of the strategy focusing on a set of activities linked to only one market, thus exposing the entire microregion to the effects of market cycles. For example, linking primary horticultural production activities to the activities of the tourism sector.
- To focus public investment in health and education on a manageable selected number of population centers, endeavoring to equidistance the supply of such services from the spatial location of demand. One way of doing this would be to strengthen some population centers as the linchpins and nuclei of the development process, around which public investment in those items are ranked in order of importance. Naturally, certain criteria exist in each country with regard to the distribution and allocation of public resources. These must be respected or, if not, adapted to a global development proposal for the microregion.
- To make the alleviation of structural bottlenecks such as land tenure or titling a priority, as they make it possible to untie this Gordian knot and thus provide more efficient productive solutions.
- To strengthen and overhaul the public and private institutions involved in the proposed strategy in order for them to meet the challenge.

- To provisionally define the forms of production or the articulation mechanisms among them.
- To define the productive, conservation or preservation areas that should be considered prior to the selection of the core products and the areas in which they are to be promoted.
- To provisionally identify the components of the strategy that could link the activities of two or more microregions.

The recommendations made should be based, especially, on the productive potential identified, endeavoring to rank in order of importance global areas for investment to resolve specific problems with a long-term vision, and on consultations with local officials and community leaders.

The proposals that are suggested can be summed up in a matrix such as the one presented below:

Matrix of Provisional Guidelines for Sustainable Development	
Dimensions	Plan of Action
Natural resources	
Population	
Land Tenure and farm size	
Production	
Trade mechanisms	
Social development	
Infrastructure	

The list of provisional ideas for projects can also be presented in a summarized fashion, as follows:

Matrix of ideas for projects		
Dimensions	Types of ideas for projects	Financial resources required
Natural resources		
Population		
Land tenure and farm size		
Production		
Trade mechanisms		
Social development		
Infrastructure		

The ideas for projects should contain the following information, summarized in documents that should run to no more than two pages:

- Name of the municipality or municipalities
- Name, location and brief description of the project
- Status of the project (idea, profile, prefeasibility study, etc.) and name of the executing agency where appropriate.
- Amount of resources required for the project.

## APPENDIX

### METHODS FOR SUPPORTING THE TRAINING OF THE INTERDISCIPLINARY WORKING TEAM

#### INTRODUCTION

Implementing the methodology for the microregional diagnostic calls not only for the work of the team of professionals and institutions that organize and manage it, but also the involvement and collaboration of other people in the communities where the methodology is to be applied.

To facilitate the execution of the work and support the attainment of the objectives proposed, three didactic exercises are included to guide the development of the critical and analytical thinking required to draft strategies and actions related to each of the dimensions considered in the methodology for the microregional diagnostic. These exercises are based on socialization processes, such as group work for problem analysis, and cover the two phases of the learning process: individual learning and group learning, when what has been learned is socialized.

The three didactic exercises proposed are also interrelated to strengthen the integration of the work: the first, linked to the glossary, emphasizes the conceptual explanation. Having clarified this aspect, the second exercise entails the application of these concepts, albeit still at a highly abstract level. The third exercise provides an opportunity to contrast the conceptual considerations with the actual situation in each microregion, represented on the cartographic material that will have been produced. In all three cases, the resulting material should be used to systematize future experiences in order to make the pertinent adjustments to both the methodology and the didactic exercises themselves, perform evaluations and provide feedback to the entire process.

## GENERAL OBJECTIVES OF THE DIDACTIC EXERCISES

- To understand and support the process involved in applying the methodology for the microregional diagnostic.
- To contribute to the theoretical development, through the knowledge acquired from the group activities and specific individual experiences, systematized with regard to the objectives of this work.
- To identify the ways in which people learn, that is, their particular cognitive functions, so that the didactic and working experiences can be organized accordingly and achieve the proposed objectives.

## DIDACTIC ACTIVITY 1 GLOSSARY

### INTRODUCTION

This glossary was prepared to aid comprehension of the core concepts contained in this document, and also to provide an opportunity to review the definitions of the terms included, and develop new ones. For this reason, rather than a definitive list of terms the glossary is intended as a methodological contribution to the conceptual discussion and the sharing of ideas by the people who use it.

It is not intended to provide hard and fast definitions of the terms that it contains, but rather to elicit from the participants other interpretations that are possibly being developed in the different spaces where the diagnostic methodology for sustainable microregional development is applied.

It is important, however, to clearly define the basic elements of the core concepts used to integrate the theoretical dimensions of the topic.

Accordingly, space is provided under some of the definitions contained in the glossary so that others can be included or those offered rounded out, and didactic activities have been prepared to complement this process.

### A

#### AGRICULTURAL FRONTIER

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.....  
.....

**AGROECOLOGICAL**

Related to the development of agroecosystems, biofactories or biotrons under controlled conditions, produced by modern technology. Agroecosystems are crops that man creates in the natural milieu in order to exploit soil resources in a sustainable way. It is characterized by the diversity of products and the use of integrated pest control, organic waste and crop rotation.

Some examples of agroecosystems in the microregion under consideration are:

.....  
.....  
.....

**AT-RISK, HIGH-RISK OR ENDANGERED ECOLOGICAL AREA**

When an area (or sub-area) is characterized as being "at risk," this means that the existence of a particular danger has been identified within it, and that it is likely that this danger will have to be faced at some point. If the probability is high, the area may be classified as a "high-risk area."

An endangered area means one in which the contingency is only a potential threat to the inhabitants and the environment.

Both "at risk" and "endangered" areas can be ranked according to the probability that the danger will actually occur, so as to determine the risk.

**AVERAGE-SIZED PROPERTY**

(Elements for determining what this is in the case of the microregion under consideration)

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.....  
.....

**B**

**C**

**D**

**DATA BASE**

.....  
.....  
.....

**DEVELOPMENT**

A social process characterized by the expansion of productive capacity and a rise in per capita income, and by changes in the social structure and organization; as well as positive cultural transformations and the development of new values; the democratization of society through modifications to the political and power structures, all of which results in a higher level and better quality of life for human beings. The characteristics of this process depend on the biogeographic, sociological, economic, political and historical conditions of each country or region.

**E**

**ECONOMICALLY ACTIVE POPULATION (EAP)**

Defined as the segment of the total population that provides labor for the production of goods and services. Within the EAP, a distinction may be drawn between those people who are actually employed and those who are unemployed or seeking employment for the first time.

**EMIGRANT(S)**

A person or group of persons who leave a place, also referred to as out-migration. Generally speaking, such persons can be classified according to the length of time that they are absent, the distance and organization; these criteria are not mutually exclusive but rather complementary. Thus, there are seasonal, temporary, periodic and permanent emigrants.



**ENVIRONMENT**

In addition to the milieu as such, this term encompasses the circumstantial conditions that surround individuals or things. These circumstances may be physical (cold, heat, humidity, dryness, noise, light), social or psychic (wealth, poverty, ignorance, sadness, happiness, etc.), biological or natural (the tropics, mountains, desert, tundra, etc.) and anthropogenic (urban, rural, industrial).

**EQUITY**

A global concept that articulates the elements of the social, institutional, regulatory, legal, cultural and ideological structure with the condition and access of individuals and groups to opportunities for development, in accordance with their potential. The latter is determined by the effective rights that individuals enjoy or are being denied.

**F**

**FARM OR PRODUCTIVE UNIT**

.....  
.....  
.....

**FORM OF SOCIAL ORGANIZATION OF PRODUCTION**

.....  
.....  
.....

**G**

**GENDER**

Social category that transcends the biological differences between the sexes, focusing on the role differences and inequalities that exist between men and women on account of the socioeconomic context, historical and political conditions, cultural and religious patterns, and different societies within which they interact. While sexual differences are biological and more permanent, those of gender are diverse and transformable, in accordance with the specific development of each society.

**H**

.....  
.....  
.....

**I**

**IMMIGRANT**

Person or group of persons who enter (arrive in) an area, region or country from another. Not the same as visitors, but the latter may decide to remain permanently or for a lengthy period; they then become immigrants.

**INTERDISCIPLINARITY**

Interdisciplinarity criteria propose new perspectives in human knowledge, as at both the methodological and practical levels the dividing line between the exact and human sciences is no longer sustainable. The following requirements must be observed for interdisciplinary work: unity, relationships and reciprocal actions, interpenetrations among different branches of knowledge, i.e. each discipline is not limited to its particular specialty, the rapprochement between disciplines leads to two-way exchanges and produces results. Therefore, to the mutual development of the different disciplines involved.

**J**

**K**

**L**

**LABOR FORCE**

The basic, active element of production; the capacity of men and women to produce the material and intellectual goods that they require.

**M**

**MUNICIPALITY**  
 .....  
 .....  
 .....

**N**

**NATURAL RESOURCE**

Any factor of the natural environment that can be harnessed by humankind, such as water, air, soil, minerals, mountains, relief, animals and wildlife of every kind. If these resources can be regenerated, they are said to be renewable.

**O**

**P**

**PLANT COVER**

Refers to the area occupied by one or several types of plant formations, their characteristics and interrelationships.

**POPULATION DENSITY**

Population density is a means of classifying the different forms of spatial occupation and can be used to make comparisons between areas with similar natural conditions. It expresses the ratio of the population to the surface area. It is obtained by dividing the total number of inhabitants of the selected unit of surface area by the total number of square kilometers.

**POPULATION GROWTH RATE**

Numerical expression of the proportional increase in the population over a period of one year, excluding spatial displacement. Roughly speaking, it is obtained by subtracting the gross mortality rate from the gross birth rate.

**POVERTY**

A concept that forms part of a long tradition of theological, philosophical, political and economic thought. It should be linked theoretically with social inequality and economic growth and development theories. It may be said that poverty is the way in which social inequality is manifested.

**PRODUCTIVITY**

In economic terms, this is the relationship between production and inputs. It is equal to the quotient between the amount of production and the number of resources used or consumed.

**Q**

**QUALITY OF LIFE**

In general terms, this concept can be explained in any one of three ways: in merely economic terms, relating the quality of life to the possibilities of consumption; in ethical terms, which includes aspects such as civil liberties, justice, freedom of thought, human rights, education, culture and art; or in ecological terms, calculating it in terms of factors such as health, access to clean air and water, and recreational activities in a natural setting.

All these tangible and intangible factors that make up the quality of life are strongly influenced by personal and family relationships, interactions with the community, economic income, job satisfaction and security, the positive use of spare time and, in the long run, the sustainability of development.

**R**

**RATE**

A coefficient that was first used to indicate the relative frequency with which an event occurs, as part of a given group of events, with-

in a specific period of time. However, this term has acquired many meanings, the only common element being that of a ratio. Many rates or coefficients are expressed in percentages.

#### REGION

A territorial division determined by ethnic, climatic, political and other characteristics that are interrelated and provide the space with certain common features, distinguishing it from others.

### S

#### SOCIAL ORGANIZATION OF PRODUCTION

The way in which a society is organized to carry out the process and create the means of production and objects for personal use needed for their existence.

#### STRUCTURE

Reciprocal, stable connection and relationship, subject to laws between the parties and elements of the system as a whole.

Other concepts to be defined:

#### SUSTAINABILITY

A set of planned actions aimed at the maintenance, renewal and strengthening of renewable natural resources, so that their use is rational, technical and in accordance with optimum utilization, to achieve the quality of life to which a given society aspires.

#### SUSTAINABLE MICROREGIONAL DEVELOPMENT (SMD)

Defined as the process of transforming these territorial units, based on a national strategy and ad hoc policies designed specifically to overcome the factors responsible for spatial, political, social, economic and institutional disequilibria that bridle the full development of the

rural sector and limit the effective participation of its population in the benefits of the development process.

At least three common core concepts of Development, Rural Development and Sustainable Rural Development are identified and noted below

#### SUSTAINABLE RURAL DEVELOPMENT (SRD)

A multidimensional process, the objective of which is to promote the improvement of the rural milieu, reordering the use of space and simultaneously improving the mechanisms for access to natural resources and making their rational use possible. As such, this concept integrates the political/institutional, socioeconomic, productive/technological and ecological dimensions. It also places the concept of sustainability at center of the process and creates the triad of competitiveness-equity-sustainability. The latter transversely intersects all the components of any rural development strategy and proposes a spatial vision of the process. It also modifies the traditional rural development paradigm; instead of small farmers, the focus of action is a specific space in which they carry out their activities together with other social/productive actors; hence the term "Sustainable Microregional Development."

### T

### U

#### URBAN HIERARCHY

Classification of urban centers, usually from smaller ones to larger ones, in accordance with their size, population, function and stage of development.

#### URBAN NETWORK

Network of urban nuclei, made up of the means of communication and the functional relationships that interconnect them.

V

VARIABLE

In a specific case or phenomenon, the value of something characteristic, whether quantifiable or not, that changes within the same units. Variables are important theoretically speaking because, together with the indicators, they help to give form to the characteristics of the concepts.

W

WATERSHED

This refers to the surface area drained by one or more rivers, their affluents and sub-affluents and interior lakes, if such exist.

Also, a drainage region or area in which rainfall is collected and channeled toward the lowest level, forming creeks, streams and rivers that flow into lakes or seas. The limit of a watershed is defined geographically by the dividing line between waters, above which they flow in the opposite direction.

For example, the microregion being studied includes the following watersheds and sub-watersheds:

.....  
.....  
.....  
.....

X

Y

Z

**DIDACTIC ACTIVITY 2  
SHARING MEANINGS AND DEVELOPING  
COMMON LANGUAGE**

OBJECTIVES

1. To identify and define the basic elements of the principal concepts of the subject.
2. To foster understanding of the concepts described and identify interrelationships among them.
3. To encourage analysis of and reflection on the theoretical framework that underpins the practical application of this methodology.

**PREPARATION OF A SEMANTIC MAP**

MATERIALS

The document "Sustainable development: Methodology for conducting microregional diagnostics," large sheets of paper, marker pens and adhesive tape.

APPROXIMATE TIME REQUIRED FOR EXECUTION

Between 60 and 90 minutes.

INSTRUCTIONS FOR EXECUTING THE ACTIVITY

Divide the Document "Sustainable development: Methodology for conducting microregional diagnostics" into sub-topics, in accordance with the proposed criterion and objectives. Divide the group of participants into the same number of sub-groups in order to assign a sub-topic to each one. In sub-groups, and with the sub-topic assigned, carry out the following activities:

- Carefully read the document, identifying and noting down the integrating concepts that are fundamental to its understanding.
- Note down the concepts in the order that they appear in the document.
- Once this exercise has been completed, list the concepts in order, beginning with the most general and all-encompassing and ending with the most specific.
- Establish linkages among the concepts and interconnect them with lines and strokes.
- Create groups of concepts built around those that are identified as being the core or pivotal concepts of each group.
- Note down the pivotal concept and then others that are derived from them, so as to form "families" of concepts. For example,
  - sustainability
  - equity
  - ecology
  - environmental crisis, etc.
- Establish linkages among families of concepts, using arrows.
- Once the semantic map has been completed, review it and copy it on to a large sheet of paper or cardboard, in order to explain it to the entire group.

The group then reassembles and each subgroup:

- Presents the semantic map that it has drawn on paper in order to explain to the group the interrelationships among the concepts of the sub-topic that it studied.

- Attaches its semantic map to the wall or board and, with the rest of the group, proceeds to establish the relationships among the core concepts of each sub-topic, using lines and arrows of a different color from those used previously.
- The person responsible for facilitating and guiding this work should note down the principal observations, doubts, and conclusions in order to organize them and distribute them among the group and round off the activity by observing the different perceptions of common topics. This last stage will also provide feedback on the process for the professionals who organized it.

### DIDACTIC ACTIVITY 3 IDENTIFYING AND LOCATING THE BOTTLENECKS IN THE MICROREGION

#### OBJECTIVES

1. To identify the characteristics of the microregion represented on the series of eight maps: six dealing with the dimensions and two summary maps.
2. To conduct a critical reading of the cartographic material to establish interrelationships among the most important variables that they represent.
3. To identify and locate the bottlenecks in the microregion, or at least the areas where they could occur.

#### MATERIALS

- The maps of: renewable natural resources; the spatial distribution of the population; land tenure and farm size by form of social organization of production and production system; physical infrastructure: roads, community facilities and production support services; and the system of trade and markets of products, services and inputs. Also, the two summary maps: the one dealing with socioeconomic aspects and the other on natural resources.
- Sheets of paper, pencils or pens. Transparencies, special marker pens and an eraser.

**APPROXIMATE TIME REQUIRED FOR EXECUTION:**  
From 60-90 minutes.

#### INSTRUCTIONS FOR EXECUTING THE ACTIVITY

1. In a group, select the maps for pairing, according to the variables that they represent and the possibilities of integrating them. Pass out the pairs of maps and the materials.
2. In subgroups, carefully study each pair of maps to establish the criteria for the selection of linkages, the identification of spatial and production problems, and others regarding the establishment of population centers, the use of natural resources, communications, etc., within each microregion and with reference to the topics of the variables graphically represented in each pair of maps.
3. Once the possible bottlenecks have been identified on each map, reproduce them on transparencies or the areas spatially represented on the maps, using a different color marker pen for each map. Then overlay the drawings in order to find relationships among the two cases.
4. In a table, note the following:

Name of the maps	Variables considered	Description of bottleneck

Description of a possible strategy for solving the above:

a -----  
-----  
-----

b -----  
-----  
-----

5. Each subgroup presents its table to the rest of the group, explains the situations that it found, and seeks possible interrelationships among its case and those of the other subgroups. This makes it possible to develop a clearer and broader vision of the possible bottlenecks in the microregion and it is easier to identify the possible causes and solutions.

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