



Deutsche Gesellschaft für
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SUSTAINABLE REGIONAL DEVELOPMENT METHODOLOGIES FOR MICROREGIONAL DIAGNOSTICS Literature Review



Sergio Sepulveda
Richard Edwards

AREA OF CONCENTRATION IV
SUSTAINABLE RURAL DEVELOPMENT

WHAT IS IICA?

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialized agency for agriculture of the inter-American system. The Institute was founded on October 7, 1942, when the Council of Directors of the Pan American Union approved the creation of the Inter-American Institute of Agricultural Sciences, to be headquartered in Costa Rica.

IICA was founded as an institution for agricultural research and graduate training in tropical agriculture. In response to changing needs in the Americas, the Institute gradually evolved into an agency for technical cooperation in the field of agriculture. These changes were officially recognized through the ratification of a new Convention on December 8, 1980. The Institute's purposes under the new Convention are to encourage, facilitate and support cooperation among its Member States so as to promote agricultural development and rural well-being.

The Member States participate directly in the Inter-American Board of Agriculture (IABA) and the Executive Committee, the Institute's governing bodies, which issue the policy guidelines executed by the General Directorate. Today, IICA has a geographic reach that allows it to respond to needs for technical cooperation in the countries, through its Technical Cooperation Agencies and five Regional Centers, which coordinate the implementation of strategies tailored to the needs of each region.

The participation and support of the Member States and the relations IICA maintains with its Permanent Observers and numerous international organizations provide IICA with channels to direct its human and financial resources in support of agricultural development throughout the Americas.

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 three aspects of agriculture: production, trade and institutions, using an integrated approach to development which is based on sustainability, equity and competitiveness. IICA carries out its technical activities in four Areas of Concentration: Socioeconomic Policies, Trade and Investment; Science and Technology, Natural Resources and Agricultural Production; Agricultural Health; and Sustainable Rural Development. IICA's actions receive support from two Specialized Services: Training, Education and Communications; and Information, Documentation and Informatics.

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2

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PREFACE

This publication is part of IICA's efforts to strengthen and update its rural development conceptual and methodological framework. In fact, the Institute is extensively upgrading its work instruments in order to improve its efficiency in areas pertaining to technical cooperation such as strategy design, policy/programs formulation and project preparation.

It is important to underline at the outset that rural development is conceived as a multidimensional process to promote the reordering of the use of space, improve the social equity and the access to resources, and ensure a rational use of renewable natural resources. As such, it is a development process that integrates social, economic, institutional and ecological dimensions. Placing the concept of sustainability at the forefront, and cutting across the rural development strategy, results in a fundamental shift in the paradigm; this conceptual approach has been labeled as *sustainable microregional development (SMD)*.

The SMD concept explicitly incorporates the socio-economic, political-institutional, productive-technological dimensions of sustainability and it is conceived to ensure a long-run sustainable natural resource management. From this multidimensional perspective the SMD conceptual framework and its working instruments have been molded closely to those germane to social equity, ecological sustainability, government modernization *cum* decentralization and productive competitiveness.

In fact, conceptually, the sustainability and equity issues have been defined as unequivocally linked; the development process can not be sustainable if it does not ensure equitable distribution of, and access to, resources and to the benefits of development. Furthermore, it is important to emphasize that both issues, sustainability and equity, require as a

cornerstone a far-reaching access to political participation at the local, regional and national levels.

This publication is an extensive bibliographic review of diverse methodological approaches to partially manage a few dimensions of a "spatial diagnosis". Nonetheless, the work concentrates mostly upon those references published during the last several years in Latin America, The Caribbean, the U.S., and Canada. This assessment permitted the confirmation of the hypothesis formulated at the outset of this undertaking:

"there is a conceptual vacuum in the design of rural development strategies and diagnosis that coherently integrate the aforementioned dimensions".

In fact, none of the references analyzed herald a systematic and multidimensional approach to spatial development; on the contrary, all of them focus on partial visions of the spatial reality.

In view of this fact, the Institute appointed Orlando Plaza and Sergio Sepúlveda to undertake the task of developing a multidimensional methodology for a "territorial unit diagnosis". Thus, these professionals became involved in the design of a methodological approach for microregional diagnosis. They initiated activities to the Colca Valley in Perú and Purranque county in Chile in May 1994, with total support from national and regional authorities: The Secretary of Agriculture in Perú and the National Institute for Agricultural Development (INDAP) in Chile. Furthermore, in order to thoroughly develop this activity they opened strategic alliances with two NGO's —Centro de Estudios y Promoción de Desarrollo (DESCO) in Perú and Grupo de Investigaciones Agrarias (GIA) in Chile—, in addition, these institutions strengthened their technical linkages with Catholic University, National University in Arequipa in Perú and CIREN/CORFO in Chile. In synthesis, a difficult technical challenge was transformed into a delightful experience through a multidisciplinary team of professionals. This bibliographic review is the first phase of this undertaking.

The objective of this document is to provide the field staff directly involved in diagnosis, strategy, policy and project design, with a set of "specialized references" to understand the dimensions of a complex framework to execute a microregional diagnostic for sustainable rural development. These readings seek to complement the methodological

document on microregional diagnosis for sustainable rural development that the Institute is preparing.

Several organizations and individuals have assisted the authors in their quest for precise information; there is no doubt that without their support the work would have been fruitless. These contacts and assistance were crucial at a moment when the Institute computer network had not yet been connected to INTERNET, so the procedures followed were old fashion. We are grateful to both, institutions and individuals, and to ensure that they become permanent references to all those interested in SMD, their names and addresses have been included in the first appendix of this publication.

This document is part of a series of publications that the Rural Development Program and the GTZ-IICA Project have conceived in order to provide professionals with an easy access to the most recent information available on this topic and, at the same time, to contribute to building a set of practical working devices to ensure efficient service to rural people.

To all those readers who share the Institute's interest in sustainable rural development and dream about an improved future for the rural population, the authors would appreciate their comments and suggestions about additional sources of information in order to assist us in improving this "first draft".

The material presented has been ordered in the following fashion: the first chapter provides a succinct review of the IICA's main conceptual underpinnings for sustainable microregional development; the next chapter concentrates upon that material dealing with detailed descriptions of the main methodologies used for diagnostics, these include practical guidelines which discuss planning, analysis and evaluation procedures to be undertaken prior to, and during, the actual fieldwork; the third part is a collection of diagnostics with detailed descriptions of their methodologies, although different phases of the process are emphasized in each one. The following chapter consists of diagnostics with limited explanations of their methodology, which can be useful as examples, since they were chosen because of some unique aspect not found in any other references; the material presented in the final chapter deals with conceptual sustainable development references pertaining to a wide range of ideas about the theme .

Finally, depending on the type of document reviewed, the bibliographic cites have been ordered in the following fashion:

- Author(s) or editor(s).
- Publication date.
- Document title.
- Translation of the document title.
- Place of publication.
- Publisher.
- Number of pages in document.
- Library where the document can be found. The three libraries most utilized to complete this work are located in Costa Rica in the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), the IICA headquarters, and the GTZ library within the IICA.
- Summary of the document, or of the part of the document most pertinent to the theme of the work.

CHAPTER I

I. SUSTAINABLE MICROREGIONAL DEVELOPMENT

A GLIMPSE AT SUSTAINABLE RURAL DEVELOPMENT

The spatial vision and the territorial management concepts of sustainable rural development spring out of the latest theoretical and methodological developments of regional economics, and is also fed by some elements of modern geographical science. In turn, both of them are driven by the desire to solve the socioeconomic problems rooted in their spatial location, for which mathematical modeling is utilized. Within this context, the major preoccupation of these sciences is the design (sketching out) of regional and national policy, in order to correct income and production imbalances, as well as to improve inefficient transportation systems. The global objective driving these types of theories is the improvement of national societies ¹.

On the other hand, these sciences pay special attention to the analysis of economic and ecological systems, creation of groups (coalitions) which aim to enhance their negotiating and conflict solving power. This emanates from the accepted fact that social actors react to many factors in their decision making processes, especially those pertaining to social and political relations.

1 Gore Charles. (1994) Regions in question. Space, Development Theory and Regional Policy. Methuen and Co. New York. New York.

In addition, the market is the leading force behind the sustainable rural development approach presented in this document. Even though the traditional market elements are given much importance, there is a special treatment of the social actors involved in these scenarios. In this context, the concept of sustainable rural development, as it is presented heretofore, follows the regional development arguments², which imply a multidimensional vision of a dynamic process. In fact, this approach refers conceptually to changes within several dimensions: socio-economic, agro-ecological, institutional and political, as well as the interactions between them and their social actors. That is, there is a real shift toward a "rational" use and management of all the territorial units, (microregions), in order to achieve a long-run perspective: in fact, the changes encompass reallocation in the use of, and access to, the natural resource base; production increases and product diversification; a shift of political power toward the local government; a redistribution of the access to decision making processes; and, an equitable distribution of income generating opportunities.

Sustainable Microregional Development³, as IICA has labeled sustainable rural development, is envisioned as a conceptual framework to guide the design of national rural development strategies, policies and programs, providing the foundation to accomplish changes in the structural and functional causes inducing spatial socioeconomic disequilibria, and amend some of its detrimental tendencies, transforming the approach of the rural sector from a short-term to a long-term perspective.

National Sustainable Development

At the national level, the sustainable development approach emphasized the importance of market failure as a cause of natural resource degradation and the need for efficient resource use and, at the same time, recognized the ecological and distributional constraints of the

2 Boisier, Sergio. (1992). *El Difícil Arte de Hacer Región*. Centro de Estudios Regionales Andinos Bartolomé de las Casas. Cusco. Perú.

3 Plaza, Orlando y Sergio Sepúlveda. (1993). *Desarrollo Microregional una Alternativa Hacia la Equidad*. IICA. San José, Costa Rica.

economy and the important role that the institutions play in order to achieve effective environmental management. This conception reflects the importance of economic efficiency in natural resource use, but also stresses the distributional aspects of development, both between different generations and different social groups within the same generation. In this context, poverty is seen as a cause and effect of national structural imbalances, and any efforts to solve environmental problems will be thwarted unless a broader perspective is adopted.

The linkages between sustainable development and sustainable microregional development is a fairly obvious one; in fact, the second one is nothing but a spatial subset of the first. Thus, SMD has to be understood as a submatrix of a significantly larger process involving national and international factors and actors⁴.

Heterogeneity: Basis for a Spatial Approach

The prevailing development style has produced diverse type of effects, quite often entirely desired, and a few others completely undesired, in most of countries in LAC. Although, these effects become apparent in different time profiles (from a few months, to decades) they do delimit patterns of resource allocation, distribution of development benefits and natural resource management. In short, the style of development determines the spatial distribution of economic activities, territorial concentration of the population (urban centers) and the types of linkages between given territorial units and the rest of the country. In practice, this phenomenon has generated a process of spatial differentiation in which each microregion or region acquires specific productive/economic and socio-political roles as a functional component of a complex national development matrix. Furthermore, this spatial specificity has induced particular types of multidimensional linkages between diverse territorial units within a national space; in certain regions these linkages connote a relation of dependency, while in others they imply a dominant role.

The spatial differentiation and the kinds of linkages between regions have become evident via three characteristics of the socioeconomic and

4 Potter, Clive and Richardson, Julie. (1993). *Economics for Environmental Management*. Wye College. University of London. London. England.

political system: i. geographic concentration of economic activities and the population in a few territorial units; ii. centralization, in these territorial units, of the institutional system responsible for decision making processes and; iii. extreme disparities in the level of living conditions between those located in the latter territorial units and the rest of the population.

The differences established within the sociopolitical and economic systems become the point of departure for IICA's conceptual approach to sustainable rural development. In fact, the existing spatial and socio-economic heterogeneity installed within the rural sector, the institutional and political diversity of the local scenarios and the ecological differences of the territorial units, as well as the linkages developed by these units with the rest of the economy, provide the dimensions to construct the SMD conceptual and methodological foundations. The transformation in the main socio-economic, political and ecological relations and their trends help to establish a long-run alternative development solution; that is, the sustainability issues linked to sociopolitical and ecological dimensions are at the forefront of the Institute's proposal.

Quasi Definition

SMD is defined as a set of actions, oriented by a national strategy and policies, specifically designed to alter those factors responsible for the spatial, political, social, economic and institutional inequities and disequilibria inhibiting the full development of the rural sector, ensuring effective participation of the population in the benefits of the development process.

This approach recognizes market failures as one of the causes for the irrational use of the stock of renewable natural resources, but it also grants a crucial role to intergenerational, social and spatial constraints imposed by the national development model. Nonetheless, this definition emphasizes the importance of economic efficiency to promote sustainable development in the rural sector. It also recognizes the paramount importance of an equitable distribution of the access to the political, economic and social benefits of economic development.

Within this context, the SMD objectives transcend isolated activities, or even specific projects, envisioning the transformation of structural relations and trends responsible for rural sector socioeconomic inequities,

as well as the disarticulation of territorial units (microregions) from national economic development centers. This definition purports a multidimensional and long-run perspective, in order to ensure both a rational use of renewable natural resources and a sustainable socioeconomic and political development model.

Elements to Ensure Sustainable Rural Development

The central elements promoted to attain an enduring rural development process are those which:

- i. Strengthen the political, institutional, social and economic capacity and autonomy of each territorial unit;
- ii. Articulate the territorial units (microregions) to the regional and national economic and political systems on equitable and sustainable bases;
- iii. Ensure an equitable access to resource property rights and services;
- iv. Increase the possibilities and capabilities of the rural population to politically, economically and financially command their own development processes;
- v. Enhance the flexibility of the sustainable rural development strategy in order to make it adaptable to long-run dynamics;
- vi. Adequate this strategy to the socioeconomic, biophysical, institutional and political conditions.

Main Dimensions of Sustainability

The main dimensions of the process of achieving sustainability are presented in a capsular manner as the following:

- *Social dimension*

This dimension brings into analysis the principal instruments of social and economic policy, which may serve as a base for promoting new regional development opportunities. Another facet of this dimension emphasized here are the perspectives of the main actors in sustainable

rural development within their social scenarios, especially concerning social organizations, their interactions, and the associations between the civil society organizations and the local/regional government. In fact, this dimension is based upon the claim that "rural people" must be at the forefront of their own development process.

The understanding of the local social alliances and group conformation is central to the issues dealing with governance and empowerment; in fact, precisely depicting and understanding the social scenario is crucially important to improving the processes of participation and democratization in the governments of the various countries.

- *Ecological dimension*

This dimension arises from the postulate that the future of development depends on the institutional actors' and economic agents' ability to manage, within a long-run perspective, their renewable natural resources and the environment.

Thus, the conservation and preservation of flora and fauna is indeed at the center of the SMD approach. Within this context, any productive activity promoted under this development paradigm should have a set of ecological management parameters to ensure its sustainable use.

Hence, a perspective of long-run management of natural resources and the environment requires the delimiting of spatial units or territories, such as a region or a microregion, and also determines its productive potential and development possibilities.

- *Economic and Productive dimension*

This dimension refers to the productive capacity and the economic potential of territorial units (microregions) envisioned from a multisectorial perspective, thus including primary and secondary productive activities in the agricultural sector, as well as within other sectors of the economy.

Furthermore, an important part of this dimension pertains to economic and productive relationships engendered in the "markets"

within the territorial units. In simple terms, among other important elements, this dimension relates to the productive potential of agroecological zones and the inherent conflicts between the actual and the potential use of the resource base.

This dimension was conceived to define a long-run "conflict free" resource management strategy, promoting investments in agriculture and forestry production that maximize the use of "clean processes and inputs". In the same context, special attention is placed on "traditional technologies", specifying those which have a high yield potential and are usually free of negative external inputs.

- *Political-Institutional dimension*

Although the rural development proposal is focused upon a region and/or a microregion, it is clear that it requires adjustments within the political system at the national, regional and local levels. In fact, there has to be drastic adjustments in the distribution of political power toward the regional and local governments. The goal from this perspective is to significantly increase the opportunities and mechanisms for civil society participation.

In this context, the reinforcement of the county governments and regional institutions becomes of paramount importance to bolster the undergoing democratization and political processes of decentralization. This subliminal objective, within this dimension, is a change in the style and level of the presence of the central government in a given territorial unit. In this manner, while the organized community demands services and proposes alternative solutions, the government responds in an organic and systematic fashion.

This dimension also deals directly with the need to reshape the institutional framework to ensure the ongoing processes of modernization/decentralization of the public institutional system toward a microregional focus.

Furthermore, of significant concern are the roles and interactions of the public and private sectors, as well those instruments used to facilitate the participation of civil society.

The issue raised above pertains to one of the basic working hypotheses: "the need to increase regional, microregional and community autonomy", which is the core of this particular development concept. It is also a fundamental part of the search for a significant increase in a given central government's capacity to respond to different local or regional situations.

The multiple dimensions conceived as necessary for SMD have been translated into objectives of any strategy for rural development as follows:

- i. To transform the rural sector by building the foundation of a sustainable development process through:
 - strengthening their socio-political and economic autonomy;
 - improving and enhancing their linkages with the development "centers";
 - promoting the rational use of renewable natural resources;
 - multiplying joint activities of diverse productive agents;
 - facilitating the associations between the traditional and modern sectors;
 - taking advantage of potential common actions among public and private actors;
 - intensifying linkages between the primary productive sector and other complementary activities;
 - enhancing rural-urban linkages.
- ii. To offer a rational and efficient alternative to substantially diminish rural poverty, providing the basis for maximizing the synergy between social and economic policies.
- iii. To foster a decentralized institutional system.

Diagnostic for Sustainable Microregional Development

The construction of a realistic diagnostic is the premise for designing a reliable national rural development strategy, a set of policies, a program or a project. This enables the professionals and beneficiaries alike to detect, with a significant degree of accuracy, the "reality" of a particular spatial unit (microregion)⁵.

The diagnostic methodology for SMD has been conceived as one of the basic tools in a set of instruments the Institute is designing to provide technical cooperation in the formulation of rural development strategies, policies, programs and projects.

The methodological cornerstone is to build chronological scenarios (1980 and 1990) in order to depict the socio/political, institutional/organizational and economic/ecological dimensions and their trends based upon a set of already measured variables (census data or other existing complementary sources of information). These variables are compiled into a data base and with the assistance of a simple Geographic Information System (GIS)⁶ are mapped⁷ and analyzed.

This methodology has a pivotal role within the spatial and multidisciplinary approach to rural development; its objective is to equip professionals with a manageable work instrument, which was conceived to ensure the integration of the diverse dimensions of "territorial scenarios" under scrutiny.

5 Plaza Orlando y Sergio Sepúlveda. (1994). Metodología para el Diagnóstico Microregional. Proyecto IICA/GTZ. San José. Costa Rica.

6 IDRISI was the Program utilized in Peru and Chile. This Program was created by The IDRISI Project. The Clark Labs for Cartographic Technology and Geographic Analysis. Clark University. Worcester Massachusetts. USA.

7 This "dynamic diagrams" are called by some french geographers *corema*.

The methodology for SMD diagnostic was conceived as a set of instruments to perform this task within a given territorial unit⁸ from a distinct multidimensional approach. Its dominant categories are:

i. National level:

This level of analysis bestows special attention on the major exogenous and endogenous variables and /or factors affecting national and regional development. Moreover, the main region's heterogeneity and its own characteristics and interrelations with neighboring regions are granted relevant importance.

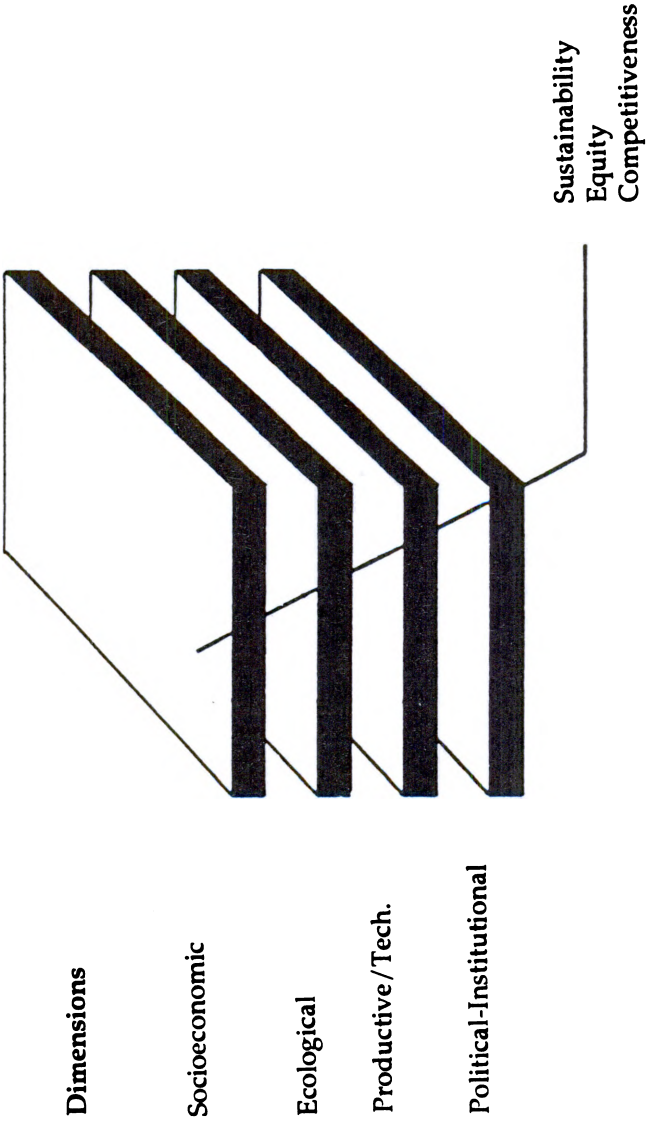
ii. Regional economic analysis:

- a. Economic: this refers specifically to primary and secondary production activities, marketing facilities, credit and technology as elements of the diagnostic. In doing so, this dimension emphasizes the microregional production potential and major bottlenecks.
- b. Socio-political organization: in addition to the major service supplies, special emphasis is placed upon demographic composition, ethnic groups, health and education. Additionally, a careful analysis of the private and public sectors, as well as mechanisms for joint ventures, is necessary. Local government and small urban center networks are also depicted and analyzed.
- c. The renewable natural resource base: the analysis is based upon existing agroecological information; thus, soil, vegetative cover and water resource bases are portrayed utilizing GIS. Furthermore, resource use conflicts are determined, as well as their main tendencies and causes, such as land tenure patterns and social organization.
- d. Economic activities and the main social and economic agents: in analyzing these factors, agriculture, forestry, animal production, agroindustry, commerce and services are characterized.

8 This spatial unit could be a microregion, a microwatershed, a county or a group of counties.

- e. **The institutional scenario: this analysis confers special emphasis on public and private institutions from the perspective of the various "actors" involved in development; therefore, local and regional governments, public institutions, base organizations, NGOs, and the private sector are some of the "institutional actors" focused on. In addition, special attention is granted to the existing mechanisms facilitating the interactions between the private and public sectors.**

To summarize, an attempt is made to delineate the trends of the four dimensions using information gathered in two different time periods, then proceeding to determine the conflicts and the potential of each region. These scenarios serve as a basis for the subsequent design of regional and microregional development strategies.



Synthesis of the Strategy of Sustainable Rural Development

CHAPTER II

METHODOLOGIES FOR DIAGNOSTICS

ALTIERI, M., 1990. *Environmentally Sound Small-Scale Agricultural Projects: Guidelines for Planning*, New York, CODEL, p. 162, GTZ- #23.

The manual covers the following subjects:

1. Introduction to important ecological concepts relevant to the development of agricultural projects.
2. Technical information related to environmental issues.
3. Some suggestions for planning small-scale agricultural projects.
4. Guidelines for using knowledge of environmental effects to determine positive and negative factors in a given small-scale agricultural effort.

This background information can be used as the basis for planning environmentally sound projects in the areas of water supply and management, nutrient management, soil conservation, pest management and other factors.

This book contends that all planning framework/methodology, and development activities in general, must have a substantial basis of local participation in planning, decision making, and implementation. Planning is often described as a linear process of identifying needs, proceeding to

project objectives, and designing a project to meet those objectives. In reality the process is and should be complex. Effective planning of a project is a dynamic process involving the beneficiaries, the implementors, and any outsiders who are assisting. The initiator may be the community itself or it may be an outside development assistance agent or organization. In either case the partnership relations between the community and outside assistance must be balanced if the development activity is to belong to the community.

The methodology of planning for sustainable agriculture, the explanation of which begins on page 27, can be used to determine priority among a number of possible projects and to decide when a project design, perhaps because of a likely imbalance in benefits/costs terms, should be changed.

Two important methodological tools used in the diagnostic process are community and natural resource profiles. A community profile should be structured so that it will provide easy-to-use data on key social, economic, cultural and natural characteristics of the community or region. The profile does not have to be prepared in great detail, nor should it take weeks or months to complete.

The natural resource profile, which is described in much greater detail (pp. 29-33), is a survey of the natural environment (climate, soil, topography, rainfall, soil fertility, pests, etc.) that provides information necessary for assessing project feasibility and for determining potential benefits and costs as well as required modification. For small-scale projects, the inventory need not be turned into an intensive study, but rather a rapid rural appraisal method. There are at least two levels at which inventories should be done. The first consists of creating an overview picture of the area ecosystem. The second inventory is a localized biophysical and socio-economic review.

After the community has identified needs with the highest priority, the goals and objectives that address these needs can be formulated by the group. The objectives can be defined as the specific targets which will be achieved by the project. However, the main idea intended to be conveyed in this work is the need for flexibility at all levels when undertaking work with small-scale areas and projects.

CCAMA, F., 1991. *Desarrollo Rural: Posibilidades y Limitaciones en Puno* ("Rural Development: Possibilities and Limitations in Puno"), Lima, Peru, Proyecto de Investigación de Sistemas Agropecuarios Andinos (PISA), p. 126, IICA- E14 C386d.

This study describes a case from the rural areas in the department of Puno of the small farmers located in the southern region of the Peruvian Andes. This is one of the poorest areas of Peru, periodically beset by climatic threats of drought, frost, hailstorms and floods. Also, the land resource is limited because of high population density, especially in the surrounding lake areas.

The general objective of this study is to discuss concepts, tools and ways to implement rural development. As a case study, small farmers in the department of Puno are analyzed. The specific objectives are as follows: a) to examine the concepts, tools and experiences related to rural development; b) to describe the relationship of the global and sectoral policies in promoting rural development; c) to describe the system of production and to propose guidelines on policies that could lead to rural development in the rural communities of Puno.

The methodology (p. 3) in this study consists of: a) a bibliographic review on rural development; b) a case study of the rural communities; c) a discussion of the global and sectorial policies that promote rural development. Chapter 2 describes the steps to obtain information through surveys of small farmers in the rural communities. The statistical techniques employed in the study are also presented.

Data for the present study was gathered through a pilot survey of 263 families living in 20 rural communities. Table 1 (p. 5) contains information on participating communities and the number of heads of households studied. The approximate size of the sample represents 9% of the number of families that live in each community. The family is the unit of observation used.

The questionnaire was written in Castilian Spanish, but interviews were carried out in the native languages of the farmers. To determine the general socioeconomic characteristics, the system of production, technologies, and the pattern of consumption in the rural communities, small farmers were asked questions related to the following topics:

1. Number of family members.
2. The amount of food products consumed.
3. Total expenses in other materials.
4. Principal crops (in hectares).
5. Amount of the most important crops harvested, bought, sold, stored and used.
6. Human and non-human consumption of the most important products.
7. Formal secondary occupation of the head of the family.
8. Land use according to cultivated, in-fallow and non-cultivated areas.
9. Livestock per family according to species: cattle, horses, sheep, llamas, and alpacas.
10. The most important tools used by a farm family, indicating their uses.

It is difficult to converse and obtain information from the families in the farm communities without previous contact or motivation. In most communities, the Peruvian-Canadian Project included an extension unit for improving the production of barley and rape through improved seeds, fertilizer and technical assistance. During a good year, farmers had to return the seed and fertilizer to the Project. This working relationship between the rural community and international assistance facilitated the gathering of information for this study.

Chapters 4, "Aspectos generales de Puno" (General Aspects of Puno), and 5, "Actividad agropecuaria" (Agricultural Activity), contain information on a diagnostic of the agricultural situation in the microregion of Puno.

CENTRO CIENTIFICO TROPICAL, 1985. "Manual para la determinación de la capacidad de uso de las tierras de Costa Rica" ("A manual for determining land use capacity in Costa Rica"), San Jose, C.R., p. 75, GTZ- RC E11 022.

Below is an outline of this manual on determining the actual situation of the land use in Costa Rica:

1. **Characteristics and focus of the methodology:** this methodology is aimed at determining the land use capacity in Costa Rica. Its objective is to offer to the user (planner, extensionist and farmer) an instrument to serve as a basis for the land use planning in the area of agriculture and forestry, based on the principle of sustained yield.
2. **Components of the methodology of classification**
 - A. **Types of land use capacity**
 - a. Annual crops (Very high yield)
 - b. Annual crops (High yield)
 - c. Annual crops (Moderate yield)
 - d. Permanent and semi-permanent crops
 - e. Intensive pasturing
 - f. Extensive pasturing
 - g. Tree crops
 - h. Intensive forest production
 - i. Extensive forest production
 - j. Protection
 - B. Systems of technological management
 - C. Parameters for evaluation
 - D. Limiting factors
3. **Application of the methodology in the field:** this is a summary of all the requirements (personnel, equipment, etc.) needed to carry out a study using this method.
4. **Keys for each Life Zone:** in this methodology the L.R. Holdridge's World Life Zone Classification is used as a basis for establishing the first ecogeographic divisions.

5. Map of the dry months in Costa Rica.
6. Examples of crops in relation to the types of land use.
7. Soil conservation practices: some general guidelines on soil conservation practices that can be used as a reference are given for the application of this manual.
8. General scheme of specifications for determining the land use capacity.
9. Questionnaire recommended for gathering field data: this is a graph containing all the categories required in the field for carrying out the study.

CENTRO CIENTIFICO TROPICAL, 1992. "Metodología para la Evaluación Rápida del Medio Ambiente para el Desarrollo Rural" ("A Methodology for Rapid Evaluation of the Environment for Rural Development"), Costa Rica, p. 79, GTZ.

A Methodology on Rapid Evaluation of the Environment for Rural Development (MERMAD is the acronym in Spanish) is an instrument designed to analyze the possible environmental impacts of agroecological development projects in any part of the continent that can be used by lending institutions, local or national governments, or other interested parties. Whether the project is in the planning, design, or economic feasibility study stage or already in progress, the methodology can be utilized.

What is new about this system is that the user must simply go to the field and observe the physical conditions of the soil, know the specific life zone and discriminate all the conditions observed in the tables of land use elaborated for each region or life zone. This allows the user to determine not only what the correct use should be for the land, but, also, the impacts on the land, since the divergence from optimal use towards over-utilization as well as under-utilization can be assessed.

This method of rapid evaluation can be used equally well for field work in unknown areas, as for areas that have already been studied, through a classification based mainly on office work, using maps and diverse original materials on bioclimate, soils, geomorphology and lithology. The procedure is somewhat flexible according to the circumstances of each separate case, especially considering the total area, the degree of detail required (scale of the map) and the actual state of rural development.

Nevertheless, this study leaves the door open for a more detailed analysis of environmental impacts. It does not include, for example, the considerations and analysis of the possible economic losses due to over- or under-utilized land. Also, soil loss, due to erosion in each plot under study, and other aspects that require a more extensive study has not been calculated. The methodology can be developed in more detail in relation to the quality of the most propitious specific crops, the calculation of a possible "index of permanent profitability," both directly linked to the concept of sustainability.

The most useful sections of this report in this case appear in Chapter II (pp. 9-16) which begins with a table on the process of the MERMAD system. The environmental evaluation of rural development methodologies that have been developed by the Tropical Scientific Center start with the ecological composition of the environment and land and classify and discriminate the uses on the basis of sustainable use of the land base. Table 1 (p. 13), which shows the fundamental conditions for agricultural development, describes the physical conditions at the beginning of the left-hand column. Evidently, this is presented in that manner because the universal laws of physics are those which establish the rules of the game related to the phenomenon of energy dissipation of the environmental elements on the earth's surface. This is based on the consideration that there are immutable conditions established by a "climatic determinism", which must be obeyed. In the right-hand column, on the other hand, there are intervening laws imposed by man, which continually change with historical events. Nevertheless, the analysis of interacting phenomenon must begin with the physical components. The CCT methodology considers that it is convenient to start from the natural conditions systematically expressed through the life zone model. From that basis, speaking of sustainability, the model must be based on ecological feasibility, considering the unchanging laws of nature.

They have concluded that the determination of the viability of development projects on an ecological basis is urgent in order to be productive not only in the short-term but also in the long-run.

DOUROJEANNI, A.; M. RENARD, 1987. "Guía para orientar estudios con fines de gestión para el desarrollo de zonas alto Andinas" ("A guide for studies aimed at the development of the Andean highlands"), Lima, Peru, CEPAL, 90 p., GTZ- RC P10 0009.

"The document provides concepts and procedures for orienting the execution of studies in mountainous zones with the purpose of selecting, sustaining and formulating plans, programs and projects for improving the standard of living of the population, as well as conserving the natural resources that sustain them.

In the first part, a series of terms and concepts are defined which, although used frequently, are often used with different meanings. The following designations used are equally differentiated: available advantages, harvest, management, planning, administration and development of watersheds. They briefly evaluate the experiences required for accomplishing the studies and finally propose a work methodology that is action-oriented."

Although there is a section entitled, "Methods for an analysis of watersheds and microregions", the explanation of the work method is described in the previous section titled, "Sequential planning of the analysis process." The first section mentioned is a reading on the problems related to the availability of information on this subject and a list of the organizations which should coordinate the diffusion and distribution of this information.

In the explanation of the proposed methodology for the analysis of zones, watersheds and microregions, are the following six steps:

- a) Determine the problems, their causes and effects on the area, and in the framework of the future scenarios, such as they are perceived by the population, users and technicians.
- b) Transform the problems determined into objectives.
- c) Delimit and classify the areas within which the objectives are to be accomplished.

- d) Determine the restrictions that must be overcome in order to reach the objectives within the previously delimited areas.
- e) Propose solutions for overcoming previous restrictions with the purpose of reaching the proposed objectives within the delimited areas.
- f) The next step, once the solutions are planned, prioritized and ranked, is to determine what is (or are) the alternative(s) which will be selected for execution and in which order, as well as planning the strategies for their implementation." (pp. 12-17)

The second part analyzes and compares 15 case studies of the watersheds and **microregions**, on the basis of which a series of recommendations and conclusions are determined. A tentative classification of the factors considered in the analysis for each case study is presented, as well as observations for each study.

The annex (p. 40) includes an exhaustive list of topics considered in an integral **diagnostic** of watersheds and micro-regions (translation of the document, "Framework for a Regional Plan in Developing Countries" of ILRI, 1983)."

The definition of a **diagnostic** is: "an identification, interpretation and explanation of the causes giving rise to the deviation between the pattern of reference and the existing situation, in addition to projecting on a time horizon previously defined, the tendencies of that reality. The **diagnostic** is the previous step needed to propose solutions." (p. 4)

FAO, 1990. "Guía para Diagnósticos Florestais Microrregionais", Rome, p. 71, GTZ.

This report begins with an explanation of the reasons for a guide for **diagnostics** of forested **microregions**: it incorporates experiences to present an operational **methodology** used to determine optimum utilization and sustainability of particular **microregions**. The necessity of such a methodological guide has been proven in a variety of applications in the analysis of forestry. The guide is not intended to be a rigid operational manual that limits the abilities of the professionals involved in creating the **diagnostic**. The idea is to present a tool which communicates previous experiences and to put together criteria that has been proven effective in the past.

The structure of a **diagnostic** of a forested **microregion**, given on page 8, contains three main parts: first, the basic information including the percentage of the area covered by forest, erosion problems, and local industries which may affect the forest resources: secondly, the interpretation for example: Are the forest resources concentrated in areas controlled by outside industry? Or, do the local industries require a certain type of wood?; finally, the **diagnostic** must include the proposals recommended by the study (ex., establish more formal connections between producers and consumers; investigate the validity of agroforestry solutions).

The other main area of this guide which may be of interest starts on page 27. It is an explanation of the **pre-diagnostic** phase, which is basically a description of the methodology used in the process of constructing the **diagnostic**. The majority of this section is devoted to the gathering of pertinent data relating to the proper maps needed, climate, population, etc.. A detailed list of the basic activities of a **prediagnostic** is given on page 30. These include preparation and elaboration of cartographic information, elaboration of data banks, general fieldwork, definition and mapping of homogeneous agroeconomic zones, elaboration of the preliminary typology of production systems, characterization of the financial distribution of forest resources, and compilation of information concerning regional consumption of forest resources.

The remainder of the guide gives information on the proper integration of agriculture and other small industries into the **microregion**.

FAO, 1984. Land evaluation for forestry, Rome, 123 p., GTZ- #117.

In the context of this report, there doesn't seem to be a tremendous difference between the term "evaluation" and a **diagnostic**. The entire report is an explanation of different methodologies and criteria for determining the suitability of a certain area to different types of forestry and agroforestry, including all the factors which would be used in a **diagnostic**.

Chapters 1 and 2 are used as a basic description of the purposes, principles and concepts of land evaluation. Chapter 3 is an explanation of procedures and methods used to determine suitability, including computerized methods. The following is a summary of the steps given on page 25, which pertain to the methodology of the evaluations:

- "1. Jointly with the governmental or other agency commissioning the evaluation, determine the objectives, constraints, data and assumptions
2. Plan the necessary surveys and specialized studies; draw up the work program
3.
 - (a) Identify and select the land utilization types to be considered in the evaluation
 - (b) Decide which parts of the area, if any, are not relevant for certain land utilization types
4. For each land utilization type, complete a provisional description based on the headings listed
5. For each land utilization type, select the land use requirements and limitations that are likely to be relevant to assessing its suitability within the area
6. Decide on the land units to be used for the evaluation. Where necessary, carry out surveys and produce a map of land units
7. Decide which techniques for estimation or prediction of forest resources or yield are to be used. Conduct the necessary studies

8. (a) Identify the land qualities to be used which correspond to the selected land use requirements and limitations
(b) Decide which land characteristics (diagnostic factors) are to be used to measure or estimate those land qualities
9. For each land unit, survey or determine the value of land characteristics selected in Step 8(b). Draw up tables listing the characteristics of each land unit
10. Decide on the data needed for economic and social analysis of land use alternatives. Conduct necessary surveys to collect such data
11. Assess the factor ratings for each land utilization type.
12. (a) By comparing the factor ratings with land characteristics of the land units, obtain land suitability ratings. Summarize these as tables, one for each land utilization type on each relevant land unit (each land use system)
(b) Combine the suitability ratings to obtain provisional land suitability classes for each land use system"

Chapter 4 titled, "Planning the evaluation", is an expanded explanation of the methodological framework set up in Chapter 3 (objectives, constraints and assumptions, context of the study area, and specifications of work).

Examples of pertinent sections within Chapter 7, "Surveys and specialized studies of land", include: Objectives, information and survey requirements (p. 56); surveys of individual factors of the physical environment (p. 60); estimation of forest volume growth and yield (p. 61); and methods for yield prediction in land evaluation (p. 64).

Chapter 8 deals with matching land use with land outlines—a method for land suitability classification. Chapter 9 discusses the related subject of environmental impact analysis.

Finally, Chapter 10 goes into some detail on the role of economic and social analysis in land evaluation including: calculation of land suitability in economic terms (p. 96); social aspects of forest land use (p. 101); methods of social data collection (p. 102); and assessment of social consequences of land use alternatives.

FRANÇA, W.M., 1991. "La capacitación y la concientización críticas, instrumentos básicos para la planificación hacia el eco-desarrollo: Un ejercicio en la microcuenca ubicada en la provincia de Santa Lucía, Departamento de Boaco, Región V, Nicaragua" ("Training and social awareness, basic instruments for planning aimed at ecodevelopment: An exercise in the micro-watershed located in the province of Santa Lucía, Department of Boaco, Region V, Nicaragua"), Turrialba, C.R., CATIE, 109 p., CATIE- Thesis F814.

This work discusses a methodology of training and conscience raising that guarantees the basis for planning in integrated watershed management through a theoretic discussion strengthened with a practical example.

Contrasting the methodology of conventional planning and the proposed methodology in this work, makes it possible to identify neutralizing factors from the former and, consequently, basic contributions for conceptualizing the latter.

The methods used for this work are divided into three parts:

First step:

- a) Maturation and acceptance of the topic of study as a product of disciplinary academic support and the orientation of advising professors.
- b) Selection of a location for carrying out the project.
- c) Identification of problems and objectives.
- d) Literature review.
- e) Write-up of the project proposal.
- f) Presentation of the thesis seminar.

Second step:

- a) Identification and institutional support
- b) Reconnaissance of the study area and gathering of cartographic and bibliographic information.

Third step: Field work:

- a) Transferring and establishing the work team in the region.
- b) Selecting a meeting place
- c) Presentation meeting
- d) Seminars on training and consciousness raising
- e) Work meetings

Some of the tables used in this study for illustrating the work methodology and the current situation in the region are as follows:

- 1. Climatic stations of the upper and central watersheds of the Malacatoya River (p. 36)
- 4. Maximum, medium and minimum monthly temperatures from the Boaco station (p.44)
- 8. Elevation above sea level vs. temperature vs. potential evaporation (p. 54)
- 10. Longitude, volume and area of the root system of a beet (p. 77)

Some of the figures included are:

- 1. Simplified scheme of the conventional methodology (p. 16)
- 2. Simplified scheme of the proposed methodology (p. 16)
- 3. A vision of proposed and conventional methodology under the perspective of the theory of systems (p. 18)
- 16. Potential use of the land in the El Riego microwatershed (p. 64)

ICRAF, 1983. "Guidelines for agroforestry diagnosis and design", Nairobi, Kenya, 25 p., GTZ- RC F08 0020.

This paper is the original draft version introducing the concept of **Diagnosis and Design**. "The aim of ICRAF's D & D methodology is to assist in the design of appropriate agroforestry systems, as a conceptual basis for the identification of research needs and the formulation of agroforestry research and development projects. The methodology is directed toward meeting the needs, solving the problems, or realizing the potentials of specific land use systems. In its fully developed form D & D is an iterative process which is repeated throughout the project cycle for different reasons at different stages. However, in the initial "pre-project" or "project formulation" stage the D & D process is used to arrive at prototype designs to initiate the R & D project and set it moving along generally appropriate lines." (p. 1)

The pertinent section of the paper may be the list of specific procedures (p.10) involved in the **prediagnostic and diagnostic** stages of project development. The procedures for project formulation consist of a series of information gathering and analytical steps, leading logically from one to the next. This sequence entails a hierarchical progression from the general to the particular, which is designed to economize on time and effort by excluding irrelevant information from further consideration while developing a progressively sharper focus on essential information. By this open-ended but structured approach the **D & D methodology** avoids the seemingly endless and needlessly complicated data collection and processing task characteristic of an unstructured approach to systems analysis.

Following are the steps involved in the **prediagnostic and diagnostic** stages:

Prediagnostic Stage: 1) Background description of the study area, including **diagnostically** relevant aspects of the biophysical and socioeconomic environment, 2) differentiation and selection of land use systems within the study area for further D & D attention, and 3) preliminary description of **diagnostically** relevant aspects of the selected systems.

"The prediagnostic stage establishes the basis for the steps which follow, by giving basic physical and socioeconomic information and identifying and describing the land use systems to be considered." (p. 16)

Diagnostic Stage: 4) diagnostic survey of the selected systems and relevant aspects of the environmental setting, 5) diagnostic analysis and identification of major land use problems and potentials, and 6) derivation of specifications for appropriate technology (including non-agroforestry options but with special attention to agroforestry potentials).

"Adoptability is given particular attention during diagnosis. The technological level, attitudes, capital resources and labor availability of the farmers are examined, together with the institutional and social framework within which they operate. Economic conditions, notably markets and levels of income expectancy, are also critical. This stage of the study leads to identification of the constraints to adoption of improved technologies." (p. 18)

IICA, 1990. "Guía para la elaboración de diagnósticos y perfiles sectoriales agrícolos" ("A guide for elaborating diagnostics and agricultural sector profiles"), San Jose, C.R., p. 17, IICA- IICA PM-A1/SV-90 08.

The objective of this document is to facilitate the preparation of diagnostics and sectorial profiles by the IICA offices in the member countries. Those diagnostics and profiles will be an important source of support to the countries in negotiating with international financial organizations, and at the same time serve as a fundamental antecedent in developing the Strategy for Action of the IICA in the country and subregion. The guide is divided into three sections: the first section is an introduction on the definitions and characteristics of the diagnostics, profiles and sectorial programs; the second section describes the methodology for elaborating sectorial diagnostics; and the third section describes operative procedures for elaborating the diagnostics and sectorial profiles.

The majority of the book is devoted to explaining the methodology of those diagnostics. The basic criteria for elaborating the sectorial diagnostic must be the association between policies, institutions and investments, with agriculture as the main focus. This analysis should generate conclusions and recommendations that are aimed at carrying out specific actions. An ideal diagnostic must present a causal relationship between the functioning of policies, public institutions and agricultural investments with the current behavior of the farm sector. This should permit the clear identification of policy designs, institutional reforms and the necessary investments for growth of the sector. But it is very difficult to separate the effects of each of those variables on the performance of the agricultural sector, mainly because those effects are ignored and are of different duration, making the evaluation difficult. Also, this ideal diagnostic becomes even more difficult to elaborate due to the lack of data which characterizes the entire Latin American and the Caribbean regions.

Thus, the purpose of the diagnostic is to make an approximation based on an analysis of the relations previously indicated and a careful interpretation of the results that provide guidelines on how policies, institutions and the process of agricultural investment can be changed to modify their effects on agriculture. Therefore, the diagnostic must be

essentially interpretive and focused on the last ten years. Converting it into a descriptive work or an exhaustive historical analysis of the agricultural sector must be avoided. In addition, given the financial restrictions and the need for carrying them out in relatively short periods, the diagnostics must be based on the existing data and avoid the use of sophisticated analytical models.

A Sectorial Diagnostic (SD) is a basic study which allows for greater knowledge of the behavior of the agricultural sector in the member countries of the IICA. It is oriented towards providing basic information and identifying lines of action in preparing sectorial profiles and designing action strategies for the IICA at the national level. The main focus of the diagnostic must be the relationship between policies, institutions and investments and the behavior of the agricultural sector. This analysis must generate conclusions and recommendations that are aimed at carrying out specific actions associated with the action strategy of the IICA at the national level and for elaborating profiles, sectorial programs and investment projects.

IICA, 1987. "Manual para la preparación del marco orientador del desarrollo rural en el nivel microrregional" ("A manual for preparing the orientational framework for rural development at the micro-regional level"), San Jose, C.R., 40 p., IICA-IICA PM-413.

This document presents a method for designing a methodology of analysis and administration of the institutional infrastructure of a microregion. The work is a practical guide for facilitating the work of organization and synthesis of the decisions of orientation, adopting them at the **micro-regional** level through a procedure which allows for the defining of **micro-regional** oriented frameworks. It considers, on the one hand, the central elements, essential definitions and the spirit of a national orienting framework and, on the other, the particular characteristics of individuality of each microregion.

The document is divided into two parts. The first part summarizes the conceptual aspects related to conducting the planning process, defines the contents and the function of the orienting framework, and presents the process of political analysis as a foundation for its preparation.

The second part, divided into phases, defines the activities and inputs for preparing the orienting framework and establishes the elements provided by the doctrine of the framework and the **diagnostic**. It then presents the procedure for specifying the objectives, designing strategy and defining areas of action, and finally, the activities of the synthesis of the exercise through the generation of the "product" or document which contains the **micro-regional** orienting framework.

An objective is no more than an explicit decision for obtaining determined results in a defined period, taking into account the available resources, as well as the conditions and factors which limit or facilitate obtaining them. For that reason, in order to define objectives, it is necessary to rely on an adequate characterization and interpretation of the problems and their causal relationships as well as the identification of alternative solutions, whose feasibility will depend on the available resources and existing potentials and restrictions.

The strategy is integrated essentially through: i) the definition of the activity areas; ii) the establishment of priorities and; iii) the determination

of the path of activities. Through those elements, the general pathway is defined which will guide the actions of public organizations, as well as of socioeconomic agents, to make it possible to reach the established goals and objectives with the resources provided in a given period of time. The strategy demonstrates how to confront action and provides a tool for mobilizing resources to achieve objectives.

The definition of a territorial area of the program is provided through the selection of a group of delimiting criteria that consider the ecological, productive and cultural conditions, taking into account the political-administrative division of each country and the geographical areas with a greater number of potential beneficiaries of the program.

Special care was taken to include practical examples in facilitating the use of this document. It is worth mentioning that the present methodology should be used as a guiding document and not as a set of rigid rules and guidelines since it is necessary to make the corresponding adaptations for satisfying the particular requirements and needs of each country and microregion.

IICA, 1985. "Selección de documentos para la formulación de proyectos" ("Selection of documents for formulating projects"), San Jose, C.R., 208 p., IICA- IICA PRRET-311.

This report contains articles that show and analyze the methodologies used for identifying investment projects and mainly considers the various stages that must be taken into account, except sustainability, in formulating agricultural projects.

It includes an article on the "Elements of the Diagnostic", which considers the importance of having a good diagnostic available prior to elaborating a project. Below is an outline of this chapter (pp. 97-121) which begins with a comprehensive definition of a diagnostic (again, it does not include sustainability):

A. Current situation and conditions that affect production

1. Current situation of production
2. Conditions that affect production
 - a. Physical conditions that affect production
 - b. Biological conditions that affect production
 - c. Economic conditions that affect production
 - d. Social conditions that affect production
 - e. Institutional conditions that affect production

B. Current situation and conditions that affect commercialization

1. Current situation of commercialization
2. Conditions that affect commercialization
 - a. Structural conditions of production that affect commercialization
 - b. Investments and their effect on commercialization
 - c. Structural conditions of the markets that affect commercialization
 - d. Institutional conditions that affect commercialization

C. Current situation and conditions that affect the distribution of the product and/or income

- 1. Current situation of the distribution of the product and/or income**
- 2. Factors that determine the distribution of products and/or income**
 - a. Current distribution of fundamental productive resources**
 - b. Access to additional productive resources**
 - c. Market structure of work**
 - d. Institutional factors**

D. Conclusions

JORDÁN, F., 1989. *Capacitación y Participación Campesina: Instrumentos Metodológico y Medios (Farmer Training and Participation: Methodological Tools and Means)*, San Jose, Costa Rica, IICA, 44 p., IICA- IICA LME-90.

The section of this text, "On the production-educational-organizational relationship" (37 p.), explains the content of a diagnostic of the actual situation in a microregion.

The diagnostic and the identification of the actual needs of the farmer or indigenous community, within the participatory system, are a suitable way for their members to become aware of their position in society and the need to assume a major role in the national development process. This diagnostic should be continuous and be structured for the purpose of designing and reaccomodation of future strategies which contemplate the survival and economic, organizational and cultural consolidation of the community in a social, political and economic context which is generally disadvantageous.

The participatory diagnostic must prioritize, as an end product, the identification of problems and causes related to production; the extraction of surpluses; negotiation with the outside world; and rural reproduction (income, health, nutrition, basic services).

The diagnostic is a constituent part of the training process and not a previous step. In this process, the trainer must participate through dialogue and a horizontal relationship with farmers. Similarly, he must offer them the possibilities of assuming scientific and technical knowledge that they have been able to construct and systemize in training courses and acquired as a consequence of their differentiated social situations.

KOTSCHI, J., 1990. *Ecofarming Practices for tropical small holdings*, Weikersheim, Germany, Verlag Josef Margraf, 185 p., GTZ- #581.

In this reader, initial results are presented of research into newly developed ecofarming practices, mainly involving agroforestry. The results are derived from small-scale experimental programs which form part of rural development projects. The close connection with agricultural extension and the experimentation on farmers' fields and in cooperation with farmers make this type of research highly applicable to local farming systems.

The content of the book includes five studies done in separate microregions of the world. Most of these regions are mountainous, which defers to the book's emphasis on soil fertility and erosion. The findings of these studies, presented in Chapters III-VII, are introduced by a description of the research location, followed by a brief analysis of the major problems. Based on this, the main aims of the research and methods applied are outlined. The discussion of results is limited to the main findings, which already indicate the perspectives for future research.

The book intends to make a useful contribution to the discussion of ecofarming in general and will provide some ideas as to how ecological principles can be translated into techniques that are applicable within smallholder farming systems. To this end, the methodological approaches are particularly important, though they are not focused on the diagnosis of the problem, but more on the resolution of the discovered problem. However, this work is important because it follows each study from the initial description of the location (which constitutes a short diagnostic of the microregion), to the discovery of the problems, to the conceptualizing of the methodology and the implementation of that methodology, to the analysis of the initial results.

LAGUNA Q., J.L., 1990. "Seminario-Taller sobre metodologías para la implementación de diagnósticos rurales" ("Seminar: Workshop on methodologies for implementing rural diagnostics"), Bolivia, SUCRE, 121 p., GTZ- RC F08 0001.

This document is a very informal summary of a seminar carried out by the Agroforestry Plan of Chuquisaca (PLAFOR) in Huayllas, Bolivia. To be able to resolve the problems of development planning/action stated in the antecedents of this compilation, it was decided that a workshop-seminar be developed, not only for introducing the methodologies designed, but also fundamentally to coordinate criteria arising from experience and the formation of the staff involved with rural development.

The desire to create a more integrated idea of the relationship in which the technicians and the community found themselves, brought about the need to structure a seminar to allow for the integration of the team and a broad discussion based on the tools utilized for research and action.

For this reason, the criteria presented in the debate were broad, taking into account the experiences of the field staff, from more technical and conventional positions to the most integral criteria proposed by a more innovating sector.

The first part of the seminar was conducted by introducing the conceptual elements which underline the structure of a complete process of research, allowing for topical research, structural research, participatory research, and finally, systems of monitoring and evaluation. It took into account that this process is carried out directly with the community in all stages of the process; in the gathering and systematizing information and the resulting dissemination of information.

The tools used in the rural diagnostic are the following:

1. Techniques and exercises of classification: It deals with an exercise in which the options and criteria of the group studied must be selected in order to compare and evaluate them later with those consulted.

2. **Brainstorming of expectations of the teams concerning the method:** This phase was carried out first in small groups and later a discussion was initiated with the entire group.
3. **Role playing and semistructured interviews:** This is the most important tool in the research process for this methodology, since with this, the elaboration and systematization of the data in the form of tables, graphs, diagrams and profiles, etc. is initiated.
4. **Review of data:** Using various sources of documents from external institutions and reviewing them in groups.
5. **Use of interviews (prepared material):** Tapings made in Huayllas were used as a source of information in order to form groups of two, to produce graphic representations of the persons and organizations as well as the profiles of their life histories.
6. **Elaboration of the sketches and profiles:** The sketches are as realistic as possible, in which the community is represented with all its relevant components. The profiles are cross sections, to do inventories and to describe the variable components of the communities such as soils, crops, etc.
7. **Designing graphs of the agricultural cycle:** The agricultural cycles are representations of all the measurable information under temporary parameters carried out in the agroecological system of the community.
8. **Simulation of reporting information:** A simulation of a farm meeting was carried out, led by a union representative, where all the members and the team of extensionists had to present the information.
9. **Elaboration of objectives and hypothesis to investigate through field work:** This was a review of the brainstorming session in a selection of what is possible to research, and to determine the objectives of the diagnostic.

Also, each step contains a description of the reactions of the group and how it functioned in this case.

LOPEZ B., W., 1991. "La investigación adaptativa en campos de agricultores (ICA) en la región de La Fraylesca, Chiapas, México: Un análisis de rentabilidad económica en el contexto del manejo integrado de los recursos naturales" ("Adaptive research in agricultural fields (ICA) of La Fraylesca, Chiapas, Mexico: An analysis of economic profitability in integrated management of natural resources"), Turrialba, C.R., CATIE, 115 p., CATIE- Thesis L864in.

The International Center for Corn and Wheat Improvement (CIMMYT) has developed a methodology of adaptive research, called "Research in Agricultural Fields" (ICA is the Spanish acronym), which summarizes groups of ideas and methodological procedures for the purpose of increasing the efficiency of national research organizations in their function of generating and transferring technological innovations relative to appropriate management of natural resources.

In Mexico, INIFAP and CIMMYT have developed collaborating projects of adaptive research. Nevertheless, the potential efficiency of this methodology still needs to be measured with ex-post evaluations.

This work was assessed through economic indicators, the efficiency of resources invested in the project of adaptive research executed in "La Fraylesca", Chiapas. The analysis incorporated direct impacts of the liming of acidic soils and the use of urea, compared with the investment in generating and transferring these technologies.

The section on methodology and materials describes some unique aspects compared with the other diagnostics in the microregions. The principal aspects are:

1. Point of view of the evaluation: there are two alternatives:
 - a) Evaluate the project from the national point of view; b) carry out a study from the international point of view.
2. Identify and characterize the products to be evaluated. As a result of the IICA project in La Fraylesca, two types of products are identified:
 - a) an addition to the national knowledge base through the increase in training and experiences in the National Institute of Forestry and

Agricultural Research (Mexico); and b) an increase in productivity and income for farmers through the generation and adoption of technologies.

3. Estimate the annual flow for costs of research. According to the point of view taken, all the inputs used in generating and diffusing technologies during project implementation were included, independent of source of those resources.
4. Estimate the annual flow of benefits. This step includes specification of the demand and supply curves of corn production and an explanation of the project impacts.
5. Evaluate the technologies in the farmers' fields and their degree of diffusion. A statistical analysis was executed after separating the farmers into three groups based on the different degree of access to various resources.
6. Estimate the annual pattern of adoption. For estimating the area on which the liming would be adopted through the years, three alternatives of adoption have been assumed. They were formulated and discussed with the regional authorities of the principal institutions related to the operative development of the liming program.
7. Update measures of the value of the project. Three measures were used in the study to analyze the adjustments of the financial accounts that are considered to change the perspectives of a decision to invest in the project (net present value, internal rate of return, and benefit-cost relationship).

MACDICKEN, K.G.; N.T. VERGARA, 1990. *Agroforestry: Classification & Management*, New York, John Wiley & Sons, 382 p., GTZ- #57.

This book includes at least one pertinent chapter titled, "Theory and Practice of Agroforestry Diagnosis and Design" (p. 58), by John B. Raintree, which reviews some of the points of ICRAF's system of Diagnosis and Design. The chapter states that a well-designed agroforestry system should satisfy three basic criteria: productivity, sustainability and adoptability. The first two criteria are virtually axiomatic in agroforestry, where conservation objectives are on nearly equal footing with production objectives. However, traditional farmers are less concerned about conservation of resources than about production of outputs. Hence, the concept of sustainability is invoked as a way of operationalizing the conservation objectives in terms of production objectives. The emphasis on adoptability arises from the observation that no technology will have an appreciable impact on rural development unless it is adopted by a significant percentage of the intended users.

An outline of this chapter follows:

1) Criteria of good agroforestry design

- 1.1) Productivity
- 1.2) Sustainability
- 1.3) Adoptability

2) A diagnostic approach to agroforestry design

This section discusses ICRAF's Diagnosis & Design methodology, stating that the refinement of the D & D methodology is a continuing process that ICRAF is pursuing through collaboration with researchers and rural development workers in many parts of the world. In the initial phase of the methodology development effort, the emphasis was on procedural aspects; that is, on arriving at a robust and widely applicable set of procedures for diagnosis of land management problems and design of appropriate agroforestry systems for any given location. As a safeguard against the intrusion of "pet technology" biases into the design process, the emphasis was on an open-ended approach to the design of

problem-solving interventions in existing land use systems. As of now it has become apparent that the compilation and analysis of the highest possible number of case studies is the only way to transfer the body of knowledge concerning Diagnosis & Design of agroforestry systems from a hypothetical emphasis to a more practical and proven knowledge base.

- 3) Information requirements for agroforestry design
- 4) Procedures for agroforestry diagnosis and design: an open ended approach.

In the final analysis, no methodology can be a substitute for design creativity. D & D procedures are intended (1) to prepare the mind to come forth with a relevant response to the design problem by presenting the design imagination with a coherent diagnostic stimulus and (2) to provide a framework for carrying the diagnostic information forward into detailed designs.

- 4.1) Basic procedures
 - 4.2) Suggested procedures for large-scale research and development programs
- 5) Substantive aspects of agroforestry diagnosis and design: The emerging knowledge base for agroforestry
 - 5.1) Population pressure and agricultural evolution
 - 5.2) Potential sources of increased production
 - 5.3) No technology before its time
 - 6) Recommendation domains for agroforestry practices in tropical land use systems
 - 6.1) Spotlight on tree crop alternatives
 - 7) Diagnosis and design: Past, present and future

A variety of tables are provided throughout the text to illustrate the procedures and their suggested order and relationships.

MAYER, E., 1981. "Uso de la Tierra en los Andes: Ecología y Agricultura en el Valle del Mantaro del Perú con Referencia Especial a la Papa" ("Land use in the Andes: Ecology and Agriculture in the Mantaro Valley in Peru with Special Reference to the Potato"), Lima, Peru, Centro Internacional de la Papa (CIP), 115 p., IICA-333.760985 M468E.

In 1954, a group of economists and agronomists studied the Mantaro Valley to make recommendations to the Peruvian government on general guidelines that would help contribute to regional development. Their first recommendation was to prepare maps on ecology and agricultural land use. For 25 years, aerial photographs were taken, and maps on topography, geology and soils were produced for the Mantaro Valley.

This report summarizes and interprets information on agricultural land use. Maps have been prepared, indicating the principal areas of land use where potatoes are cultivated, their ecological characteristics and land tenure patterns. The text explains the methodologies used for defining the areas of land use as well as the interpretation and the possible uses of prepared maps.

The map on agricultural land use (detailed description on p. 10-11) has the following characteristics:

1. Agroecological areas: Instead of demonstrating the existing crops in each field, as they appear in the maps on land use prepared for the coastal valleys, this map summarizes the crop patterns in the agroecological areas and sub-areas. The term, agroecological zone, is defined as an association of agricultural and livestock activities in which the vegetation, animal life, land physiology, geological formation, soil and climatic conditions are all interrelated in a unique and identifiable combination that has a physiognomy or clearly different aspect. In the Mantaro Valley, the climatic conditions change abruptly in the lower areas as a function of the changes in altitude, and those climatic changes tend to have a strong influence on the agricultural activity. The three principal agroecological zones in the valley are defined by altitude: Upper (3950 m), Intermediate (3550-3950 m), and Lower Agroecological Zone (3000-3550).

2. **Sub-Zones:** There are three principal parameters for the internal differentiation in the agroecological zones: irrigation, the type of use and the dominant crop. In the legend of the map, sub-zones are identified in terms of the type of agricultural enterprises conducted, whether the agriculture is with or without irrigation, and the dominant crop. The following symbols were used:

Type of enterprises: P= Farm
 C= Business
Conditions of the land: D= rainfed
 I= irrigated
Dominate crop: M= Maize predominates
 T= Tubers predominate
 G= Grains predominate

3. **Identification of locations-** Map on land use identifies all the principal and secondary highways as well as the capitals of districts and other important rural population centers.
4. **Bilingual Reading:** To facilitate the use of maps for English and Spanish speakers, all the maps and diagrams are bilingual.
5. **Outlines on the distribution of crops:** The distribution of the principal crops (potatoes, barley, wheat, maize) and horticultural crops is shown in a series of outline maps based on the 1972 Agricultural Census. In order to understand this report, it is recommended that the 12 maps, which correspond to the text, be consulted as the text is read.

MCCRACKEN, J.A., J.N. PRETTY, G.R. CONWAY. An Introduction to Rapid Rural Appraisal for Agricultural Development, London, IIED, 96 p., GTZ.

Rapid Rural Appraisal (RRA) in the context of agricultural development is any methodology which makes use of a multidisciplinary team, working with farmers and community leaders to develop in a quick, yet systematic fashion, a series of hypotheses for such purposes as: (1) assessing the agricultural and other development needs of a community; (2) identifying priorities for further research into those development needs; (3) assessing the feasibility of planned interventions and innovations; (4) identifying priorities for development actions; or (5) implementing and/or monitoring development actions.

Five key features of good RRAs are:

- Iterative: the process and goals of the study are not immutably fixed beforehand, but modified as the team realizes what is or is not relevant. This involves "learning-as-you-go", whereby newly generated information helps to set the agenda for the later stages of the analysis. Innovative: there is no simple, standardized methodology. Techniques are developed for particular situations depending on the skills and knowledge available.
- Interactive: all team members and disciplines combine together in a way that fosters serendipity and interdisciplinary insights. A systems perspective helps to make communication easy.
- Informal: in contrast to the formality of other approaches, the emphasis is on partly structured and informal interviews and discussions.

In the community: learning takes place largely in the field, or immediately after, in short duration workshops. In particular, farmers' perspectives are used to help define differences in field conditions.

The "core" techniques used in almost all RRAs are the following:

- 1) Secondary data review: secondary information and data or unpublished data, acquired by other people at an earlier time, that are

relevant to the topic or agrosystem which is the target of the RRA, are published.

- 2) **Direct observation:** This is relatively straightforward and encompasses any direct observation of field objects, events, processes, relationships or people that is recorded by the team in note or diagrammatic form.
- 3) **Semi-structured interviews:** probably the most powerful RRA technique. It takes place in informal, guided interview sessions where only some of the questions are predetermined and new questions arise during the interview, in response to answers from those interviewed.
- 4) **Analytical games:** these include such techniques as ranking which questions are used in interview sessions as a quick means of finding out an individual's or a group's list of priorities or preferences.
- 5) **Stories and portraits:** these are short, colorful descriptions of situations encountered by the team in the field or stories recounted by people met there.
- 6) **Diagrams:** these can be defined as simple, schematic devices which present information in a readily understandable visual form.
- 7) **Workshops:** the workshop is a means of bringing people together, including the field team and outsiders introduced for their skills and experience, to participate actively in reviewing, analyzing and evaluating the information gathered.

Four classes of RRA are introduced in the text:

1. **Exploratory RRAs** (pp. 51-58) for obtaining initial information about a new topic or agroecosystem. The output is usually a set of preliminary key questions and hypotheses.
2. **Topical RRAs** (pp. 58-65) are used to answer a specific question. The question may have been asked by a previous Exploratory RRA or may come from local research/extension workers.
3. **Participatory RRAs** (pp. 65-71) help involve farming households in all stages of development work, from the identification of needs to the assessment of completed projects.

4. **Monitoring RRAs (pp. 71-73) evaluate the success and impact of development activities, whether these are products of an RRA or a more conventional planning process.**

The philosophy of the concept of the RRA is detailed on pages 12 and 13.

MEHL, C.B., 1990. *Farm- and Village-Forestry Practices: Methods for a regional study*, Bangkok, Thailand, Winrock International, 131 p., GTZ- #364.

This handbook is intended for those wanting to conduct their own research using the farm- and village-forestry database as a research tool. They can collect and, more important, enter data using methods similar to those of others who have already used the database. They can compare their data with existing entries to build on the comparative research. The handbook not only guides the researcher through the database, but, also, offers guidance on field methods of data collection. This guidance is aimed at collecting the data in such a manner as to make the data entry process as simple and systematic as possible by coordinating it with the requirements of the computer database. Also, ideas for sources of information and practical advice for the carrying out of data collection are also included.

The guidelines for data collection and entry fall into the following categories:

1) National level data

- a. Background information
- b. Government forestry development intervention

2) District level data

- a. Background information
- b. Agro-ecological information

3) Village level data

- a. Background information
- b. Agro-ecological information
- c. Government forestry development intervention
- d. Land use, tenure, and property issues

4) Household level data

- a. Background information**
- b. Government forestry development intervention**
- c. Land use, tenure, and property issues**
- d. Forest use practices**

The remainder of the guide is devoted to everything necessary to use the computerized database.

MOLINAS M., A.S., 1991. "Metodología simple y apropiada para establecer capacidad y uso sostenible de la tierra, aplicable a nivel de pequeña finca para la región II de Nicaragua" ("Simple and suitable methodology for establishing the capacity and sustainable land use applicable on small farms for region II in Nicaragua"), Turrialba, C.R., CATIE, 175 p., CATIE- Thesis M722m.

The objective of this work is to propose a **methodology** that is simplified and adapted to the socioeconomic conditions in Region II of Nicaragua. This allows for establishing the capacity and suitable use of land through key factors (slope, soil depth and current use). This **methodology** identifies overused areas based on the capacity of land use and determines suitable technologies of conservation at the farm level for those areas. These recommendations are based on Rural Rapid Appraisal (RRA), confirmed by a survey which allows for grouping of farms based on the traditional systems of production.

Chapter 4 (p. 35), "The biophysical framework of the upper sub-watershed", is a **diagnostic** of the region. The content of the chapter is as follows:

- 4.1 Climatic characteristics
 - 4.1.1 Wet lower mountainous tropical forest
 - 4.1.2 Wet subtropical forest
 - 4.1.3 Moist tropical forest transition to subtropics
- 4.2 Meteorological characteristics
- 4.3 Edaphic characteristics
 - 4.3.1 Parental material
 - 4.3.2 Mapping of soil series
 - 4.3.3 Taxonomic classification

4.4 Current land use

4.5 Flora and fauna

Also, the next chapter, "Results and discussions" contains some aspects of a diagnostic, such as the socioeconomic framework and general characteristics of the traditional systems of production.

MOLNAR, AUGUSTA, 1989. "A Review of Rapid Appraisal Tools for Use in Natural Resource Management Planning and Project Design and Execution", Rome, FAO, 90 p., GTZ.

The most important principle to understand regarding Rapid Rural Appraisal (RRA) is that this is not a methodology of information gathering, *per se*, but a creative, structured use of a particular set of investigative tools for assessing a situation, topic, problem, or sector. RRA and its "toolkit" can be described almost as a learning process. By creatively packaging social science tools for gathering and analyzing information, teams using such tools are able to assess natural resource management practices and the issues regarding their improvement in a more accurate and cost-effective manner than with conventional investigative methods.

The general methods that are employed in RRA to address the time constraint on data collection and analysis are: use of cross-checking or triangulation, extensive reliance on the available secondary data, use of detailed but open-ended interview guides to ensure pertinent issues are covered, and extensive team interaction to maintain a multi-disciplinary perspective. This paper does not go into extraordinary detail on each of these methods.

Different combinations of tools are used to appraise the topics of concern, and particular tools are used to disseminate a team's findings in a more digestible form for use by planners, project staff, local people, and government officials. Developed initially by social scientists to allow planners to get timely information about the social and cultural dimension of natural resource management problems, RRA has become a multi-disciplinary approach, which helps in gathering and analyzing information on a variety of technical subjects.

Properly carried out, survey and planning exercises using RRA methods can offer several advantages. One, they are multidisciplinary exercises and can include decision-makers as well as researchers, because the time frame is shorter and more flexible. Two, interview techniques are more open-ended than statistical survey questionnaires, and reduce the non-sampling errors resulting from poor question choice and lack of cross-checking to see that the informant and interviewer have understood one another. Three, the toolkit includes techniques which provide a

structure to the discussion that allows researchers and informants to see the situation from a shared perspective. Fourth, RRA methods allow for re-evaluation of the hypotheses during the course of fieldwork—such as is the methodology in long-term, qualitative research—so that questions can be adjusted in light of new information.

Individuals wishing to make use of RRA methodology find it difficult to choose among different approaches, to make decisions regarding the time and resources, including human expertise, required to undertake a survey or planning exercise, or to identify and resolve the potential pitfalls in gathering reliable and relevant information. With the proliferation of methods has come an increase in the number of new terms (jargon) which makes it difficult for the neophyte to understand what are the common elements of different approaches and to evaluate the trade-offs involved in choosing among them. This paper seeks to fill that gap. It is a guidebook to the promising approaches being developed. It serves several types of users:

1. people working in natural resource management;
2. donor agency staff responsible for designing projects in natural resource management;
3. people using RRA techniques who need to know where the potential pitfalls lie in the use of these techniques and how other people have resolved them; and
4. host country staff, who lack the RRA documentation to develop a comparative understanding of what different approaches have in common.

Methodological issues (p. 6): This toolkit includes proven techniques from interview and survey methodology adapted to the specific purpose of the planning or survey exercise. Methodological decisions are made by the team members on the basis of personal experience and professional understanding of ways to reduce bias in gathering information. The quality of a field survey using RRA is thus highly dependent upon the expertise of the individuals carrying out that exercise. This caveat has led to considerable controversy regarding the extent to which the use of RRA generates reliable information adequate to its purpose.

This paper tries to summarize the methodological issues (constraints) which have emerged in the application and development of the RRA toolkit, so that individuals making use of various manuals and approaches are aware of their existence. In addition, it compares the solutions to some of these issues used in different approaches, to help individuals in the practical selection of these alternatives. It is hoped that this presentation will provide a step in the eventual resolution of these issues as RRA becomes more widely used and more experience is gained.

The text goes on to illustrate a tentative framework for the use of the toolkit and provides detailed descriptions of each aspect, including examples of tables of data collected, and figures showing organizational techniques.

MONTAGNINI, F., *et al.*, 1992. *Sistemas Agroforestales: Principios y Aplicaciones en los trópicos (Agroforestry Systems: Origins and Applications in the Tropics)*, San Jose, C.R., Organization of Tropical Studies, 622 p., IICA- F08 M758.

Chapter 4, "Planning agroforestry systems: Characterization of an area", describes the methodology of a regional or micro-regional diagnostic for an agroforestry project. The following is an outline of the chapter:

1. What are the steps of characterization?
 - 1.1 What are the objectives of a characterization?
 - 1.2 What are the limits of the area to be characterized?
 - 1.3 What factors must be taken into account for characterizing?
2. Techniques for gathering data: using information sources
3. Techniques for gathering information: informal conversations, observations, interviews and questionnaires
 - 3.1 Samples
 - 3.2 Informal conversations
 - 3.3 Interviews and questionnaires
 - 3.4 Field observations
4. Analysis of the information gathered
 - 4.1 How is the information collected, organized and presented?
 - a. Maps
 - b. Tables
 - c. Figures
 - 4.2 How are the data for determining problems and priority needs analyzed?
 - a. Basic needs
 - b. Productivity
 - c. Ecological impacts of management

- 4.3 How is the information interpreted for determining the limiting factors?
- 4.4 How are the priority objectives of the intervention defined?
- 4.5 How is the possible role of the agroforestry systems determined?

Suitable techniques are presented for characterizing a situation with the purpose of identifying the problems, the forms of land use and determining the needs and the possibilities of putting the agroforestry systems into practice in the cases studied.

OEA, 1992. "Energía y Desarrollo: La experiencia de la OEA en el Istmo Centroamericano" (Energy and Development: The experience of OAS in the Central American Isthmus), Washington, D.C., 70 p., GTZ.

In 1979 the OAS requested that, during the 1980's, the Secretary General give special attention to the study of the better use of conventional and non-conventional sources of energy. Among other activities, the Multinational Project on Energy and Development in the Central American Isthmus was put into motion. The objective of this project was to assist, in a competitive way, the remote areas with conventional systems of generating electricity and transmission systems through replicable projects of non-conventional sources of energy.

Although this study does not take into account the idea of sustainability, the organization of the report can be used, especially a description of a **methodological focus** (7p.). The **methodological focus** attempts to coordinate and reach the proposed objectives of identification and preliminary formulation of specific projects on energy development, inserted into the framework of integrated socioeconomic development. It emphasizes new and renewable sources of energy and analyzing them in areas considered critical. The points of the study considered were:

Selection of critical areas: In direct collaboration with the national counterpart, an area was selected in each country, based on criteria or specific interests in which the relative importance varied from country to country. The criteria was basically related to energy, economic, social, geographic and political factors.

Estimate of the demand for energy of the selected area: A study was carried out on the dynamics of the demand for energy, taking into account the sources (commercial and non-commercial), the consuming sectors (residential and commercial, industrial, agricultural, transportation, public), and also the levels of population density (cities, towns, villages and farms). The existing supply of traditional energy sources was also analyzed.

Availability of energy resources: In the following phase, a study at the macro level was carried out on non-conventional sources of energy (new and renewable) in the zone, such as solar, wind, geothermic, biomass and

mini-hydraulic, which was reported in the regional diagnostics of energy and development. Using this as a base, the resources with interesting potential were determined, trying to utilize and specify in each one, its nature, volume and location.

Technological alternatives: The diagnostics examined the technological alternatives which would facilitate a rational use of the resources. This process leads to the formulation of demonstration projects in which complementary studies at the micro level were carried out.

Analysis of replicability: This analysis was carried out in the study area first and later, with less accuracy, at the national level. It gave an idea of the maximum volume represented by the manufacture and installation of equipment and the training of laborers and technicians in case of a massive implementation of the selected technologies.

Definition of regional programs related to the use of new and renewable energies. Projects with interesting characteristics for replication constituted the beginning of regional programs on new and renewable energy use, which could be part of broad integrated development programs based on the following points: gathering and processing field information, implementation, control and evaluation of projects, mechanisms of technology transfer and training, and finally a definition of institutional framework and financing.

PINNERS, E.; V. BALASUBRAMANIAN, 1991. "Use of the iterative diagnosis and design approach in the development of suitable agroforestry systems for a target area", *Agroforestry Systems* 15: pp. 183-201, CATIE- INFORAT #30971.

The process of iterative diagnosis and design with the active participation of farmers and extension agents was found effective in identifying appropriate agroforestry systems for farmers in the Bugesera and Gisaaka-Migongo regions of Rwanda, who participated in the Rwanda Farming Systems Research Project of 1983-88. The traditional farming systems and land use of the area and the research approach used are described, including maps of the studied areas showing ecological zones. Extension agents and farmers participated in a baseline survey, identifying constraints, performing station trials and on-farm testing of technologies under development. The only stage in which the farmers did not participate was the initial selection of technologies for testing. Periodic reevaluation of research assumptions and technology designs was based on feedback from farmers and extensionists through regular visits to station trials, early initiation of on-farm testing, and interaction with farmer cooperators through informal discussions and formal surveys focused on specific agroforestry technologies. A copy of the questionnaire is included as an annex at the conclusion of the article.

It is decided that valid conclusions can be drawn without statistics, by employing several farmer-participatory approaches and pooling and properly interpreting the data obtained from them. It is also concluded that if researchers and development agents do not consider the farmers' real needs, circumstances, available resources and management capacity with regard to tree planting, they will fail in identifying and extending suitable agroforestry systems for any region.

PLOTKIN, M.; L. FAMOLARE. "Sustainable Harvest and Marketing of Rain Forest Products", Washington, D.C., Island Press, 325 p., GTZ- #358.

This book is based on papers presented at a conference on "The Sustainable Harvest and Marketing of Rain Forest Products". The intent of the conference was to pull together a wide variety of information on the potential utility of rain forest plants and organize it in a manner both relevant and interesting to conservationists, botanists, anthropologists, economists and the general public.

The book is divided into six sections: The first focuses on the methodologies for collecting and utilizing ethnobotanical data; the second is an overview of the potential of nontimber forest products; because palms figure so prominently in many sustainable development projects, section three critically examines some of the more promising species; the focus of section four is the difficulty of development of new therapeutic compounds from medicinal plants; section five consists of several important case studies of nonmedicinal products in the market place. But the most significant consequences of the conference came at the end when the attendees set to work at drawing up a set of guidelines for how new products can be brought to market in an ethical, ecologically and sociologically sustainable manner (p. 310).

One case, which particularly applies, because of its focus on a particular microregion and the inclusion of a good description of the methodology, is "The Sustainable Management of Nontimber Rain Forest Products in the Si-a-Paz Peace Park, Nicaragua", (pp. 118-124).

The methodology consists of comparing systems of natural forest management by an international research team. The two systems are varying extraction (controlled felling and extraction) and post-harvest silviculture (modified liberation and uniform treatment). Both forest damage and regeneration of non-timber forest products occur within these experiments. Stratified random sub-subplots (5 meters by 2 meters) totalling 10 percent of each of five permanent subplots for measuring regeneration (0.1 hectares each) are located within each repetition (3 one-hectare plots with 30-meter borders) of each treatment. Within each subplot all the useful plants are inventoried and vouchered with the help

of a local, knowledgeable informant and data is taken on use and plant community characteristics (species richness, diversity, density, and cover).

For comparison, the forest management techniques of campesinos within the region are being studied. Transects are laid through the campesino forest plots and stratified, and random subplots (5 meters by 2 meters) are located using a random numbers table. All subplots are inventoried, plants vouchered, and data taken exactly as described above.

The conclusions drawn from the study are mostly based on the study of one particular secondary forest within the region.

RAINTREE, J.B., 1987. D & D User's Manual: An introduction to agroforestry diagnosis and design, Nairobi, Kenya, ICRAF, 110 p., GTZ- #295.

This manual has been written as a user-friendly introduction to ICRAF's methodology for agroforestry diagnosis and design. The key to effective use of the "D & D" method is flexibility. Although the basic logic of D & D is quite generally applicable, the specific procedures and survey instruments may need to be adapted to fit the needs of the user. The key features of the D & D approach are:

- Flexibility. D & D is a flexible discovery procedure which can be adapted to fit the needs and resources of different users.
- Speed. D & D has been designed with the option of a "rapid appraisal" application at the planning stage of a project with in-depth follow-up during project implementation.
- Repetition. D & D is an open-ended learning process. Since initial designs can almost always be improved, the D & D process shouldn't end until further improvements are no longer necessary.

The elementary D & D concepts and baseline procedures are described in the first section of basic principles and procedures (p. 6). A table listing the D & D stages (prediagnostic, diagnostic, design & evaluation, planning, and implementation), the basic questions to answer, the key factors to consider, and the mode of inquiry for each stage is outlined and presented as a reference tool for reorientation at any stage of the particular project.

The focus of D & D is the land use system. Since different systems are likely to have different problems and potentials, it follows that each distinctive land use system must have its own diagnosis and corresponding design. This doesn't mean that D & D results are site specific since the same basic land use system may exist in many sites. The selection of sites representative of important land use systems is an essential aspect of the art of D & D. For the purposes of a D & D exercise, a land use system is defined as a distinctive combination of three interrelated factors: the land resources exploited by a particular

technology to satisfy the production objectives of a particular type of land user.

This definition contrasts with other commonly used definitions which do not formally recognize the land user as part of the system. The difference is more than just semantic, since all three elements are essential to a functioning land use system. If the human element is left out of the picture, it becomes too easy to overlook the objectives around which the existing land use system is organized. By consciously attempting to design with the grain of the system rather than against it, the D & D methodology helps to avoid the kind of design error that results in technically and environmentally feasible but somehow "non-adoptable" agroforestry technologies.

Basic procedures and key concepts are followed by more detailed suggestions on procedures for national research programs, with the understanding that these must be selected and adapted to fit the circumstances. Some of the most important modifications of the procedures suggested for formal research programs arise from creative adaptations of the methodology by community-based fieldworkers doing informal, participatory agroforestry research and development, as discussed in "the view from the village" (p. 18). Next comes a case study example of the open-ended D & D learning process, as it was experienced in an agroforestry project in Kenya. The manual concludes with D & D in action—a pictorial dramatization of the D & D process which may help in gaining an overview of the D & D process as it might be implemented by a national agroforestry research program.

Although the manual is a condensed version of the type of explanation which would be most useful, it does contain some very straightforward tables and figures showing the diagnostic and design process. The table on page 6 may be especially useful, showing the basic procedures from prediagnostic to diagnostic to design and implementation.

SOBREVILA, C.; P. BATH, 1992. Evaluación Ecológica Rápida: Un manual para usuarios de América Latina y el Caribe (Rapid Ecological Evaluation: A user's manual for Latin America and the Caribbean), Arlington, Virginia, The Nature Conservancy, 232 p., GTZ.

A Rapid Ecological Evaluation (EER is the Spanish acronym) is a flexible method that is used to obtain rapidly and apply biological and ecological information for making effective conservationist decisions. These methods integrate various levels of information, from satellite images and aerial photographs to very intensive field evaluation. The EER produces updated ecological maps and reports that describe the vegetation, flora, fauna, as well as human activities and current land use of a microregion. The synthesis and analysis of this information helps make appropriate recommendations for land use and conservation activities in the study areas. The EER also provides baseline information for programs of long-term monitoring of natural resources.

The steps involved in carrying out a EER are: (1) Definition of objectives (2) Obtaining data (3) Data analysis (4) Verification of analysis (5) Generation of products (6) Recommendations and applications. Page 10 includes an example of an EER at the local level.

The EER methodology has been designed to deal with the lack of detailed information or time constraints. The manual is organized into five modules that reflect the key phases of an EER. The order of the modules reflect the sequence of activities that work well for developing an EER. The modules are:

1) Establishing objectives for and planning of the EER

Before initiating an EER, it is necessary to clarify its objective and to identify the users of the information. This will enable a clear subsequent identification of the type of data required and, thus, ensure a good analysis which will provide necessary recommendations for the area under study. Also, it is important to clarify this point from the start in order to ensure that the budget is adequate for the work required.

2) Analysis of remote sensing images.

This section covers the acquisition of secondary information and images on remote sensing (satellite images and aerial photographs), and the processing and analysis of this information for elaborating a map on vegetative covering and land use.

3) Aerial reconnaissance

In extensive, remote and isolated areas where there is limited access to highways and rivers, aerial reconnaissance served as an additional tool for making general observations and determining threats to the vegetation and recording, through photography, logistical aspects of the site from the air. These flights allow for the obtaining of visual and photographic information on the vegetative cover and land use in greater detail than possible at higher altitudes. This information can be presented on larger scales (for example, 1:5,000 to 1:1,000) than the analysis of aerial photographs (generally from 1:30,000 to 1:20,000) or satellite images. These observations could compliment the interpretation of the satellite images and photographs of a smaller scale to better understand the area under study. These flights also help to obtain information on areas not revealed by other images (due to problems of cloudiness).

5) Field work

Field evaluations are the essence of many disciplines of basic sciences (biology, geology, soil sciences, etc.) since they allow for obtaining primary information or verifying the data and analysis obtained in the previous activities.

6) Integrating the results

This section deals with the integration of the different levels of information obtained for the EER: information gathered from the analysis of images, aerial flights and field work. A final map of vegetative cover is produced using the information generated during the aerial flights to verify and validate the preliminary map on vegetative cover. The information is also integrated through the identification of potential sites for conservation and their relative ranking.

SOLORZANO S., R., 1986. "Diseño y aplicación en Costa Rica de una metodología para la planificación operativa de un sistema de reservas forestales y zonas protectoras" ("Design and application of a methodology for operative planning of a system of forest reserves and protective zones in Costa Rica"), Turrialba, C.R., CATIE, 231 p., CATIE- Thesis S689d.

Although the purpose of this study is not intended to be a **diagnostic**, it includes an explanation of a methodology used to review the current situation of a microregion. The preliminary step of the **methodology** was to review the different processes of planning and the resulting experiences of those processes. From the case studies, the flow or sequential aspect was reviewed, since the plan was not to utilize an existing methodology but rather to design and test a methodology and to improve it, if necessary, after applying it.

With the information obtained from the review of the experiences and methodologies, and the discussion with those responsible for the areas and the department, a sequential methodological sequence was proposed with the following steps (see figure No. 2, p. 64): a diagnostic workshop; an analysis of the diagnostic; preparation of instructions for preparing the operative plans; a training workshop; preparation of the plans of the areas and the department; and obtaining a master plan.

The first two steps relate most directly to the diagnostic process:

Diagnostic Workshop: A workshop was set up with those responsible for the areas and general administration. In the workshop, the situation of the system, common problems in the areas, limitations, conflicts and bottle-necks were discussed and updated. Also, policies, objectives and priority of the areas were reviewed. A **diagnostic** of the system and the state of planning as well as their successes and failures is being prepared at present.

Analysis of the diagnostic: This includes information on the forestry situation in Costa Rica, especially the forest reserves and protective zones.

VALLESTER P., E., 1986. "Diseño de una metodología para planificar el manejo y desarrollo de refugios de vida silvestre en el trópico americano" (Designing a methodology for planning the management and development of wildlife refuges in the American Tropics), Turrialba, C.R., CATIE, 336 p., CATIE-Thesis V185.

"This study was carried out for the purpose of designing a specific methodology for planning the management and development of wildlife refuges in the American tropics.

The conceptual framework on planning the systems and/or subsystems of wildland areas and the methodologies for planning wildland areas for wildlife refuges is discussed through a review of the literature. It is followed by an exposition of the importance of the management of wildlife refuges, as well as a range of methods and techniques for controlling the natural habitat and managing wildlife."

"A description and a critical analysis of the process was made in the designing of the methodology. It is based on a literature review, analysis and assessing of prior methodologies for planning the national parks, multi-purpose areas, forest reserves and wildlife refuges. From each of these methodologies the components that could be useful for integrating the methodology in preparation were extracted, whether in their actual form or with small or large modifications on the basis of planning a wildlife refuge and other similar categories of management."

"The following procedures were used to design the methodology for planning the management and development of wildlife refuges in the American tropics: previous activities; compilation of basic information and antecedents; inventory of resources; recording of impacts on wildlife refuges in the region; establishment of specific objectives for the refuge; zoning; borders; management program; integrated development; time-line development; publication and distribution of the management plan."

"The proposed methodology is organized in 20 basic steps: previous requirements, compilation of basic information and antecedents, a synthesis of the information and reconsideration of the definition of the region and study area, field inventory of resources, a synthesis of the information at the study area and conservation unit levels, verification of

the final table of contents, a list of figures and tables, a review of the work plan, selection of species of special interest, a definition of specific objectives of the refuge, zoning, marking of the boundaries of the refuge, an analysis of limiting factors, verification of zoning and boundaries, preparation of management programs, preparation of an integrated development program, an evaluation of the budget plan, the sequence of development, publication of the management plan, distribution of the management plan, approval and execution of the plan, evaluation of the plan, evaluation of the results, and a review of the management plan."

This study contains a host of ideas on the methodology of the diagnostics of microregions. There are explanations for each step of every stage incorporated into this work. If the explanation is not detailed enough, the author refers to the extensive bibliography included in the study.

CHAPTER III

DIAGNOSTICS WITH DETAILED EXPLANATIONS OF THEIR METHODOLOGIES

ALFARO A., M., 1982. "Evaluación sobre las reservas forestales y zonas protectoras de Costa Rica y diseño de una metodología para la planificación de sistemas nacionales y estrategias, utilizando estas categorías de manejo" ("An evaluation of the forest reserves and protected areas in Costa Rica and the design of a methodology for planning national systems and strategies using those types of management categories"), Turrialba, C.R., CATIE, 184 p., CATIE- 333.75097286 A385.

The objectives of this study are:

1. To evaluate the current situation of the forest reserves and protected areas in Costa Rica, especially their administrative and socioeconomic characteristics and current management in a group of selected areas.
2. To produce and analyze basic information on the various physical and ecological aspects and the current use for each area.
3. To design a theoretical methodology that would guide the national planning systems of forest reserves and/or related management areas and strategies for their management that are applicable in the American tropics.

In order to accomplish the first objective, two questionnaires were created and completed by the staff responsible for managing the areas. Also, various documents and bibliographies were compiled and analyzed in order to accomplish the first and second objectives. Maps were created for each area, and field work was carried out. The third objective, designing a methodology, was accomplished through revision and analysis of the existing examples and experiences from other countries in the preparation of plans and strategies for various other management categories and using the experience acquired through field research in Costa Rica.

The proposed methodology is a sequence of ten steps, which explain in detail how to evaluate existing and potential areas and plan a national system of forest reserves and /or related types of areas and a strategy for their management applicable in the American Tropics.

The 10 steps are:

- I. Elaboration of a conceptual framework;
- II. Identification of potential areas at the national level;
- III. Study of the potential areas identified;
- IV. Classification and /or reclassification and selection of the potential areas studied
- V. Comparison of the selected areas with the objective of forest management identified in the country;
- VI. Mapping of the proposed national system;
- VII. Ranking of the selected areas for forming part of the proposed national system;
- VIII. Identification of priority activities for managing the proposed national system;
- IX. An analysis of the institutional capacity of the State for managing the proposed national system;

X. Elaboration of a preliminary strategy for the management of the national system in the short, medium and long-term.

Later in chapter 4, there is an explanation of the requirements for applying the methodology. Those requirements include the type of equipment and materials necessary and the availability of the means of transportation and other resources.

ALLEN, P.; D. VAN DUSEN, 1988. "Global Perspectives on Agroecology and Sustainable Agricultural Systems, v. 2", Santa Cruz, Calif., Regents of the University of California, 738 p., GTZ- #867.

This compilation of conference papers includes "Agroecological Typification of Traditional Farming Systems in Central Chile" (pp. 463-468), a study targeting the "La Palma" community in central Chile. The project studied traditional agroecosystems, particularly constraints and patterns of resource use and production and the widespread use of "inappropriate technologies". The purpose was to be able then to suggest management systems which would allow more efficient organization and utilization of the farming space and the conservation of soils.

The explanation of the methodology utilized in the study includes a conceptual model (p.469). The main sources of information used to begin the study were acquired through field surveys, participant observation, interviews and library consultations. Those sources developed through these methods of data collection included:

- a. Farmers' needs, goals and rationale, especially farmers' attitudes towards risk.
- b. Description of agrosystems emphasizing the spatial and temporal patterns of productive activities, land, labor and capital resources, and the influence of external systems. Data on farmers' land include: size of farm and farm units, ownership, permanency of use, landlord-tenant relationships, land quality, water availability, location in relation to markets, roads, etc. Relevant characteristics of labor include: number, age, and sex of family members and workers, division of time between on-farm and off-farm activities, extent and nature of cooperative efforts, other factors that influence allocation of time and effort, etc. Data on capital refers to physical and financial assets such as tools and equipment, buildings, and improvements of the land, livestock and other assets capable of being sold to meet farmers' needs, cash from sale of crops, animal products, handicrafts, access to credit, etc.
- c. Agroecosystem dynamics and interactions: at this stage principal crops and cropping practices were described, including rotations and crop

combinations, multiple cropping patterns, varieties used, yields, and schedules for the various activities (seedbed preparation, planting, weeding, etc.). Direct interactions between farm components, where products or outputs of one component are used in the production of another component, as well as farmers' efficiency in using land, labor and capital were described. Interactions between people and their local environment, the social relations of production, and interactions between farmers, the market, industry and government agencies were also analyzed.

Data was obtained through the study by measuring performance of various crops under differing conditions through four main indicators:

- a. **Sustainability:** the ability of an agroecosystem to recover and maintain production through time.
- b. **Stability:** the constancy of production through time.
- c. **Productivity:** a quantitative measure of the rate of and the amount of production per unit of land or input.
- d. **Equity:** a measure of how evenly the products of the agroecosystem are distributed among the local producers and consumers.

Proposals developed through these methods, which have the potential of improving the self-reliance of the local farmers, concentrated on reorganization of production space, soil conservation practices and use of appropriate technologies.

COSTA RICA, GOBIERNO DE, 1990. "Estrategia para el desarrollo institucional de la reserva de la biósfera La Amistad" ("A strategy for institutional development of the La Amistad biosphere reserve"), San José, C.R., Ministry of Natural Resources, Energy, and Mines, 174 p., IICA- P01 M663e.

The first part of this document, financed by C.I. and OAS, is a diagnostic of a microregion. "The objective of this joint effort has been to establish a strategy to allow the organization responsible for managing this unit to orient their management policies based on the concept of a biosphere reserve. Also, it would serve as a frame of reference for activities oriented toward an integrated development of the region. In accordance with the prevailing national and regional and institutional context, the role of the La Amistad biosphere reserve (RBA) can be as guarantor for the type of development adequate in the region."

The diagnosis that was carried out is very detailed and used various maps and charts to illustrate the current situation in the biosphere. The structure of the presentation of the diagnosis is as follows:

1. National conservation policy and strategy
 - 1.1 National antecedents and policies on conservation
 - 1.2 National conservation strategy
 - 1.3 Establishment of a national system of conservation areas
2. Process of land occupation of RBA
3. Regional development policy
 - 3.1 National system of planning
 - 3.2 Regional development councils
 - 3.4 Regional projects
 - 4.0 Legal and administrative framework
 - 4.1 Administration of RBA up to 1990
 - 4.2 Legal framework
 - 4.3 National conservation strategy

5. Population and standard of living
 - 5.1 Area of influence
 - 5.2 Urban areas
 - 5.3 Transportation network
 - 5.4 Basic demography and migrations
 - 5.5 Health
 - 5.6 Education

6. Land tenure
 - 6.1 Land tenure in the conservation units
 - 6.2 Land tenure in indigenous communities

7. Natural resources
 - 7.1 Climate and bioclimates
 - 7.2 Flora and special ecosystems
 - 7.3 Wild life
 - 7.4 Watersheds

8. Natural risks
 - 8.1 Droughts
 - 8.2 Storms
 - 8.3 Erosion
 - 8.4 Landslides
 - 8.5 Floods
 - 8.6 Risk of seismic activity
 - 8.7 Risks in specific areas

9. Indigenous communities
 - 9.1 RBA indigenous reserves
 - 9.2 Production
 - 9.3 Health
 - 9.4 Infrastructure
 - 9.5 Services
 - 9.6 Education
 - 9.7 Base organizations
 - 9.8 Development projects in indigenous reserves

10. Ecotourism
 - 10.1 National policy
 - 10.2 RBA region
 - 10.3 Eco-tourism in RBA

11. Binational aspects**11.1 Legal framework for border cooperation****11.2 Binational programs and actions"**

The goals of this project, integrating various organizations and institutions with interests in the region, are development and conservation of this area using the strategy developed among the participants.

ESCALIER H., M., 1988. "Evaluación del uso forestal y formulación de directrices para la conservación de tierras en el Parque Nacional Tunari, Cochabamba, Bolivia" ("An evaluation of forestry use and formulation of the norms for conserving lands in the Tunari National Park, Cochabamba, Bolivia"), Turrialba, C.R., CATIE, 233 p., CATIE- Thesis E74ev.

This study was carried out in the sub-watershed of the Tunari National Park, in the department of Cochabamba, Bolivia. The objectives of the work were: 1) to determine, in a first approximation, the suitability of land for forest uses; 2) to formulate norms for conserving lands suitable for forestry, as much for plantations as for the participation of rural communities in the development process.

Chapter 2, "Revisión de literatura (review of the literature)" (p. 5), constitutes a **diagnostic** of the current situation in the microregion. Some aspects included in the **diagnostic** are: forest production in the zone; the land use system; requirements for growth, management and conservation; classification of land use capacity; the historical context of land tenure in Cochabamba; legal and institutional aspects of the watershed of the park; and community participation related to forestry aspects.

Chapter 3, "Materials and methods" (p. 43), includes descriptions of the following steps: sources of information; materials and equipment used; location of the study area; biophysical resources; geology and geomorphology; physiography; soils; life zones; slope; climatic classification; requirement of the forest plantations; socioeconomic resources; social, economic and environmental analyses; current use of the land; the prospect for forest plantations of the Tunari Park; determining the land use capacity; classifying the land use capacity; formulating integrated guidelines. Each step includes an explanation of the method or methodology used for acquiring the necessary information with references to the studies or systems carried out.

The information for the study was obtained through personal interviews with farmers and staff associated with the park, from previous studies, and through field and office work involving various technical teams.

FREEMAN, D.; D. EREL; A. DEHTER; G. NAVEH; E. KHVOUS, 1987. "Proyecto de planificación, región provincia de Chiriquí, República de Panamá" ("A planning project, regional province of Chiriquí, Republic of Panama"), Rehovot, Israel, Centro de Estudios Regionales Urbano-Rurales (CERUR), 440 p., IICA- E14 F855.

The study contains a very detailed explanation of the methodology. The most important aspect of this explanation is the work flow. Graph 1 summarizes the methodological steps involved in the planning process of the integrated rural development in the region. Later, there is a brief description of the operative stages carried out by the planning team during the implementation stage of this project. The order of the steps in the work, relative to the diagnostic, is as follows:

- 1) "Determining the objectives of the development: In the first stage the planners formulated the objectives of development conceived at the national level and defined, in overall terms, the primary objectives of development at the regional and local level, according to the terms of the plan."
- 2) "Gathering information and reconnaissance of the region: Although this document deals with an "exercise" of planning, it is based, to the extent possible, on up-to-date, reliable data. Information was obtained from printed material and verbal communication and observations from field trips to the region. The combination of data and maps studied allowed the authors to divide the region into ecological zones of homogenous character, which later served to plan the distribution of the activities within it."
- 3) "Diagnostic of the region: On the basis of the information and observations obtained during the field trips, planners were able to elaborate the diagnostic of the economic, social and institutional situation which would serve as a point of departure for the macro and sectorial planning."

The explanation of the diagnostic in this region, which begins on page 18, is quite complete. The presentation consists of five chapters, six maps and almost one-hundred pages of a detailed description of the region. The titles of the chapters in the section are: Chiriquí Province —General

characteristics; Delimitation of Ecological Zones and Political Administrative Divisions; Demographic Characteristics; Social Aspects; and a **Diagnostic** of the Economic Sectors.

Another aspect of this **diagnostic** is that in certain sections, for example page 76, where the aggregate value of the secondary sector was determined, there are explanations of the **methodology** used to determine some characteristics of the region.

FUNDACION PARA EL DESARROLLO DE LA REGION CENTRO OCCIDENTAL, 1975. "Diagnóstico del área Boca de Aroa Tucacas, Chichiriviche" ("A Diagnostic of the Boca de Aroa Tucacas, Chichiriviche"), Barquisimeto, 246 p., CATIE-333.7209876 F981.

Although this study does not take into account sustainable development, the entire document is a **diagnostic** of this region, which can be useful as an example. An outline of the contents is as follows:

1. A general description of the area
2. An analysis of the environment
 - 2.1 Relief
 - 2.2 Genesis of the geomorphological forms
 - 2.3 Soils
 - 2.4 Climate
 - 2.5 Hydrology
3. Terrestrial ecology
 - 3.1 Environmental conditions
 - 3.2 Description of the current vegetation
 - 3.3 Determination of the life zones
 - 3.4 Terrestrial ecosystems, their vegetation and other living components
4. Littoral and marine geology with preliminary studies on marine biology
 - 4.1 The physical conditions and their influence on the littoral ecosystem
 - 4.2 Bird life —nesting and predators
 - 4.3 Sea fish and fishing in the study area
 - 4.4 Algae and invertebrates of the marine ecosystems
 - 4.5 Current and potential contamination of the beaches
5. Infrastructure
 - 5.1 Transportation
 - 5.2 Communications
 - 5.3 Electricity
 - 5.4 Touristic infrastructure

6. Land use and land tenure
 - 6.1 Rural use
 - 6.2 Land tenure

7. Socioeconomic aspects of the population
 - 7.1 General characteristics
 - 7.1.1 Volume and growth
 - 7.1.2 Population composition
 - 7.1.3 Spatial distribution of the population
 - 7.1.4 Types of population concentration
 - 7.2 Economic characteristics
 - 7.3 Qualification of the population
 - 7.4 Level of social well-being
 - 7.5 Social aspects
 - 7.5.1 Description of the current situation
 - 7.5.2 Social characteristics of the population
 - 7.5.3 Participation of the population in tourism and trends
 - 7.5.4 Perception and expectations of the inhabitants in the area of tourist development

8. Economic structure of the area
 - 8.1 Agriculture
 - 8.1.1 The most important crops and their economic repercussions
 - 8.1.2 Employment generated by the agricultural sector and its possible potential
 - 8.1.3 Effects of agrarian reforms in the current agricultural structure and their influence in the area
 - 8.2 Manufacturing
 - 8.3 Commercial sector
 - 8.4 Service sector

IICA, 1981. "Desarrollo integral agrícola de la Franja Transversal del Norte: Diagnóstico integral –SIGUANHA" ("Integral agricultural development of the Northern Franja Transversal: Integral diagnostic– SIGUANHA"), Guatemala, 68 p., CATIE-330.97281 G918d.

This document "constitutes the basis for elaborating plans of suitable production for the resources and conditions of the community studied. The work thoroughly examines the current situation of one of the six pilot communities selected by the Support Project IICA/FSB (Simón Bolívar Fund)."

The study makes reference to aspects of natural resources, agriculture, socioeconomics, infrastructure, business organization, the legal situations of the communities, and a chapter that includes conclusions and recommendations summarizing and showing the relevant aspects related to the development of the "SIGUANHA" community in Guatemala.

The eight aspects that are analyzed in the chapters of this diagnostic, which is very basic, are:

- 1) Description of the community
- 2) Natural resources: lands; current land use; crops; recommended use of lands; and maps.
- 3) Human resources: availability of labor; and the current use of labor.
- 4) Infrastructure and services: external accessibility; internal accessibility; means of transportation, community services; and demand for infrastructural services.
- 5) Socioeconomic aspects: population; provenance and ethnic characteristics of the population; housing; education; health and mortality; occupational aspects.
- 6) Administrative and organizational aspects of businesses: current organization and function; plans of production and technical assistance; and problems encountered.

- 7) **Legal aspects: type of land tenure; current pattern of land distribution, its problems, advantages and disadvantages.**
- 8) **Agroeconomic aspects: Size and use of exploitations; current technology used for cultivation; perennial crops; inventory of fowl and livestock; credit and technical assistance; attitudes and values of agricultural work; and limiting factors of agricultural production.**

IICA, 1987. "The fruit sub-sector in the Windward Islands: **Diagnosis-Strategy-Actions**", San Jose, C.R., 211 p. + indices, IICA- IICA PM A2/LC 87-002.

The objectives of this joint venture between the Caribbean Development Bank (CDB) and IICA were the following:

1. To carry out a practical study on production and marketing of selected agricultural commodities to determine key current production and marketing constraints and alternative solutions.
2. To identify and prepare specific project profiles to deal with the exporting of specified produce from the four Windward Islands of the Caribbean for extra-regional markets, as determined feasible.

Conceptual Framework: The study was based on the fact that successful marketing necessitates being able to supply continuous quantities of quality produce at competitive prices, assuring that the commodity is available at the proper place and time. The identification of the constraints preventing these conditions from being met in the Windward Islands was undertaken using a comprehensive commodity systems methodology developed specifically for this study. The analysis covered the following four broad areas: macro-environment and institutional structure; pre-production, production and harvest; postharvest handling; and marketing. Figure 1 (p. 11) provides a graphic presentation of the production/marketing system required for effective Joint Marketing (a significant recommendation of the study) from the Windward Island sub-region and its macro-environmental support system. This model indicates that for sufficient volumes of quality produce to reach regional and extra-regional markets opportunely, and at competitive prices, a series of organizational conditions must be met. An explanation of these conditions is then given.

Pages 5-7 contain a discussion of the methodology used in the study, which outlines the food system, describes the organization of the study and the study execution, and gives a short explanation of the presentation of information.

The food system in this case was considered to include all those actions taking place from the planning of production through to the point

of retail to consumers. With this broad definition of the fruit production/marketing system, the participants can be categorized into four groups, based on similar interests and characteristics. The first two groups are primarily profit motivated, the second two are service and development oriented.

Group A: Capital deficient private sector participants: Includes small farmers and owner/operators of small agro-processing operations.

Group B: Capital intensive private sector participants: This group includes large farmers, importers, exporters, wholesalers, retailers and owners of large-scale agro-processing operations.

Group C: National development institutions: Public sector institutions as well as non-governmental organizations assisting in the development process.

Group D: Donor, regional and international agencies: Within this category fall a wide range of institutions providing financial and technical assistance to both private and public sector institutions.

Organization of the study consisted of cooperation of coordinators from IICA and CDB. The IICA marketing department was responsible for overall study coordination and execution.

Study execution: In 1985, a case study was implemented in St. Lucia to generate the desired information concerning terms of reference and desired information in each of the Windward Islands.

Presentation of information: The report is divided in three parts: Part I is the Introduction and the Conceptual Framework for the Diagnosis. The results of the Diagnosis are presented in Part II. Within Part II, conclusions are presented by area, i.e. macro-environment, and organizational structure; and marketing, by commodity and by regional organization. Part III presents a strategy for dealing with the identified production/marketing constraints and seven Project Profiles outlining the key elements of the Sub-regional strategy. This strategy is based on a series of summary tables which identify "major areas requiring action", by country, indicating the priority areas.

The entire second section of the text (pp. 12-120) contains a detailed explanation of the diagnosis portion of the work. The diagnosis was

carried out by inter-disciplinary teams of national technicians coordinated and supervised by IICA production and marketing specialists. The diagnosis is divided into seven sections:

- organizational structure & macro-environment
- preproduction, production & harvest
- postharvest handling
- domestic marketing
- export marketing
- individual commodities treated in the study
- regional marketing activities

The results of the diagnosis are presented by country and commodity, in addition to a regional overview of the four areas mentioned above. A brief analysis was carried out on the two principal regional experiences in marketing. A summary of the lessons learned from these two experiences is included. Appendices to the diagnosis include summary conclusions, trade statistics and baseline information on farmers organizations, all on a country basis.

INSTITUTO DE INVESTIGACIÓN AGROPECUARIA DE PANAMÁ, 1980. "Diagnóstico de pequeñas y medianas explotaciones agropecuarias en tres áreas de Panamá: Aserrío de Gariché, Progreso y Guarumal." ("A diagnostic of small and medium farms in three areas of Panama: Aserrío de Gariché, Progreso and Guarumal"), Panamá, 334 p., CATIE- 333.709862.

This document is the final phase of the first stage with which the coordination of efforts leading to an optimal and sustainable level of agricultural development in Panama was initiated.

The **diagnostic**, besides serving as a preliminary guide in the search for solutions to the limiting factors by generating, developing and transferring viable technological alternatives, represents the first combined effort of the institutions in the public agricultural sector directed towards achieving a single objective: agricultural development.

The three microregions were analyzed as follows:

1. General description of the county
 - a. Location
 - b. Environmental conditions (climate, life zones, soils)
 - c. Social aspects (population, education, housing, health)
 - d. Economic aspects (land tenure, size of cultivate area, land use, characteristics of the uses)
 - e. Infrastructure and services
2. Specific description of the farm and the systems of agricultural production
 - a. Farmer
 - a.1. General characteristics
 - a.2. Farmer's attitudes
 - b. Systems of agricultural production
 - b.1. Description
 - b.2. Limiting factors

The principal characteristics of the research areas are as follows:

1. Concentrating on the efforts and resources of research in the selected areas as a way of rationalizing them.

2. Incorporating the farmers into research by establishing experiments on their farms.
3. Orientating research towards an integral study of all the factors that, through their inter-relationships, define a production system.
4. Forming multi-disciplinary and inter-institutional teams as a way of integrating technical and human personnel into the process of generating and transferring technology.

The principal objective of the diagnostic is to provide a clear understanding of the current situation in each of the areas with respect to their potentials and limitations, allowing us to orient ourselves in a more effective manner in agricultural and livestock research for developing improved and technologies adapted to the reality of the farmer.

IICA, 1977. "Diagnóstico preliminar sobre las condiciones socio-económicas de los municipios de Cabañas, Santa Elena y Yarula, Departamento de la Paz" ("A preliminary diagnostic of the socioeconomic conditions of the municipalities of Cabañas, Santa Elena and Yarula, Department of la Paz"), Tegucigalpa, Honduras, 96 p., CATIE- 301.917283 H771.

"The specific objectives of this project in Honduras are:

- 1) Efficient use of resources and the preservation of environmental quality;
- 2) Identification of the use of technology adapted to the socioeconomic conditions.

The accomplishment of the project objectives implies the need to have a socioeconomic diagnostic which provides a basic knowledge for carrying out activities in a systematic and continuous way in order to develop the project area in the short run." (p. i)

"The methodology used consisted of researching the required data through a survey which includes a representative sample of farmers. This survey was complemented by secondary information gathered from agricultural and population census, as well as other sources of information.

The work was prepared and organized for development according to the terms of reference that outlined the diagnostic, on the basis of a plan of analysis that considered the preliminary results and observation in the information gathering stage.

Therefore, it was determined that the information should be treated as a stratified and random sample to avoid significant variations between observations, so that the group of farmers to be researched would have a structure similar to that of the total number of farms in the three municipalities.

On the other hand, based on the field information obtained in 1977, and additional information obtained from the 1974 census, it was determined that extrapolating coefficients would not be used, because

over time they could present considerable variations that could cause possible errors. Nevertheless, criteria of tendencies were used, allowing for accommodating the census information to the structure of the sample in the few cases in which field information was lacking." (p. 3)

"This study constitutes the beginning of a diagnostic that attempts to be dynamic and functional for programming and executing project activities. For that reason, it will be used in the primary elaboration of sub-projects that will be perfected to the extent that they obtain results from the agroeconomic and social studies." (p. i)

The study contains an analysis of human resources (p. 15) with the following steps:

- 1) Urban and rural population
- 2) Population density
- 3) Economically active population by sex
- 4) Population dedicated to agricultural activities

The work also includes a section dedicated to the social aspects, and an outline of that section is as follows:

- 1) Education
 - 1.1) Illiteracy
 - 1.2) Formal education
 - 1.3) School-aged population
 - 1.4) Highest level of education completed
 - 1.5) Type and number of schools
- 2) Family composition
- 3) Organization for production
- 4) Other organizations
- 5) Leadership

Another aspect of this diagnostic is the section on institutional services which consists of four topics:

- 1) Technical assistance
- 2) Agricultural research
- 3) Agricultural credit from the national bank
- 4) Other institutions providing credit

OEA, 1987. "Plan de ordenamiento y manejo de las cuencas de los ríos San Miguel y Putumayo" ("A plan of land use and management of watersheds in the San Miguel and Putumayo Rivers"), Washington, D.C., p. 273 p., GTZ- RC P10 014.

This document is an example of a very comprehensive **diagnostic** of a region, with an emphasis on sustainability. The titles of some chapters are as follows:

- Description of the region
- Natural resources
- Environment
- Social aspects
- Physical infrastructure
- Economic activity
- Regional analysis

The objectives for developing the region of the watersheds of the Putumayo and San Miguel Rivers, shared by the governments of Ecuador and Colombia, can be synthesized in the following manner:

Identification of the potential use of natural resources for sustainable development in the area, consolidating the current occupation and orienting future settlements.

- Improvement of the well-being of the population, generating productive activities and sources of employment, as well as the installation of the basic physical and socioeconomic structure in a manner compatible with the desires of the inhabitants, natural resources and the ecological conditions of the region.
- Bi-national integration of the area with the rest of the respective countries in terms of communication as well as interaction of a political, cultural, social and economic nature, taking into account integration as a highly dynamic element of development.
- Effective territorial occupation based on models of sustainable production and in the long-run, considering the ecological reality of the Amazon and relying on the active participation of the population in the process of integrated regional development.

An explanation of the work methodology is titled "Realization of the studies" (p. 2). Although the description does not take into account the details of the work implemented in the field sites, other sections of the diagnostics contain information summarizing the procedures for the methodologies used. But this section is divided into two parts: 1) Organic structure 2) Execution of the work. The "organic structure" describes the structure of staff organization and hierarchy used for carrying out the research and the functions of each committee or participating unit in the work.

In reference to the execution of the work, the implementation of the basic studies and given the limited availability of resources, the collaboration of the sectoral entities for each country was solicited, and each country was put in charge of preparing the information. As support activities of the technical unit, the existing information on the study area was gathered, as well as information on the projects and activities in process in the region. These meetings also served to discover the diverse sectorial needs and to form the strategies between the various units of the work.

The compilation of the information included two technical meetings in Ipiales and a visit to the project area by numerous technicians from the two countries and consultants from the Regional Development Department of the OAS.

OEA, 1987. "Programa de desarrollo integral de la Amazonía Boliviana: **Macrodiagnóstico regional y estrategia de desarrollo**" ("A program of integrated development in the Bolivian Amazon: Regional Macro-diagnostic and development strategy"), Washington, D.C., 99 p., IICA- E51 O63.

This **diagnostic** would serve as an instrument for programming and planning a strategy to promote regional integration and development. The orientation of the studies has been directed towards perfecting projects at the pre-feasibility level with the basic objective of improving the socioeconomic conditions of a broad region, promoting the processes of colonization in susceptible areas and consolidating the processes of integration at the regional level as well as with the rest of Bolivia. The studies present conclusions and recommendations from the regional **diagnostic** which analyzes the potential and limitations of the region, in the process of reaching an integrated development.

The organization of the **diagnostic** is as follows.

- 1.1 Importance of the Amazonian region in the national context
- 1.2 General considerations
- 1.3 Introduction to the subregions, geographic characteristics and natural resources
- 1.4 Human settlements, polarized and nuclear areas
- 1.5 Socio-demographic aspects
- 1.6 Characteristics of infrastructure and social services
- 1.7 Regional economy
- 1.8 Principal obstacles to regional development

Although the document does not describe the methodology of the diagnostic, page 45, titled "Methodology", describes the orientation of a methodology as follows:

"The methodology of the present study is oriented towards the cataloging of problems prioritized on the basis of a survey and identification of regional needs. The list has allowed for the most outstanding characteristics to be typified and the generation of three hypothesis-problems which define the region as a whole:

- The region is vulnerable and dependent
- The region suffers from demographic isolation and low population levels
- The region lacks incentives for investing and institutional support

Based on the above considerations, the first objectives, on a national basis, were identified for the purpose of creating a methodological framework and institutional support for the strategies to develop the region. Within the national policies of integration the following objectives were selected:

- a. Sociocultural, economic and physical integration between the different regions of the country to create a modern national state.
- b. The incorporation of the Amazonian region with full participation in the national goals.
- c. The real incorporation of the country in the process of integration of the Amazon and the interconnection of the watersheds.

With a base of such important institutional support, and, therefore, the willingness of the Bolivian government to support the actions of socio-cultural, economic and institutional integration for achieving regional development, the fundamental support was oriented towards defining the strategic focus of the program.

The methodology used is deductive. In other words, it goes from the general to the particular, inferring actions and policies at the national and regional, and even microregional and local levels. The analysis and the priority of problems to address were accomplished in a systematic way, often proposing more than one possible alternative for implementation."

OLAFO, 1992. "Pautas para un plan de desarrollo sostenible en un área de uso múltiple de la Reserva de la Biosfera Maya" (Guidelines for a sustainable development plan in a multipurpose area of the Maya Biosphere Reserve), Turrialba, C.R., 52 p., CATIE- ST IT No. 199.

The purpose of this diagnostic is sustainable development of a microregion, but the description of the methodology is limited to a few maps used in the study. The diagnostic is organized as follows:

1. Introduction
2. Diagnostic of the area
 - 2.1 Biophysical characteristics
 - 2.1.1 Location
 - 2.1.2 Climate and life zones
 - 2.1.3 Physiography and hydrology
 - 2.1.4 Soils
 - 2.1.5 Land use capacity
 - 2.2 Socioeconomic characteristics
 - 2.2.1 Historical review
 - 2.2.2 Demography
 - 2.2.3 Infrastructure and services
 - 2.2.4 Institutions that operate in the area
 - 2.2.5 Land tenure
 - 2.2.6 Current land use
 - 2.3 Systems of production
 - 2.3.1 Generalities
 - 2.3.2 Agriculture
 - 2.3.3 Extractives
 - 2.4 Commercialization
3. Identification of problems
 - 3.1 Biophysical and geographic problems
 - 3.2 Socioeconomic problems
 - 3.3 Technical problems related to the systems of production
 - 3.3.1 Agricultural systems
 - 3.3.2 Extractive systems

4. Land use planning
 - 4.1 Relationship between current and potential use
 - 4.2 Land ordinance
5. Sustainable development plan
 - 5.1 Principal problems and actions for resolving them
 - 5.2 Objectives and strategies of implementation

PEREZ G., L. A., 1990. "Manejo institucionalizado hacia la sostenibilidad del uso de la tierra en cuencas hidrográficas pequeñas: La cuenca del río Tuis, Turrialba, Costa Rica" (Institutionalized management towards sustainable use of land in small watersheds: the watershed of the Tuis River, Turrialba, Costa Rica), Turrialba, C.R., CATIE, 173 p., CATIE- Thesis P438m.

Although this study is not a formal diagnostic, it includes many aspects of a diagnostic of a microregion such as the methodology, the quality of land, the development of land use to date, and the institutional situation of the area. There are also numerous tables and figures demonstrating the actual situation of the microregion.

The objective of the study is to qualify the sustainability of natural resources in the watershed in a multi-dimensional form (environmental, economic and institutional), to help increase the sustainability of land use through a strategy and a permanent structure for managing the land use in the context of regional and national planning.

Primary information is used, such as a survey using a sample of 5% of the farms, a sample of 12 institutions in the agricultural and natural resources sector, and two workshops on the analysis of problems and solutions. Information such as aerial photography to produce a map of the land use (p. 79), and secondary information for a relational scheme of the problems and the application of Rapid Appraisal for Rural Development is also utilized.

Below is an outline that describes the methodology:

1. Delimiting the theme

The main effort consists of identification and characterization of the topic and the selection of the study area, proceeding through the following steps:

- A. The focus: To define clearly the horizon of research, as well as the theoretic plan within which it is developed.
- B. The study area: A small watershed was chosen, due to its characteristics that permitted the analysis of the topic of interest.

- C. Definition of the objectives: At the topic, focus, and watershed levels.
 - D. Bibliographic review: This activity was the basis for completing the planned phases and determining the secondary information for the diagnostic on the land use in the watershed.
2. Formulation of the hypothesis
- According to the secondary information on the watershed and field work, a relational plan was elaborated to orient the structure and the research phases necessary for formulating the hypothesis of the study. The first contact with the problem of the watershed used the theoretical focus of Rapid Rural Appraisal (RRA).
3. Verification of the hypothesis
- To achieve an the optimal level of land use management, an analysis of four variables is required. They are: land; land use; user; and the state.
- 3.1 Variables on land and use
- This phase of the study consisted of evaluating the inter-relation of the secondary information, land qualities, the development of land use and adjustment of land to its uses.
- 3.2 Land users
- Chapter 6 analyzes the role of the land user and support services for production. The study on farms was accomplished using information derived from a sample survey. Following this, the principal characteristics and steps of application of this technique are described.
4. Institutional potential
- There is an interest in completing the verification of the hypothesis and relying on an information base that helps determine the strategy for watershed management. The information for completing this phase is obtained from two basic sources:
- 1) a workshop involving institutions and the community;
 - 2) an institutional survey.
5. A strategy on watershed management

SECRETARIA DE ESTADO DE AGRICULTURA –REPUBLICA DOMINICANA (SECRETARY OF AGRICULTURE– THE DOMINICAN REPUBLIC), 1983. "Estudios en las áreas silvestres de la península de Barahona e Isla Beata: Propuesta para la creación de una zona protegida (parque nacional)" ("Studies of wildland in the peninsula of Barahona and Beata Island: A Proposal for the creation of a protective zone (national park)"), Santo Domingo, D.N., 296 p., CATIE- OLAFO #50176.

This document is a diagnostic of this microregion that appears to be written with the assistance of a manual of the methodology of a microregional diagnostic for sustainable development, but with emphasis on the biophysical aspects. Every aspect of the diagnostic includes a written report by an author who is a specialist. The point of departure of these works was an agreement made between the National Parks Directorate and the Wildlife Department of the Subsecretary of Natural Resources in June 1982. This agreement foresaw a study on natural resources in this zone, which will be executed by both institutions for the purpose of establishing, on the basis of the resources obtained, the management of these resources aimed at conserving them.

Between July and October 1982, five one-week field trips were made to the zone. Another trip that concluded this cycle of studies was carried out in March 1983. In October 1982, a commission, composed of representatives of the directorates of the three institutions mentioned, made a trip to the study area to study and discuss the possibilities of providing the necessary support to protect the study area.

The content of the study is as follows:

1. Introduction
2. Generalities
 - 2.1 Study area
 - 2.2 Geographic data of the study area
 - 2.3 Climate

3. Reports

- 3.1 Botanical-Ecological Inventory and Evaluation**
- 3.2 Report on the Herpetology of the extreme south of the Barahona Peninsula. Proposal for the creation of a national park**
- 3.3 Report on Mastozoology and Herpetology of the Barahona Peninsula and Beata Island**
- 3.4 Report on the Bird life in the Barahona Peninsula and Beata Island**
- 3.5 Trip report to the Oviedo Lagoon, the Bucán de Base region and Punta Acecho in the province of Pedernales**
- 3.6 Report on the important aspects of geology in the Barahona Peninsula**
- 3.7 Report on the human impact in the Oviedo zone and the surrounding areas**

4. Conclusions and Recommendations

CHAPTER IV

EXAMPLES OF DIVERSE DIAGNOSTICS

BASTERRECHEA, M.; J.M. DEL VALLE, 1988. "Estudio diagnóstico de las cuencas hidrográficas y las acciones ejecutadas o por ejecutar en manejo de cuencas en Guatemala" ("A diagnostic study of the watersheds and activities executed or to be executed in watershed management in Guatemala"), Guatemala, Comisión Nacional Asesora para el Manejo de Cuencas Hidrográficas (CONAMCUEN), 78 p., CATIE- B325 + 62 maps.

The objectives of this work, as explained by the authors, are the following:

"The present document compiles basic biophysical, socioeconomic and institutional information on the watersheds in Guatemala and the institutional actions carried out to date. In the same document the watershed is employed as a spatial unit, recognizing their limitations and at the same time taking advantage of them. The watersheds have been grouped at a scale of 1:500,000, a level which allowed inferences on their conditions, potentials and limitations. Also, the heterogeneity of their development and the critical levels of degradation of some areas can be assessed.

The document is meant to provide an objective baseline for elaborating plans, programs and projects for research, education and development." (p. 1)

The majority of this document is devoted to a diagnosis of the current situation of the watersheds in Guatemala. Much information on each microregion has been included, but without the methodology employed for arriving at a conclusion. The only part of the work which describes the methodology incorporated is part VII, "Identificación y ubicación de eventos críticos acaecidos en Guatemala" [Identification and location of critical events through time in Guatemala]. Almost all the events are natural disasters which occurred in Guatemala. This is one aspect that is not considered in the majority of the diagnostics.

In the Central American region, the concept of "watershed management" has been developed. "Initially, it was promoted as a mechanism for the planning and rational use of water resources and more recently for natural resources within the context of sustainable development for elevating the well-being of man.

With this idea in mind, CATIE assumed and initiated the Regional Project on Watershed Management (PRMC) in 1983. The basic objective of this program is to strengthen the institutional capacity of the region in dealing with the management of the resources in watersheds. This is how a series of voids, which obstruct the promotion of watershed management as an institutionalized activity, were detected.

The lack of inter-institutional coordination, training, information and activities at all levels, is the main challenge of the project." (p. i)

CABARLE, B; BAUER, J.; PALMER, P.; SYMINGTON, M., 1992.
"The program for forest management and conservation on the
Osa Peninsula, Costa Rica", San Jose, C.R., USAID/Costa Rica,
GTZ.

This is an evaluation report of a project within a **microregion** is the result of the type of multidisciplinary diagnostic needed. Although the project was already implemented at the time of the study, the factors considered in the evaluation are very similar to those which would be included had there been little or no intervention. The following is an outline of part 1 and 2:

I. Introduction

- A. Project setting
- B. Project description
- C. Evaluation methodology
- D. Project constraints
 - 1. Social constraints
 - 2. Economic constraints
 - 3. Ecological constraints
 - 4. Legal/Political constraints

II. Findings

- A. Social sustainability
 - 1. Changes in attitudes
 - 2. Organizational development of grassroots groups
 - 3. Increased human resources development
 - 4. Increased employment
- B. Economic sustainability
 - 1. More diversified economy
 - 2. Increased incomes
- C. Ecological sustainability
 - 1. Fewer forests at risk
 - 2. Improved land use
- D. Political sustainability
 - 1. Changes in policy and economic incentives
 - 2. Increased institutional cooperation
 - 3. Changes in land tenure
- E. Institutional sustainability"

The reasons for undertaking this evaluation were to review whether the project was proceeding at an acceptable level and to identify

organizational and methodological strengths and weaknesses and how to overcome some of the weaknesses.

To measure these strengths and weaknesses, four different categories of sustainability were evaluated to be sure that progress was being made in each area. The four areas and the indicators of their impact are the following:

- *Social:*
 - "Changes in attitudes on the part of the local people towards sustainable land use practices, forest conservation, and the value of the activities of The Program for Forest Management and Conservation on the Osa Peninsula, Costa Rica (BOSCOSA) in their communities;
 - increased local organizational development;
 - increased local human resource development; and
 - increased employment."
- *Economic:*
 - "a more diversified economy; and
 - increased incomes."
- *Ecological*
 - "fewer forests at risk (of deforestation); and improved land use."
- *Political*
 - "changes in national policies and economic incentives;
 - increased institutional cooperation; and
 - changes in land tenure (i.e., more secure)."

The majority of this information was gathered by the team involved in the study through interviews, presentations and direct observations in the field.

CASTELLS, J.M., 1988. "Diagnóstico de la situación de la agroindustria en la subregión Andina" ("A Diagnostic of the situation in the agroindustry of the Andean subregion"), Bogota, Junta del Acuerdo de Cartagena, 69 p., IICA- E21 C348d.

This is an example of a diagnostic of a subregion which only contains data and information on the current situation without an explanation of the methodology. Although the focus is quite broad, the organization of the study contains some interesting features. Below is a summary:

1. Historical antecedents of the agroindustry
 - 1.1 Concepts of agroindustry
 - 1.2 The period of traditional agriculture
 - 1.3 Agroindustrial revolution
 - 1.4 External physical limitations
 - 1.5 Possibilities for agroindustrial development
2. General situation of agroindustry in the Andean group
 - 2.1 Importance of agroindustry
 - 2.2 Dimensions, growth and the structure of agroindustry
3. National integration of the food industry
4. Intra-subregional and extra-subregional commerce
5. Aspects related to national policies for agroindustry
 - 5.1 The myth of agricultural vocation
 - 5.2 Subsidies for food consumption
 - 5.3 State interventions in the agroindustry
 - 5.4 Food Security Programs
6. Technical development of the food industry and the situation in the subregion
 - 6.1 International situation
 - 6.2 Situation in the countries of the subregion
 - 6.3 Mechanisms of technical research and development

CIFUENTES A., M., 1983. "Reservas de biósfera: Clarificación de su marco conceptual y diseño y aplicación de una metodología para la planificación estratégica de un subsistema nacional" ("Biosphere Reserves: Clarification of their conceptual framework, and the design and application of a methodology for strategic planning of a national sub-system"), Turrialba, C.R., CATIE, 209 p., CATIE- 333.95 C569.

This document describes the characteristics of a diagnostic of a biosphere reserve and a proposed methodology for strategic planning of national subsystems of biosphere reserves. "The logic of this generalized methodology is the relationship of all the stages of the planning process of the proposed methodology together, since it contains five stages which must be considered in planning whatever system or subsystem of wildland areas." (p. 82)

An outline of the section which explains the proposed methodology (82-128 pp.) is as follows:

1. Outline of the methodology
2. A detailed proposed methodology
 - 2.1 Preparations
 - 2.2 Identifying the conceptual framework of the biosphere reserves
 - 2.3 Identification of the legal and national political context related to natural resources
 - 2.4 An analysis of the basic biophysical information and the national infrastructure
 - 2.5 An analysis of the national system of existing and proposed protective areas
 - 2.6 Identification of voids and superpositions in the system of the existing and proposed wildland areas
 - 2.7 Identification and selection of the potential biosphere reserves
 - 2.8 Establishment of priorities
 - 2.9 Forming a national subsystem of biosphere reserves
 - 2.10 Definition of strategies
 - 2.11 Production of a national strategic plan for biosphere reserves
 - 2.12 Evaluation and replanning
3. Application and testing of the proposed methodology

ESCUELA DE CIENCIAS AGRARIAS, UNIVERSIDAD NACIONAL, C.R. Y COOPERACION TECNICA FRANCESA (SCHOOL OF AGRICULTURAL SCIENCE. NATIONAL UNIVERSITY, C.R. AND THE FRENCH TECHNICAL COOPERATIVE), 1986. "Estudio sistémico de la realidad agraria de una microrregión de Costa Rica: Nicoya-Hojancha", ("A systematic study of the agricultural reality of a microregion of Costa Rica: Nicoya-Hojancha"), Heredia, C.R., 69 p. and 72 p., GTZ- RC E11 026 and RC E11 027.

"This series of documents includes a detailed **diagnostic** of a study area which is not only an inventory of agroecological restrictions and market possibilities, but also consists of the following objectives:

- To identify the major production systems practiced in the region.
- To understand the socioeconomic reasoning to which each major production system identified responds. There can be various reasons, such as securing self-sufficiency, distributing risks, obtaining the maximum income per hectare, maximizing returns to family labor, and maximizing return to capital.
- To show, in the framework of each of these systems of logic, the bottle-necks that the farmers must confront: work overload at a given time, lack of secure financial resources, underutilization of material, difficulties with storage and drops in fertility."

The **diagnostic** described in the study area is composed of a series of documents that are presented in the following manner:

First part: Agricultural History of the Nicoya Peninsula.

Second part: Zoning of the agroecological space according to homogenous problems.

Third part: Typology of the production systems.

The documents include detailed explanations of the **methodology** incorporated into every phase of the **diagnostic**. For example, in the third phase, "Typology of the Production Systems", the most important step in

the methodology for defining the various categories of types of production were complete surveys on the farms studied. The explanation of the aspects of those surveys is as follows:

- "Structural data of the farm: the available land and the possible use, labor, production capital and its distribution in the different items of production, etc.
- Reconstruction of all activities accomplished inside and outside the farm within the last complete annual agricultural cycle (from summer to summer, in the case of the Nicoya region).

The objectives of this reconstruction are the following:

To identify the different agricultural activities of the farm.

- To analyze the inter-relationships among the activities that refer to the limitations of labor, transfer of capital from one activity to another, etc.
- To perform an evaluation of the economic results of each activity on the one hand and the farm as a whole on the other hand, as well as the activities outside the farm that generate outside income.
- The identification of the relationships of production between the farmers in the area: selling labor, renting land and production capital, etc.
- The consideration of the historical aspect of agricultural practice: the study attempted to identify the history of the farmer and his farm with the greatest possible accuracy, especially the systems of production, but also referring to the possible radical changes in the orientation of the production of the operation. This historical element helps provide a dynamic content to the analysis of the production system." (pp. 8-9)

INGENIERIA Y GEOLOGIA S.A., 1988. "Diagnóstico del estado actual de manejo y conservación de la cuenca alta del Río Virilla: Cuenca prioritaria piloto" ("A diagnostic of the current state of management and conservation of the upper watershed of the Virilla River: priority pilot project"), Turrialba, C.R., 138 p., CATIE- OLAFO #25803.

Based on the recommendations of the National Advisory Committee, in Costa Rica, of the Regional Watershed Management Project, the upper watershed of the Virilla River (waters above its confluence with the Tibás River) was selected to diagnose and assess the current state of management and conservation.

To reach this objective and to establish an integral management plan later, it was necessary to gather all the biophysical and socioeconomic information available. In this manner, the geomorphological aspects were evaluated, as well as the hydrometeorological conditions, subterranean waters, the current use and the capacity of land use, causes of contamination, social and demographic components and productive activities.

Taking into consideration those parameters and anthropogenic or non-anthropogenic order that affects the progressive deterioration of the current state of the watershed (geological threats, instability in the hillsides, urban expansion, population density, abuse of land and environmental contamination), an order of priority was established, in which each sub-watershed has been characterized by its critical situation relative to the work being done.

Under these circumstances, the actions to be taken should be oriented toward deceleration of urban expansion, which will, at the same time, reduce contamination, erosion and deterioration of the soil, water and the environment in general.

The basic methodology of the work consisted in locating, consulting and analyzing available technical documentation with that data and information used for evaluating and developing the proposed objectives. Also, a selective compilation of unpublished data and cartographic material was carried out. The data obtained was verified and calibrated through various field visits and by employing methods of interpretation

of the information generated through remote sensing (aerial photographs, LANDSAT images, infrared photographs, etc.).

The final actions taken, considered basic for this type of research, were various group discussions carried out to exchange information and to form a general opinion on the environmental and socioeconomic situation of the area.

MUSSACK, MICHAEL, 1988. "Diagnóstico Socio-económico de los Sistemas Agroforestales de Cacao, Café y Árboles de Sombra Utilizados en la producción de Madera en la costa de Ecuador" ("A Socioeconomic **Diagnostic** of the Agroforestry Systems of Cocoa, Coffee and Shade Trees Used in Timber Production in the Coastal Area of Ecuador"), North Carolina, The SCFER Institutions- FPEI Working Paper No. 35, 99 p., GTZ- #83.

The principal objective of the Private Forestry Initiative for Development (INFORDE) is to promote the development of the timber sector in Ecuador. With this objective in mind and knowing the potential of the agroforestry systems in the coastal area as an alternative to timber supply, it was decided that a **diagnostic** of the reality and the potential in the region be carried out. In addition to presenting the current situation of the agroforestry systems, in this context, the objective of a **diagnostic** is to analyze the role of trees for generating income on farms and the potential for timber in the region, and to present the possible steps to follow in order to stimulate the use of agroforestry systems in timber production.

Page 7 presents a **methodology** used in the research in the definition of the sample area, determining the sample, designing a field survey, and collecting, processing and analyzing data.

Page 51 includes the principal obstacles to commercializing forest products, which are classified into three groups: the first group refers to the cost and prices of the marketed products; the second group refers to the quality of forest products; and the third group refers to the assistance received by small farmers in the production and management of their forest resources.

This **diagnostic** completely ignored sustainability but is presented in a very organized way and may be of benefit as a procedural example.

NAIR, P.K.R., 1989. *Agroforestry Systems in the Tropics*, The Netherlands, Kluwer Academic Publishers, 664 p., GTZ- #211.

The 25 case studies included in the book all have a short explanation of the methodology of the existing system in one way or another and are set up very similarly to a diagnostic. The factors discussed include socio-economic, socio-cultural, climatic and environmental considerations, among others.

The portion of each report which most closely resembles a diagnostic, is that each one includes an analysis of problems and assessment of potentials, or some similar section. Finally, each study area is limited to a particular microregion and the focus is usually on one particular subject or problem.

"Since agroforestry was a relatively new term when this project was initiated, the main objective of the book was to increase the understanding of, and provide a state-of-the-art information base on, existing agroforestry systems. Therefore, the project was designed to systematically collect, collate, synthesize, and disseminate information on existing agroforestry systems in developing countries. One of the major results of the project, descriptions of existing agroforestry systems forms the bulk of this book. Other products of the project include a microcomputer database on agroforestry systems, practices and components, and voluminous unpublished reports and records.

The book presents the diversity and complexity of tropical agroforestry systems. The descriptions and their analyses show their potentials on the one hand, and the obvious gaps in our understanding of these systems on the other. This points out the need to undertake systematic research efforts to fill these voids and improve the functioning of these low-input traditional systems that provide sustenance to millions of poorer sections of people in developing countries."

OEA, 1978. "Proyecto Darién: Estudio para la orientación del desarrollo integral de la región de Darién Colombiano" ("The Darién Project: A Study on the orientation of integrated development in Darién, Colombian), Medellin, Colombia, 158 p, GTZ- RC E50 018.

The first chapter of this report is titled "A diagnostic of the region". The structure of the diagnostic includes the following elements:

- 1) Physical description and location
 - 1.1) Regional borders
 - 1.2) Political-administrative extension and division
 - 1.3) Hydrology
 - 1.4) Physiography and relief (valleys, marginal valleys, inter-mountain valleys, mountains)
 - 1.5) Environmental aspects (climatology, life zones and vegetation)
- 2) Regional potential
 - 2.1) Soils
 - 2.2) Forests
 - 2.3) Other natural resources (subterranean waters, calcites, fishing, tourism)
- 3) Socioeconomic aspects
 - 3.1) Population (characteristics, size, distribution)
 - 3.2) Employment and income (economically active population, employment structure, income)
 - 3.3) Social infrastructure (health, education, housing)
- 4) Regional economy
 - 4.1) Structure of production
 - 4.2) Agricultural production (banana, plantain, cocoa, African palm, maize, other products)
 - 4.3) Livestock production (livestock, lesser species)
 - 4.4) Land tenure
 - 4.5) Secondary and tertiary sectors (industry, commerce, services)

- 5) Economic infrastructure
 - 5.1) Highways and land transportation (road system, traffic, flow of land transportation)
 - 5.2) Airports (flow of passengers)
 - 5.3) Fluvial system
 - 5.4) Maritime transportation
 - 5.5) Electric energy

- 6) Synthesis of the diagnostic
 - 6.1) Economic structure
 - 6.2) Spatial structure of the economy
 - 6.3) Socio-political structure
 - 6.4) Political-administrative structure
 - 6.5) Physical-spatial structure (urban centers, transportation system)
 - 6.6) Factors limiting development

Also, on page XXI, there is an explanation of a methodology of the study which is as follows:

To propose a global concept of that which is understood as regional development is difficult, first, because of the changes recorded in the concept of development in the last few decades and, second, because of the complexity of the regional analyses developed, which were based on the rather simplistic proposals of the 1950's.

Many of these concepts have become redundant in attempting to expand on the proposal of a more complex integration of the various lines of disciplines and in the emergence of a greater variety of foci and positions addressing the problem.

Obviously, the purpose of this document is not to discuss the subject in depth, nor, much less, to provide a definite answer to the problem. Rather, it is intended, to the extent necessary, to organize the study in Darién, to make explicit a group of ideas on the most outstanding aspects of development as assumed in the evolution of this work, and to show the way in which the work has been structured.

This study is composed of three sections. The first is a conceptual framework for regional developmental planning, which attempts to formulate questions related to the way in which the concept has been understood, the objectives and the types of actions and intervention necessary in a regional developmental process. The second section is an operative plan for regional development, which attempts to present the problem in a way that is oriented towards action. The third section, without entering into the methodology, demonstrates a way in which both previously enumerated aspects gave rise to the basic structure of studies carried out.

PROCISUR, 1985. "Tipificación y clasificación de sistemas de producción, Dialogo XIV" (Typifying and classifying systems of production, Dialogue XIV), Montevideo, Uruguay, 183 p., IICA-PROCISUR-IICA DIALOGO-14 c.1.

The work is one of the presentations of a seminar on "A diagnostic on agricultural production and typifying farms in Alto Beni, Bolivia" (p.101), which summarizes a methodology employed in the study on the diagnostic of agricultural production and typifying farms in Alto Beni, Bolivia.

The successful development of programs of generation and transfer of technology in agriculture depends on the degree of knowledge of the systems of production of a certain region, of the objectives and goals of the program, and of the methodology employed for that task.

A **methodological framework**, developed by CATIE, was used to carry out the **diagnostic** of agricultural production and typifying the farms in Alto Beni, Bolivia. Its application is recommended in areas such as Alto Beni where agricultural production is in the hands of farmers with limited resources and where the availability of basic information and resources is scarce.

The objective of the present work is to provide a concise description of a **methodological framework** employed in the study mentioned. This methodology includes four important points in developing a diagnostic of this type:

- A. **Definition on policy:** to be in agreement with the Bolivian government in all the steps of the study.
- B. **Definition of the area:** to define the study area. The project area is located between the parallels of 15°30' and 15°45' south latitude, and meridians 67°10' and 67°30' west longitude; it is composed of 250,000 hectares that form part of the province of northern and southern Yungas and Larecaja in the department of La Paz.
- C. **Regional diagnostic:** Secondary information available was compiled from libraries and state and private institutions that

work in the region reviewing technical documents. The analysis of secondary information was strengthened by visits to different areas of Alto Beni. This helped provide a general panorama of regional dynamics. The inquiry that was carried out on the basis of a preliminary survey was composed of a list of 40 guided questions for the work by surveyors. The questions were related to the following aspects:

- Size of the farm
- Land utilized
- Land cultivated
- Components of the farm (agroecosystems)
- Yield by crops and livestock components
- Forms of commercialization and domestic transformation
- Utilization of production/processing and nutrition
- Size of the family
- Use of labor
- Access to social assistance (health and education)
- Qualitative diagram of the farm

D. Formal survey: It was possible to characterize the principal items of production in the region with the information obtained from the formal survey. In fact, it was possible to quantify the limits between the types of farms and establish the relationship and functions of the components in every type of farm. The information obtained also helped to establish clearly the limits and distorting factors for future agricultural development in the region.

STREEFLAND, P.; H. AHMED; M. NAFISA; D. CH. BARMEN;
H.K. AREFEEN, 1986. *Different Ways to Support the Rural Poor*,
Amsterdam, Royal Tropical Institute, 190 p., GTZ- #46.

This book is the final report of a study of medium term effects of two development approaches, one emphasizing material support, the other non-material support. Both development approaches have the same general objective: to alleviate rural poverty. This objective is realized by way of development projects and surveying the results of two such projects, one in Sunamgani District, the other in Tangail District. In each case fieldwork took six months. The study, though it focused on two different development approaches, is not meant to be a comparative study. Each of the development approaches is important in its own way. There is a chapter on each one (p.22 and p.80). The material support approach emphasizes a supply of credit, while the non-material approach stresses awareness and education.

The methodology of the study is explained in detail, including tables showing composition and size of households in the study villages and maps with information pertinent to the study (roads, hand pumps, rice mill, orchards). During the fieldwork of data collection the research team was split up into two sub-teams; the remaining activities were carried out by the entire team. Each of the sub-teams, consisting of a male and female researcher, collected data at one of the locations. One sub-team, working in a Hindu-majority area was able to carry out the fieldwork jointly; the members of the other sub-team worked separately, with the female researcher concentrating on the women and her male colleague on the men. During the initial fieldwork phase, the two teams spent time familiarizing themselves with locations and respondents and conducting a census. During this first fieldwork phase, the researchers also collected information about history and ecology of villages and their region, and about the project activities of which they would study the effects. After samples were drawn and interview checklists were prepared, the team again went into the field, for two stints of about two months. Conducting in-depth interviews with men and women in the sample households was the core activity. Also, they continued to extend their insight into the dynamics of village society and into the particulars of past and present project intervention. For these purposes they interviewed key informants

and conducted standardized group interviews, which led to the analysis phase.

The selection of the project villages was based partly on the need to gauge effects of the influence of the project interventions. To do so, it was necessary to also select two control villages in the immediate vicinity of the project villages. Assuming that effects of ecological changes, administrative measures and other development interventions would be approximately the same in a village and its control, differences found between the situation of the poor in both villages could, with reasonable confidence, be attributed to the interventions being undertaken.

A valuable tool, which has been included as Annexure-II (p.178), is an overview of some of the methodological problems encountered in the course of the study. Some of those problems include time constraints, lack of available control villages, and disadvantages of not having the researchers live in the villages themselves, among others.

CHAPTER V

REFERENCES CONTAINING RELATED IDEAS AND CONCEPTS

ANDERSON, A.B., 1990. *Alternatives to Deforestation: Steps Toward Sustainable Use of the Amazon Rain Forest*, New York, Columbia University Press, 281 p., GTZ- #424.

The tragedy of deforestation in Amazonia as well as elsewhere in the tropics is that its costs in economic, social, cultural and aesthetic terms, far outweigh its benefits. In many cases, destruction of the region's rain forests is motivated by short-term gains rather than the long term productive capacity of the land. And, as a result, deforestation usually leaves behind landscapes that are economically, as well as ecologically, impoverished. This volume explores a number of alternatives to the above scenario, many of which are already practiced by people who live in Amazonia. The structure of the book includes case studies which begin with an abstract of the situation at hand and then many of the cases continue with explanations of the methodology of the study.

Some of the most pertinent cases include: Chapter 2, "Studies of ecosystem response to natural and anthropogenic disturbances provide guidelines for designing sustainable land-use systems in Amazonia", which has a self-explanatory title, but offers tables and graphs used in classifying and illustrating disturbances; Chapter 10, "Japanese agroforestry in Amazonia: A case study in Tomé-Açu, Brazil", takes a specific microregion and studies the effects of Japanese farming methodology, including a map of land use (p. 161) and levels of

sustainability; "The search for sustainability in Amazonian pastures", chapter 13, is a study of the need to increase the productivity of existing pastures; and finally, chapter 16, "Extractive reserves: An alternative for reconciling development and environmental conservation in Amazonia", discusses the methods of "extractive reserves"—public lands designated for the specific purpose of sustainable use of forest products such as rubber, Brazil nut, and palm heart by the resident population. The concept of extractive reserves reflects an ongoing dialogue between a traditional social group expressing its needs and scientists seeking the technical means of transforming these needs into reality.

ARCE C., A., 1989. "Priorización de las cuencas hidrográficas de Guatemala para propósitos de planificación del desarrollo" ("Prioritization of the watersheds in Guatemala for planning development"), Turrialba, C.R., CATIE, 202 p., CATIE- Thesis A668p.

This study constitutes, for Guatemala, an approximation of the identification of priorities in the larger watersheds in the country. The study also identifies alternatives for land use planning at the regional level for the purpose of maintaining the integrity of the watersheds and their ecosystems, and also identifies priorities at the regional level.

The study was carried out with the following objectives: 1) to identify the watersheds, which due to the potential resources and /or a degree of deterioration, require immediate actions for their development and management; 2) to carry out a comparative analysis between the existing regionalization in the country on the basis of the political-administrative limits and a regionalization on the basis of divisions between the major watersheds for proposing alternatives of regionalization that maintain, to the extent possible, the integrity of those watersheds.

The materials used were bibliographic and cartographic computer equipment and technical drawings, a planimeter and a curvometer.

The biophysical and socioeconomic variables that were taken into account for the study were determined through successive consultations with professional technicians and leaders or decision makers of different institutions involved with the economic planning and the use and conservation of resources in the country. To do this, the most important steps using the Delphi technique were followed without arriving at a general consensus.

The variables that would be taken into account for prioritizing were identified in the first written consultation, dated November 30, 1988, and addressed to leaders and decision makers of the different institutions related to economic planning and natural resources. From the answers obtained, a summary of the biophysical and socioeconomic variables were prepared and a second written consultation was carried out in January 1989 for ranking them.

The chapter on materials and methods includes a detailed explanation of the biophysical variables (susceptibility to water erosion, agricultural land use, potential for irrigation, surface water, forest resources, soil use, water contamination, threat of floods, protected areas, hydroelectric potential, accessibility, non-conventional energy resources, tourism resources, mining and hydrocarbon potential, seismicity and vulcanism) and socioeconomic variables (population density, state of poverty, land tenure, economic activity of the population, health index, educational index, technical assistance, credit assistance and ethnic groups).

BEETS, W.C., 1990. *Raising and Sustaining Productivity of Smallholder Farming Systems in the Tropics*, Holland, AgBé Publishing, 738 p., GTZ- #242.

Although this book was put together by only one man, it is an extremely wide-ranging treatment of the subject. The format of the book is that of an encyclopedia, touching on a very large number of subjects, but without any in-depth treatment of any particular topic. This book "has grown out of the realization that the present fragmented approach to agricultural development is primarily the result of the lack of an overview on the part of development researchers and practitioners, which in turn stems from the extreme professional specialization since the 1950's. Most disciplines —agronomy, sociology, economy, etc.— have all emphasized different aspects of development; they have tended to operate separately and have often not recognized how their intentions —the improvement of entire farming systems in more or less homogeneous areas— interrelate. The purpose of this book is to provide a coherent conceptual framework that will help professionals of different backgrounds recognize the communality of their aims.

The point of departure is farming systems —the unit of agricultural production of the world's 500 million or so tropical smallholders. Seemingly, there are a large number of farming systems: however, there are enough structural and functional similarities among them to classify and narrow them down to some seven distinct dominant systems. The classification criterion is simply that there are more similarities than differences and it is possible, and practical, to discuss a system, suitably defined as a unit or entity."

This book brings together, for the first time, most relevant knowledge on the various systems, their characteristics and operation, and changes in relation to the need and potential for raising their productivity through various development interventions.

The approach is multi-disciplinary and emphasis is placed on the interactions between agro-technical, environmental, economic, sociological, institutional, and political aspects.

The book analyzes the technical, socio-economic, cultural, and political factors involved in tropical agriculture and their influence on the diverse

fields of activities concerned with changes in agriculture leading to sustainable raised productivity within integrated systems. Special emphasis is placed on the limitations imposed by natural and financial resources and social and administrative structures. Those aspects of the agricultural production process that lend themselves to improvement are identified, and the prerequisites and mechanisms of changes discussed; with particular emphasis on the effects of land-tenure and land-use, fertilizers, irrigation, cultural practices, rational crop selection, timeliness of planting, extension programs and infrastructure. (p. IX,X)

It would be impossible to summarize the contents of this book which pertain to sustainable development of a **microregion**. It would be more relevant to explain that the text could be used as a topical reference source, with the index being the most valuable section of the book.

There is, however, one section which might merit mention. Pages 236-241 explain the **methodology** of agro-ecological zone assessment and includes a flow chart on page 237 of basic land inventories.

BURCH, W.R.; J.K. PARKER, 1992. *Social Science Applications in Asian Agroforestry*, New Dehli, Winrock International, 187 p., GTZ- #432.

The most pertinent section of this book begins on page 50, with an extremely succinct definition of **diagnostics**. "In short, the simplest understanding of **diagnostics** is the method of asking questions that compare and contrast the evidence: What is the symptom? What isn't the symptom? Where is the symptom observed? Where is it not observed? When? When not? How many? How few? After several iterations of these questions, the diagnostician has uncovered most, if not all, the objective information known about this set of symptoms. At this point, the diagnostician may pose some hypotheses that explain the observed symptoms and fit the answers to the initial questions."

Two cases where the **diagnostic** step led to testable hypotheses about the role of social and technical factors in solving some problems that include agroforestry follow on pages 50-53.

In the third section of this book (pp.59-170), the conceptual and methodological approaches of four social sciences in the development and problem solving of agroforestry are considered —social ecology, political science, economics, and anthropology. Some of the main points covered in each of these sections are as follows:

Social ecology: A wide variety of tools and methods exists to obtain information about social and agroforestry ecosystems, value orientations of local people, social structures of local groups and communities, and mechanisms by which resources are redistributed. This information can be used for description and diagnosis, for planning, and for policy development.

Political science: Public choice theory explains how and why decentralization strategies can be effective in facilitating local control over forest resources—citizens can cooperate to both conserve and utilize these resources at the local level.

Economics: The criteria for designing economically efficient agroforestry systems and projects are analyzed both from the individual farmer's perspective and from society's perspective. This method of

analysis serves to determine optimal combinations of inputs and outputs in agroforestry system design.

Anthropology: Applied anthropology, with its attention to sociocultural context and people issues and its theories, models, and methods, is a powerful tool for research and development. Also, its eclectic nature, its attention to holism, and its complementary concern with case studies gives anthropologists a remarkable breadth, depth, and sensitivity to local issues.

CAMPBELL, M.J., ed., 1990. *New Technology and Rural Development: The Social Impact*, London, Routledge, 513 p., GTZ- #20.

This is a combined study carried out in six different microregions, all in different countries. The study was developed to consist of two elements in each of the countries surveyed. Firstly, there has been a study of national policy concerning the modernization and increased productivity of agriculture as reflected in the national development plan and in other relevant policy documents. Secondly, there was a field study to study changes in attitudes and relationships in communities that have adopted mechanized tillage, with or without other appropriate agricultural technology.

To carry out the second element, the research in each country consisted of a comparative study of two villages of comparable size, culture and background, one of which has introduced mechanized farming methods for a period of five years or more and a second village that has retained its traditional methods of cultivation.

Four of the six individual country studies have included a specific explanation of the methodology used to carry out the requirements within the mutually agreed upon parameters of the study.

The four that explain their methodology are India, on page 43, Indonesia, on page 119, the Philippines, on page 355, and Thailand, on page 429. The principle differences between the different approaches have to do with the level of technology being utilized in each country and the difficulty in finding a control village which has been almost completely untouched by modern farming methods. The other significant difference is the amount of personal attention given to each interview subject by the staff of the various studies.

In all cases the family was taken as the production unit for the farm and the relationships between the family members and the impact of mechanization upon the individual family members were seen as the important issues for the study. The reports from the individual countries reflect the methodology used for investigation. In all cases questionnaires were produced as the primary basis of obtaining data. These were supplemented by official records in the areas concerned and by interviews with a range of persons who were seen to be important within

the community. Where possible, the individual members of the household were questioned in turn, but a degree of sensitivity was necessary to ensure that the community norms were not contradicted or that the questioners were not seen as invaders of family privacy. While in some instances there was a slight hostility, initially, to the work of the field researchers, in all cases relationships between the sample families and the questioners remained cordial and, indeed, in the majority of cases those questioned were happy to provide information and to be as cooperative as possible.

CAPISTRANO, L.N.; J. DURNO; I. MOELIONO, Eds., 1990. *Resource Book on Sustainable Agriculture for the Uplands*, Philippines, International Institute of Rural Reconstruction, 199 p., GTZ- #545.

Sustainable agriculture for the uplands (speaking mostly of Southeast Asia and the Pacific in this text) is a pressing concern. The uplands have been characterized as remote, highly diverse and rapidly changing. Land, people and cultures are more heterogeneous here than in the lowlands. The environment is harsher, the farming systems more vulnerable. Yet, the uplands have always been the life support system of the lowlands. Today, with deforestation, erosion and an influx of migrants searching for land, the uplands stand at a critical moment in their history. To meet the urgent needs of the uplands, strategies for agricultural development must be adaptable, flexible and sustainable. Farmers' participation at all phases of project planning, implementation and monitoring is crucial. Barriers to the sustainable development of the uplands, such as ownership of land, must be identified and addressed.

The reasons that sustainability is difficult in the uplands are given on page 12.

Some of the studies which may be of interest include:

Designing small-scale afforestation: This paper outlines the World Neighbors' direct experience with farmers in the design of small scale afforestation. It includes a short guide on how to identify sites for this type of project. (p.38).

Small-scale reforestation through sustainable agroforestry land technology: The intention of the system presented here is for families to move gradually from row cropping to fruits. (p.52).

A listing of the characteristics of an ideal regenerative agricultural system for small farmers in the humid tropics: The content of this paper is explained in the title. The list is very site-specific and does not relate effects of outside influences. (p.159).

The use of Rapid Rural Appraisal in a social forestry program: Rapid Rural Appraisal was selected because it is rapid, effective and efficient in

terms of time, labor and cost. It was not used in its pure form for this study. It was integrated with other methods such as sketch-mapping, and the use of generative themes as discussion starters. (p.164).

Increasing the participation of villagers around forest areas in the development and sustainment of the forest: This paper touches on the subject of bottom-up planning, where the farmers' participation begins the planning process and is followed by implementation and evaluation. (p.167).

CASLEY, D.J.; KRISHNA KUMAR, 1989. *The Collection, Analysis, and Use of Monitoring and Evaluation Data*, Baltimore, The Johns Hopkins University Press, 174 p., GTZ- #35.

The methods which are described in this volume emphasize qualitative data collection over quantitative for several reasons, the primary being that both verbal and nonverbal behavior are examined in order to understand the views, attitudes and perspectives of the respondents better.

The authors advocate simplicity and economy as necessary, given the limited resources of many development projects, and go on to describe the three main forms of acquiring qualitative data. One method is to conduct in-depth interviews with individual respondents. In such interviews, the interviewer gently probes the respondent, which permits them to have a conversation in which ideas flow freely. A second method is group interviews, of which there are two types, community meetings and focused group discussions. The third method, participant observation, involves direct, extensive observation of an activity, behavior or relationship. The merit of this approach is that the investigator gets an inside picture of the situation as seen by the people involved. The volume then goes on to instruct the reader in detail on several different ways to proceed with each of the three methods.

The text does not completely disregard quantitative data, however, but gives some guidelines to use in determining proper uses of larger surveys and how to integrate them into a study based on using qualitative data. The final three chapters are devoted to graphic and statistical analysis and putting that analysis into usable form for the purpose of presenting it to the user.

CODEL, Inc., 1989. "Environment and Development in Central America: Promoting Natural Resource Management in Community Based Development", New York, 64 p., GTZ- #32.

The purpose of the CODEL Environment and Development Program is to demonstrate and document the urgency, feasibility, practicality and potential of an approach to development which stresses the interdependence of human and other natural resources. This report, although short and not very detailed, attempts to demonstrate what might be useful in focusing on environmental issues in community based development by reviewing the CODEL experience in Honduras and examining it critically. The following are the objectives of the program (p. 2):

- 1) Stimulate development agencies to take the environment into account when planning projects and provide a demonstration of the kinds of activities and training appropriate for the needs identified by the agencies.
- 2) Encourage the agencies to assess their needs in relating environmental problems to project planning and implementation.
- 3) Refer the agencies to available resources regarding environmental questions in the region.
- 4) Strengthen the existing resource groups.
- 5) Encourage existing groups to continue the advocacy of concern for the environment in planning projects and generate a program toward that end.
- 6) Provide a demonstration of an environment and development program suitable for development agencies in other countries.

The report then goes on to describe and evaluate each step of the program as to its effectiveness.

DIAZ M., A., 1986. "Diagnóstico forestal del departamento de Cochabamba" ("A forestry diagnosis of the department of Cochabamba"), Cochabamba, Bolivia, Corporación Regional de Desarrollo de Cochabamba, 221 p., CATIE- 634.90984 D542.

This study, carried out in the department of Cochabamba, Bolivia, is essentially descriptive and attempts to present the main features of forestry activities in Cochabamba. The aspects contemplated include its physical environment, the productive and social sectors, and institutional aspects. According to the author, the importance of the forestry sector is related to the volumes produced and marketed; labor used; employment generated and the problems it confronts; the need for management of forest stands; and the lack of incentives for improving the forestry sector.

The relative importance of the forestry sector at the regional and national level, the behavior of the forest product markets, the process of colonization of the tropical zones, and the systematic deterioration of renewable natural resources are very important antecedents for making macro- and micro-economic decisions which tend to transform the economic and social structure of the forestry sector.

The basic elements for resolving the problem in the sector and, consequently, for the definition of the strategic objectives and policies, which allow for a quantitative and qualitative transformation, constitute the fundamental objective of the present diagnostic.

This study does not describe the methodology of a complete diagnostic extensively, but in the evaluation of forestry plantations (p. 56) there is a section on the methodology used for carrying out the evaluation of all plantations of the communities under study. Three working groups were formed, each group consisting of two forest technicians and a promoter responsible for the area where the plantation is found.

The area for the stands established was obtained by measuring their perimeter. Later this data was used to calculate the area by triangulation.

To determine the number of plants and their establishment in the stand, plots of 15x15M were randomly measured in the case of two of the

groups and 20x20M in the other, the number of samples varying according to the size of the stand.

The general measurements were carried out on sloping lands, in which the distances measured were compensated according to the angle of the slope. The instruments used were: compasses, clinometers, altimeters, metric measuring tapes and stakes. Other important data gathered was: the year of planting, the average height of the trees, the altitude of the stand, and the name of the landowner.

The analysis of this information allowed the current situation in the forestry sector at the departmental, and higher, levels to be determined and explained.

In synthesis, the forestry diagnostic for the department of Cochabamba should not only be considered as an orienting instrument at the sectorial level, but, also, as an instrument of regional character that makes possible decisions on regional development, derived from the relationships of interdependence among the productive, inter-regional and departmental sectors.

ECHEVERRIA, R.G., 1990. "Methods for diagnosing research system constraints and assessing the impact of agricultural research", The Hague, ISNAR, 282 p., IICA- A50 E19 v.1.

This volume defines a generic agricultural research system and describes some methodologies for diagnosing research system constraints. An agricultural technology system is formed by public organizations (such as research institutes and universities) and private-sector organizations (such as input companies, foundations, and farmers' associations). The methodologies proposed in this volume to diagnose research system constraints are:

Agricultural technology management (ATM): a methodology that reveals the relationships between new and existing institutions and new and existing technologies. The agents involved in this process are national research systems, public extension systems, universities, farmers, private companies and government policy-making bodies. This method is described in detail, on page 15, by Ralph W. Cummings, Jr..

The ISNAR-Rutgers agricultural technology management systems (ATMS) approach (p. 31): The ATMS framework involves three levels of analysis: system, institutional, and commodity level. The objective of the three-level analysis is to see whether hypotheses about system-level weaknesses are verified at the institute and commodity levels and to identify where interventions are best made.

The International Program for Agricultural Knowledge Systems (INTERPAKS) from the U. of Illinois (p. 55): A framework has been developed for diagnosing constraints in agricultural technology systems that includes three parts: an a priori system macro-model, a set of methodological tools, and an analysis based on flow-system models.

The systematic constraints analysis process (SCAP), from the U. of Hawaii: Takaaki Izumi defines SCAP as a process of planning based on systematic analysis of the constraints for the development of a sector, subsector, or program, and the setting of priorities for actions necessary to overcome them.

This methodology has been used successfully in planning, funding, coordinating, and managing agricultural research and development

projects in the state of Hawaii, the American-Pacific Islands, and Jordan. This methodology's procedures are described in a manner which is easy to understand and addresses on-farm and off-farm factors affecting agricultural production.

Diverse approaches: This section focuses on special cases such as sub-Saharan Africa, small developing countries, agroforestry institutes, private-sector foundations and postharvest fishery research projects.

The objective of the first paper is to define a generic agricultural research system and discuss some of the **methodologies** used to **diagnose** research system constraints. The paper highlights the main issues in diagnosing constraints to agricultural research systems that are included in the papers that form this volume. Three critical areas can be defined when examining a research system: policy, organization, and management. An effective diagnosis involves analyzing these areas in order to identify principal constraints and how to release them. The second section of the paper deals with the methodologies utilized to carry out this **diagnosis**.

FAO, 1991. "Desarrollo forestal comunitario: Un examen de diez años de actividades" ("Community forestry development: A study of ten years of activities"), Rome, GTZ- RC FAO-28.

This work summarizes the current situation in the communities studied, where there are variations in the level of community forestry development. It also includes a description of the original concept and the definition used by FAO for communal forestry development.

"The objective of this study is to put together and synthesize the lessons learned from communal forestry development in the ten years since this concept began to take shape. It is a synthesis that is focused on the principal proposed theses and conclusions, without trying to reproduce the fundamental data from the diverse projects, cases and observations that are heavily documented in the base material.

The document is composed of four parts. The first part examines why, at a certain time, there was an interest in community forest activities as well as the original formulation of the problems and perception of the needs. It also outlines the main questions that were raised in forming projects and programs. The second section summarizes what is known today about the ways the rural populations really use trees and depend on them, the consequences the diminishing or degradation of these forest resources will have on them, and the implications of this better understanding for the strategies of intervention and support. The third section also summarizes the state of current knowledge regarding the best ways to organize the rural communities for the management and use of tree resources and products. The last section recapitulates the most outstanding lessons and emphasizes their implications for improving the support that governments and international organizations provide to community forestry development." (p. vii)

FAO, 1989. "Desarrollo integral de las zonas semiáridas de América Latina y el Caribe: Aportes conceptuales y metodológicos" ("Integral development of the semi-arid zones in Latin America and the Caribbean: Conceptual and methodological contributions"), Santiago, 32 p., IICA- E51 F218d.

The objective of this document is to provide a methodological proposal for interdisciplinary work in programs and projects oriented towards integrated agricultural and rural development of the semiarid zones in the region. This proposal is based on a systematic focus, which attempts to articulate in an analytical model the distinct processes involved in the potential development of the semiarid zones. To do this, an instrument was used that facilitates planning and measuring the impact the application of new technologies in these zones could have, prioritizing the mechanisms of participation of the beneficiary population and the real and effective incorporation of the different social actors.

Chapters 2 and 3 of this report are the most important. The second chapter emphasizes the relevance that the environmental component acquires in the designing of a rural development policy for depressed agroecological environments such as the semiarid zones. Also, there is a characterization (diagnostic) of the zones with respect to the natural and social environment.

The third chapter develops methodological criteria based on a systemic focus of the application of projects in the semiarid zones, especially when they have as objectives confronting productive and socioeconomic problems with an integral focus of self-sufficiency and equilibrium with the environment. The objective in using the systematic focus is to analyze the integral behavior of the semiarid environment in its category of an open system, formed by four subsystems. The use of those subsystems in the methodology of the diagnostic is as follows:

- Economic subsystem: This is comprised of all the activities related to agricultural and non-agricultural production, mechanisms of adoption and technological diffusion, and the processes of commercialization.
- Environmental subsystem: This is comprised of a synthesis of the dynamic situation resulting from the interaction of the social and natural environments. It refers to the demographic dynamics, forms

of settlements and the potentials and productive restrictions of the natural resource base.

- **Sociocultural subsystem:** This refers to the way the human group functions in life-style and culture. Generally, human interaction consists of three dimensions: normative, which sets the common patterns and criteria for regulating actions; representation, referring to the production of concepts and symbols that provide an overall interpretation of reality; and action, which includes techniques that allow for the understanding of the environment and the forms of social organization.
- **Institutional subsystem:** This corresponds to the types of inter-relations produced between the state, non-governmental organizations and base groups. These relationships can adopt forms of sectorial policies, services and support programs.

The purpose of using this focus is to analyze the integral behavior of the semiarid environment in the region, as open systems, whose structure is formed by the combination of the concrete values established in the links between their subsystems. Therefore, the main objective is to establish a simplified model of reality in which the elements identified as relevant and connected are organized through their inter-relationships of functionality.

FAO, 1988. "Environmental guidelines for resettlement projects in the humid tropics", Rome, 167 p., GTZ- #133.

This report is the first result of an ongoing effort to provide practical advice and guidance to the specialists who formulate resettlement and other development projects, and to the environmental specialists who review these projects.

The approach of this report was to place emphasis on the identification of key factors which have a major influence on the successful formulation, design, implementation and on-going management of resettlement projects. It must be recognized that it is virtually impossible to foresee all potentially adverse impacts which may result from a resettlement project. The complexity of the factors involved is such that the only reasonable course is: (1) the early identification of significant adverse impacts, (2) the improved design of projects to avoid or reduce the adverse impacts to acceptable levels, and (3) the incorporation of mechanisms into management plans to permit adaptation of the project to deal with unforeseen adverse effects.

Checklists are provided in Chapters 4-6 (pp. 23-57) to assist project formulators in identifying the key factors applicable to resettlement projects including bio-physics, socio-economics, environmental conservation, sustainability and equity of distribution. The checklists also help the formulator to consider issues, outside their disciplines, which could be affected by their decisions.

Although the report is directed to a general audience in the humid tropics, the checklists facilitate the consideration of projects within specific microregions. The quality of information available concerning each factor to be considered is the central theme of each checklist.

The principles for environmentally sound resettlement are given as the following:

- **Sustainability:** The proposed development must be capable of being sustained by: (1) the natural resources of the intended location, (2) the abilities of the people being relocated to manage both their new environment and the proposed economic activities, and (3) the ability of local, regional and national agencies to provide the technical

support and other facilities to service the project once external development assistance is withdrawn.

- **Equity:** All the people being resettled and the local population should have equal access to the resources available within the project, including land, housing, materials, financial assistance and credit, and public services such as education and health care.
- **Conservation of natural resources and development options:** The location and design of the project should be compatible with the conservation of the ecosystem functions which generate the resources required to sustain the proposed resettlement activities. Attention should also be given to the conservation of opportunities for alternative forms of development offered by the resource systems in the proposed project location.
- **Matching people and potential settlement locations:** The proposed location of the resettlement project should have environmental characteristics similar to those of the area from which the settlers will be moved. Where the environment or the main economic activities will be different, the project design should incorporate measures to train people in the management of their new environment and in the development of the new activities.
- **Integration of activities:** Many tropical ecosystems are capable of supporting more than one activity. Attempts should be made to make use of all opportunities in the development of resettlement projects.
- **Monitoring and adaptive management:** It is generally not possible to predict all the environmental effects of a project. A monitoring program is most cost effective when key environmental factors are identified at the inception of a project and baseline information is obtained to form benchmarks with which to assess the response of the environment to establishment and subsequent management of the project.

Keeping these factors in mind during the procedural portion of the evaluation is essential to produce the optimum environmentally sound resettlement project.

FAO, 1989. "Forestry and food security", Rome, 128 p., GTZ- #120.

The focus of this document is to review the current situation concerning food security and offer opinions on what needs to be accomplished in this area. There are also suggestions for strategies and approaches to identifying and solving problems.

Chapter 4, which focuses on the socio-economic aspects of forestry and food security, compiles the results of a multitude of studies to examine forestry's contribution to household food security. It explores how households use forest and farm tree resources, under what circumstances and how these uses are changing. The main links between household security and forestry are that forest and farm tree resources serve to supplement existing food and income, fill in seasonal shortfalls of food and income as well as provide seasonally crucial agricultural inputs and help to reduce risk and lessen the impacts of drought and other emergencies.

Some of the most pertinent information is found in section 4.5, "Income and employment from forests". This section deals with small-scale processing and gathering enterprises based on forest products. Table 4.1 shows the characteristics of forest-based small-scale industries. The text goes on to explain the importance of income generated from these sources and some of the ways these rural enterprises have found to compete with their much larger commercial counterparts.

The conclusion of the section is devoted to constraints to further development of forest-based enterprises. These include insecure markets due to low rural income, raw material shortages, lack of access to appropriate technology, shortage of finance, managerial weaknesses and a lack of organization of the enterprises in a manner which enables them to make effective use of available support services. Finally, improvements in rural infrastructure which enable products from outside to be sold in rural markets also puts pressure on small enterprises.

FAO, 1987. "Forestry extension methods", Rome, 155 p., GTZ- #121.

This is basically a guidebook for determining the appropriate skills in agriculture, forestry and related activities to improve the welfare and quality of life of the remaining rural population through the practice of forestry extension. Extension is a process of integrating indigenous and derived knowledge, attitudes and skills to determine what is needed and how it can be obtained to overcome particular obstacles.

Section 3.5 gives a brief overview of the methods of extension including:

- a. Individual contacts: A most effective way of bringing about change is through individual contact in the home or the work place, or in some cases through informal contacts in markets or public places. This raises problems, however, in selecting suitable persons for such contacts, considering the limited number of people who can be contacted within a given period and the possibility that this may give rise to feelings of neglect or even of jealousy amongst some members of the community who cannot be included in the program.
- b. Group contacts: This method is designed to assist specific groups, such as farmers, producers or users of forest produce, women's or youth groups. It is becoming increasingly important as an extension procedure. Not only may information be presented or techniques demonstrated to several people who usually share a common interest, at one time, but discussion can take place, comments or suggestions can be offered by the group and questions from both sides can be asked and answered.

This situation makes learning easier and may stimulate group members to take joint action on a problem.

- c. Mass contacts: In this case contact is more tenuous. It is achieved mainly through the various means of mass communication such as printed matter, broadcasts or audio-visual presentations. The lack of direct contact makes it difficult to assess if the message has been properly received and understood by the audience and more difficult

to modify to suit any particular groups of people or areas of the country.

These methods are explained in extreme detail throughout the remainder of the text, and especially in sections 8 and 9. For example, specific guidelines are given on how to structure personal visits, whether they are conducted in the home or workplace. An intricate explanation of designing audio-visual aides is also offered.

Factors for successful implementation of an extension program are also offered, including:

- Goals some clearly defined benefits or results a particular group wishes to achieve;
- Target groups groups of people selected as the most likely to achieve particular goals which they themselves have discussed and approved, or people most in need of the benefits these would bring;
- Message the information or skills which, in conjunction with local practices and culture, would help the target groups achieve their goals;
- Methods the means by which indigenous and derived knowledge or skills can be combined and presented to the people to assist them to achieve their goals; and,
- Organization the structure set up by local people on their own or in collaboration with an extension organization to achieve their goals and to attract the assistance in personnel, material or cash that is required for their purpose.

This report is designed to be accepted as complete research of the methodology required to conduct forestry extension, not as an explanation of how the methods were determined.

FAO, 1982. "Potential population supporting capacities of lands in the developing world", Rome, 139 p. + maps, GTZ- #105.

The report describes a methodology developed for the determination of physical potential "population supporting capacities" of lands and records the results of the application of the methodology, at a 1:5 million scale, to five regions of the developing world. Three levels of inputs circumstances are used in the assessment and the potentials are compared with data on present and projected populations.

Population pressures are thus quantified and problem areas delineated where land resources are insufficient to meet food needs. Such problem areas are designated as "critical" areas and are defined in terms of their location and extent, and the magnitude of their excess population. The analysis, at its finest level of detail, is undertaken for individual-country length of growing period zones. Two time-frames are used in the study, namely the present —as represented by base year 1975 data and the future— as represented by year 2000 projected data.

The methodology developed by the project, to assess the potential population supporting capacities of lands, includes six principles which are fundamental to any sound evaluation of land:

- 1) Land suitability is only meaningful in relation to a specific use; e.g., land suited to the cultivation of cassava is not necessarily suited to the cultivation of white potato;
- 2) The evaluation of production potential is made in respect to specified levels of inputs;
- 3) Suitability refers to use on a sustained basis;
- 4) Evaluation involves comparison of more than one alternative type of land use;
- 5) Different kinds of land use are compared at least on a simple economic basis, i.e., cost-benefit analysis;

- 6) An inter-disciplinary approach is adopted, the evaluation being based on inputs from crop ecologists, agronomists, climatologists and economists, in addition to those from pedologists.

An extensive explanation of the methodology, including tables, graphs, figures and statistics, is contained in Chapter 2 (p.9). The points covered in the chapter are:

- 1) the overall model and its concepts.
- 2) the land inventory: climate, soils, and land.
- 3) land for rainfed production: non-agricultural land requirements; fallow period requirements; irrigated land requirements and production.
- 4) rained production potentials: agro-climatic suitability; soil suitability; degradation; allowances for seed requirements and waste losses.
- 5) Estimation of potential population supporting capacities: Crop choice; presently grown mixture of crops; potential population supporting capacities.

Finally, an interesting table of the methodology is presented in figure 1.1 on page 63.

FAO, 1989. "Sustainable agricultural production: Implications for international agricultural research", Rome, 131 p., GTZ- #112 .

This paper is aimed directly at agricultural development, but the summary at the beginning outlines the conceptual **methodology** which should be used to keep sustainability integrated into all aspects of research. The FAO does not view research related to sustainability as a separate or discrete activity. Rather, concern for sustainability should be reflected in the way the research is approached. That approach must consider sustainability in terms of the dynamics of population growth and resource conservation. Page 3 gives a very comprehensive definition of sustainable agriculture.

The factors which must be considered when formulating a sustainable plan include:

- Balance in research: Although productivity research includes many aspects of resource management, the strengths of the various components of the multidisciplinary approach must be kept under review at all times to ensure appropriate balance.
- Short-term and long-term objectives: If the goal of sustainable agriculture is to meet the changing needs of people, research must clearly cater to both short and long-term needs. The aim should be to devise technologies that can meet short-term requirements while, at the same time, maintaining or enhancing the ability to meet long-term needs.
- Levels of inputs: Research should be designed to optimize productivity from the use of low levels of purchased inputs.
Improved production systems: There are dangers in disregarding the principles of traditional production systems and in assuming that, because they are appropriate in some circumstances, they will be so in others.

- **Advances in biotechnology:** Techniques emerging from advances in biological science must constantly be assessed as to their possible contribution to work in sustainability and productivity.
- **Policy research:** Although many problems of sustainability do not have technological solutions, they lend themselves to policy research aimed at discovering those options most likely to favor sustainability.

FAO, 1991. "Technological options and requirements for sustainable agriculture and rural development", Rome, 141 p., GTZ- #348.

Rapid population growth normally implies increased demand for basic foodstuffs and other agricultural outputs, employment, land ownership, and higher incomes in the agricultural sector. This is very difficult to attain while conserving natural resources. In order to meet these demands sustainably, technologies must be developed and properly used to ensure efficiency of input utilization, environmental protection, and to ensure profitability while enhancing the productive capacity of the natural resource base.

This document examines technological options to make agriculture more sustainable at progressively higher levels of productivity over time. Whether a given technology is able to do this is determined by site-specific agro-ecological conditions and aspirations and possibilities of the farmers, the latter in turn conditioned by the social and economic acceptability of the technology.

Chapter 4 (p. 9) discusses technological options related to agro-ecology in different ecosystems (drylands, humid and sub-humid lowlands, irrigated and flood lands, and special ecosystems) and those options related to levels of resource endowment (areas with high potential, areas with low potential, level of external technology inputs).

Chapter 5 (p. 18) deals with the technological aspects of the future challenges to sustainable agriculture and the dilemma of choosing among technological options. A distinction is made between two inter-active types of technological options: information-based farm management techniques and material input technologies.

GLIGO, NICOLO, 1990. "Factores críticos para la sustentabilidad ambiental del desarrollo agrícola. Situación y tendencias según tipo de productores." ("Critical factors for the environmental sustainability of agricultural development. Situation and trends according to the type of farmers"), Santiago, CEPAL, 8 p., GTZ- RC P04 021.

"One of the principal conclusions of the analysis on numerous diagnostics is that agricultural development in Latin America lacks one basic element: environmental sustainability. Nevertheless, this assertion is quite inaccurate due to the lack of a definition of this concept. The first objective of this work is to define it accurately. This text analyzes five basic factors that influence environmental sustainability, in an attempt to establish their characteristics regarding capitalistic producers or farmers."

The factors are:

1. Ecological coherence: "Ecological coherence refers to the use of natural resources in the function of their suitability. Undoubtedly, the lack of coherence has been translated into the processes of non-sustainable expansion which have been caused by losses and deterioration on a large scale."
2. Socio-structural stability: "The land is currently dominated by mercantilism in which the land is much more subject to market trends than in past decades. This system is highly unstable, with the result being the deterioration of the ecosystems"
3. Infrastructural complexity: "The processes of transforming the rural environment are accomplished by the income and outgo of materials, energy and information. At the rate that the environment becomes more artificial, the established agricultural systems open and the flows become more intensified."
4. Economic-financial stability: "Given the economic framework and the types of rationality created by it, it is possible to decrease the degree of variability through measures that cushion the negative changes in profitability."

5. **Doubt and risks: "It is possible to lessen the doubt and risks through a thorough understanding of what is being done."**

"Without environmental sustainability in the long-run, the system of agriculture and rural development is at risk of collapsing. Strong modifications will be needed to prevent this and to achieve new ways of conserving resources. Nevertheless, to wait for that result signifies passing through periods of accelerated losses of resources, many of which will be irreversible.

It is necessary rapidly to transform the strategies of development in order to modify the current trends and to revert them. These strategies must be based on the functions assigned to the agricultural and rural sectors in the overall process of development, which undoubtedly will have an ecological cost. The necessary transformations will be to minimize this cost within the concept of maintaining environmental sustainability."

GOODLAND, R., 1990. *Race to Save the Tropics: Ecology & Economics for a Sustainable Future*, Washington, D.C., Island Press, 219 p., GTZ- #248.

This book shows (through a multitude of case studies of actual applied methods in a variety of microregions) what applied tropical ecology is and how it already has started to be used in improving economic development in developing countries. Applied ecology, the application of ecological principles to solving real world problems, is discussed in the introduction. The integration of applied ecology into the process of economic development has already improved it significantly and will improve it much more when such integration becomes systematic rather than the exception it is at present.

In this book, written by "front-line, muddy-footed practitioners of applied ecology", the enormous benefits to be gained and the staggering and usually irreversible losses to be prevented when ecology is applied to economic development are demonstrated. Also, ecology is applied to agricultural development (p. 33), both agroecology and agroforestry (p. 49), moist forest management (p. 59), pest management (p. 81), and to large-scale hydro and irrigation systems (p. 101), all of them in tropical developing countries. This is complemented by chapters on teaching applied ecology to nationals of tropical countries (p. 125); ecology applied to conservation (p. 161); and environmental sustainability (p. 171). This book is not a research tome. Rather, it records the attempts, many empirical and ad hoc, to apply what little is already known about applied ecology to real life development issues in tropical countries.

GORDON, J.C.; W.R. BENTLEY, 1990. *A Handbook on the Management of Agroforestry Research*, New Dehli, Winrock International, 72 p., GTZ- #433.

This book is intended to assist in managing an agroforestry research program, project or career. The major components of the research process and the differences between agriculture and forestry research are described. Because agroforestry research tends to be long-term, complex, and interdisciplinary, this book emphasizes defining problems, establishing programs, formulating research questions and hypotheses, and preparing written research plans that will serve as protocols regardless of personnel or administrative changes.

Chapters 2 and 3 both include small sections titled "diagnosis and design" (p. 16 and p. 23), which describe some guidelines for diagnosis. The concepts in Chapter 3 are especially well developed. These concepts treat the constraints and potentials of existing land-use systems and candidate agroforestry technologies in a six-step analytical sequence:

- 1) Characterize the essential features of structure and function in existing land-use systems and identify output subsystems.
- 2) Evaluate the performance of the systems, identifying problems defined by gaps between potential and actual performance.
- 3) Determine what constraints limit the performance of the subsystems—for example, land resources, investment capital, time, technologies, tenure, and information.
- 4) Identify general areas for potential interventions that will remove constraints and improve performance.
- 5) Determine constraints that modify the appropriateness of candidate technologies.
- 6) Identify remaining potentials for specific technologies that exist or could be developed.

ICRAF, 1985. "The use of economics in diagnosis and design of agroforestry systems", Nairobi, Kenya, 85 p., GTZ- RC F08 021.

In this paper, the economic aspects of the diagnosis and design system are highlighted. It is not a manual in the sense that it tells the reader what to do; rather it focuses attention on issues, methods and tools to be considered when grappling with the task of assisting in finding agroforestry solutions to existing land-use problems or to exploit existing potentials for agroforestry. Although a conscious attempt has been made to keep the wording simple in order to capture a wider audience, a basic knowledge of economics would certainly be to the advantage to the reader.

In the first section, the role of economics in the diagnosis and design process is discussed. The section looks at macro- and micro-level socio-economic information requirements as well as at the analysis of the information. It also provides a general framework for the analysis of candidate technologies proposed during the design process.

This section includes the methodology of the diagnostic process in the form of steps which must be taken in order to complete the diagnostic process.

These steps start with an environmental (biophysical and socio-economic) description and analysis of the study area, followed by an identification of farming systems. If there are many farming systems in the area, and only limited research/development funds are available, only a few systems have to be singled out for priority treatment.

The next step in the diagnostic process is to describe the selected farming systems which may include a characterization of the production objectives, resource description and a description of the system's functioning.

The next step is an analysis of the selected land management systems, resulting in functional design specifications plus constraints.

Another pertinent aspect of this section is the explanation of how to describe farming systems at the micro-level. To describe the farming systems, micro-level information is required on the farm family resources

(family size, age, labor force; management skills, education; farm size, quality; location, distance, access; disease hazards; and the farm's functioning).

A checklist on how to determine the farming system's resources as well as how resources are used has been included in Annex 1 (p. 79).

In the following section, cost-benefit analysis of AF technologies is discussed in more detail from a private and a public economic viewpoint. The theoretical issues raised are also illustrated on the basis of two examples of cost-benefit analysis, i.e. one dealing with an alley cropping system and one with fuelwood tree planting on private farms.

The final section deals with decision making in the absence of numerical data. It attempts to rationalize the choice of technologies to be researched or to be disseminated for development. The framework for the process is a tree location matrix in which tree functions, both productive and service, are matched with potential planting sites on the basis of subjective costs and benefits judgements.

INTER-AMERICAN DEVELOPMENT BANK, 1991. "Application of Environmental Procedures in the Agricultural Sector", Washington, D.C., GTZ.

This set of guidelines outlines the procedures of the I.D.B., which call for the evaluation and review of potential environmental impacts of any bank operations that may generate significant impacts. The environmental procedures apply to specific investment loans, global credit loans, sector loans and technical cooperation projects. These considerations must take into account the sustainability of each project. The procedures require that I.D.B. staff:

1. Identify potential environmental impacts at the beginning of the project cycle.
2. Classify the proposed activity according to the potential impacts according to four categories, as follows:
 - A. Beneficial to the environment.
 - B. Neutral to the environment.
 - C. Moderate potential negative environmental impacts.
 - D. Significant potential negative impacts.
3. Approve the terms of reference for environmental impact assessments prepared by the borrower.

One of the significant points undertaken in the classification process is the verification of sustainability (p.17). Where conversion of land from forest vegetation to cropland or pasture is to be financed, agroecological and specific land capability assessments at suitable scales should be done as part of a regional pre-feasibility study. This type of study should be done in policy driven lending (p.35) when policy reforms designed to stimulate production could result in non-sustainable exploitation of soil, water, forest or wildlife resources.

Also, appropriate institutional mechanisms should exist for ensuring appropriate land uses and intensity of use. Given that the burden of environmental protection in lending falls upon the implementing institutions and /or other institutions competent to address environmental

matters (p.38), an analysis of the corresponding institutional capacities will be needed.

The objectives of the analysis will be (1) to assess the weaknesses and strengths of the institutions that would be involved in implementing environmental safeguards that will be included in the loans, and (2) to identify ways to develop and maintain the needed capabilities.

LOPEZ C., L., 1991. "Marco conceptual para un desarrollo rural sostenible y equitativo" ("A conceptual framework for sustainable and equitable rural development"), Santiago, IICA, 58 p. + indexes, IICA- INVES-ET E51 L864.

The main objective of the terms of reference defined for elaborating this document was to formulate a conceptual framework for rural development which explicitly incorporates sustainability. The tasks developed for that purpose are the following:

- To carry out a historical analysis of the concepts, strategic focuses and operative models of rural development adopted and applied by the Latin American countries.
- To examine the selected national experiences in rural development, their conceptual foundations, work methods, institutional arrangements and evaluate their results. The last task was to be carried out in relation to their functional capacities for generating and distributing incomes under sustainable conditions.
- To elaborate considerations and arguments which allow for redefining the fundamental concepts, and to propose a strategic focus in order for rural development to be functional in achieving sustainable and equitable development.
- To suggest criteria for policies and for institutional planning, which a strategy of rural development could incorporate to contribute to sustainable and equitable development.

To create this document, a work method based on two propositions was adopted. The first one emerged from a retrospective analysis. This demonstrated that the conceptual foundations and conventional strategic focuses had limited scope, and generated impacts congruent with their limited conceptual base and with the operational principles which were derived from it. The second one maintained that the growth potential of a conceptually renovated, appropriately expanded and structured rural development has not been adequately valued within the overall strategy of sustainable and equitable development.

MACKINNON, D.A., 1990. "Using the Private Sector for Sustainable Forestry Development", North Carolina, FPEI Working Paper, 15 p., GTZ- RC P04 002.

One effective avenue to sustainable development of natural resources is to make forest protection and management economically attractive. The Forestry Private Enterprise Initiative (FPEI) was established on a pilot basis by the U.S. Agency for International Development. It is a small project aimed to increase income and employment through multiple uses of forests in developing countries. The concept of a public/private partnership, in both the U.S. and the host country, makes for one of the most distinctive features of this project. Specific project activities were directed at institutional strengthening, education and training, domestic market development, and the development of export trade opportunities.

Ecuador was selected as the host country to test this hypothesis. The following factors were influential in the selection process:

- 1) Forests and forest products play an important role in the national economy.
- 2) Ecuador already had strong private sector institutions, including intermediary organizations. In addition, the president of the country at the time shared a conservative, business-oriented philosophy with the president of the United States.
- 3) Excellent potential for growth existed in the economic sector.
- 4) Perhaps of greatest importance, the private sector wanted the program.

The program for Ecuador was based on three broad strategies: (1) increase the value of wood-based products, nature tourism, and other goods and services that can be sold from forests; (2) increase the earnings of private forest based activities through improved technologies and marketing; and (3) encourage direct private investment in the forestry sector by both domestic and international means at all levels, large and small.

A few of the lessons learned at this point in the project, that can be of guidance in future undertakings of this nature include the following:

- 1) The success of the field program is directly tied to having an individual in charge who is an entrepreneur, to act as both a leader and a facilitator.
- 2) The host country environment needs to be right; it must include a reasonably strong private forestry sector and one or more intermediary organizations.
- 3) The research program must be willing and able to focus on applied problems in direct support of the field program.
- 4) To facilitate and coordinate both field and research activities, a strong separate administrative function is needed to handle overall planning, organizing, reporting, and control matters.
- 5) The program should be designed up front to develop local leadership and funding after an initial 3 to 5 year period.
- 6) Interest must be shown in both the public and private sectors, by a willingness to provide a portion of the financial support and to work side-by-side to achieve mutual objectives.
- 7) A total systems approach is necessary, from the resource base itself right up through harvesting, utilization, domestic consumption, product quality and quantity and on into export opportunities where appropriate.

These efforts, consistently and patiently applied, help promote forest protection through a process of sustainable, forest-based economic development.

MADRIZ V., B.J., 1988. "Redefinición de límites de áreas protegidas: Aplicación y prueba de una metodología en el Parque Nacional Volcán Poás ("Redefining the boundaries of protected areas: Application and testing of a methodology in the Poas Volcano National Park"), Turrialba, C.R., CATIE, 187 p., CATIE- Thesis M183r.

In Costa Rica the majority of the national parks and nearby areas include private properties. Some of them are lands with productive potential and agricultural use, which puts into doubt the need for the state to purchase them. There is also doubt about whether the design of much of these protected areas is the most adequate and if the adjoining lands, that are currently unprotected, are suitable for conservation.

Therefore, there needs to be a study on what must be the optimal boundaries for these protected areas. The present study dealing with the redefining of the boundaries of the Poas Volcano National Park, was executed with this in mind. In this study, a method elaborated by Godoy (1984) was applied and tested for redefining the limits of protected forest areas. For the study area, information was obtained for a series of variables related to the physical, biological, scenic environment and human activity which provided the basis for determining the most suitable limits for the park.

The existing literature on the study area from various institutions was used to obtain information. Once missing information was identified, the necessary data was obtained through field work, interviews and consulting with persons in the other institutions and residents of the places visited.

Specific methodologies and procedures for obtaining information were used according to the variables studied. The data on geomorphology were provided by a consultant. The drainage system was obtained from an analysis of cartographic maps at scale 1:50.000 from the National Geographic Institute for the study area. Principal rivers, streams and minor tributaries were recorded. The current use of land was recorded on the basis of photographic interpretation of aerial photographs at an approximate scale of 1:20.000. Also, satellite images at an approximate scale of 1:80.000 were used as a reference. The information obtained in

this way was corroborated in field visits, making the necessary corrections.

For elaborating the registry of land tenure, different types of land ownership were taken into account, such as farms acquired by the state, farms registered with surveyed boundaries, farms with approximate boundaries, and farms that are not registered. The information was obtained through studies in various national organizations. The information was augmented with interviews of landowners and inhabitants of the areas visited.

Perceptual values referring to the landscape and tourist attraction sites in the environment of the park were obtained in a subjective way, through direct observation of the landscape. Criteria such as evident or manifested singularity, spectacularity, accessibility, vulnerability and public interest were taken into account for identifying the places of scenic value and sites with possibilities of tourism and recreation.

An integrated analysis and the weighing variables were carried out, taking as a base method the superposition of transparent maps, according to McHarg (1969). This procedure is intended to be added as an auxiliary tool of the methodology used. With this addition, it is concluded that the methodology of redefining the boundaries of the protected areas is appropriate, and provides a guide for logical and simple action in complying with the desired objective.

MARCONDES, M.A.P., 1981. "Adaptación de una metodología de evaluación económica, aplicada al Parque Nacional Cahuita, Costa Rica" ("Adaptation of a methodology of economic evaluation applied to the Cahuita National Park"), Turrialba, C.R., CATIE, 19 p., CATIE- OLAFO #50527.

The objective of this work was to adapt and apply a method for an economic evaluation of a national park.

The Cahuita National Park was studied. It is located in the Atlantic Coast of Costa Rica and is composed of 1,100 hectares of dry land and 600 hectares of marine life. The basic idea of the economic analysis of the Park is simple. It compared the benefits and costs to determine its profitability. The economic profitability of the Cahuita National Park was determined through a cost-benefit relationship, which was determined to be 1.58.

Two methods were used to calculate the benefits of the park based on visitors and their willingness to pay for recreation. The first method, based on the relationship between the indexes of visits and the costs per visit, did not present satisfactory results due to the characteristics of the data available for the calculations. In this method, the first step consists of establishing a demand curve of the visits to the park. The curve relates to the index of the visits to the park area and the costs per visit, and a curve related to the experience of total recreation. This curve allows for calculating the benefits of the use of recreation to those who make use of it, by determining the consumer surplus.

The second method was based on the time value dedicated to the visit to the park, determined by multiplying the average daily wage of the visitors by the number of visitors/day, calculating the net benefits of the recreational activity of the park.

For calculating the costs, the data from the National Park Service archive were used, and the data presented the establishment, operational and maintenance costs.

Other benefits of the park were reported, and its influence on the regional economy.

It was concluded that the **methodology** is adequate for the objectives proposed, when certain precautions are taken when collecting the data which will be used in the calculations.

MILLER, KENTON, 1980. *Planificación de Parques Nacionales para el Ecodesarrollo en Latinoamérica (National Park Planning for Ecodevelopment in Latin America)*, Spain, Foundation for Ecology and the Protection of the Environment, 500 p., CATIE- OLAFO #50512.

This book contains information and philosophy on the subject of eco-development in general, with a focus on the national parks developed in the distinguished career of the author. Not many of the terms that are used in recent literature on sustainable development are found, but the ideas and the conceptual frameworks and practices presented in this book offer alternatives for sustainable development planning.

"The book contains 12 chapters. The first chapter introduces a set of concepts for the direction and development of wildland areas, and provides alternatives for their use in eco-development. From this point of view, the growth and development of national parks in Latin America are examined. The rest of the book focuses on the national park as the type of direction for natural areas most studied and developed in Latin America as well as the rest of the world.

The fundamental principles for the national parks planning are described in chapter 3, and chapter 4 describes the existing knowledge on park planning.

The treatment of park planning is divided into three chapters: chapter 5 contains a detailed description of a method for an individual national park plan. Chapter 6 examines the planning of the national parks systems that includes the requirements of entire nations. Chapter 7 suggests a method for planning of strategic elements which actually complement the plans for individual parks and for the national parks systems. Finally, it analyzes the ability of each country to implement a program on national parks in a practical way, which will depend on the ability to search out and employ men and women capable of selecting certain objectives, create programs that will achieve those objectives, and to put plans into practice that can obtain the desired objective." (p.12)

MURPHY, J.; L.H. SPREY, 1982. *Monitoring and evaluation of agricultural change*, Wageningen, ILRI, 314 p., GTZ #9.

The book is divided into two parts. Part I describes how to organize a monitoring and evaluation unit for a particular project. This section includes information on the diagnostic portion of a project. However, a diagnostic done following this guide may develop difficulties due to the relative exclusion of the consideration of outside influences. Part II is devoted to a detailed elaboration of the methodologies of monitoring and evaluation put forth by the authors. This is not an attempt to review a variety of existing methodologies, but a tool to help the reader select a course of action appropriate to his situation. The book has been written for those who have been assigned to design a program of continuous data gathering and analysis and to supervise the implementation of that program, whether or not they have specific training in agronomy, economics or statistics.

The methodology is presented in the form of an authoritative guidebook speaking to someone with little knowledge in project design and management. The value of this approach is that it is easy to follow and implement. Each step is given, without alternatives, for everything from staff selection and training to data collection by the staff and estimates of production. However, this extremely focused methodology does not allow for later problem solving of factors which are not addressed within the text.

By concentrating on evaluation of site-specific factors such as land, labor and actual production, the text neglects some of the outside variables (environmental, political, institutional, etc.).

SARGENT, F.O.; P. LUSK; J.A. RIVERA; M. VARELA, 1991. *Rural Environmental Planning for Sustainable Communities*, Washington, D.C., Island Press, 254 p., GTZ- #265.

This book of concepts, methodologies and case studies developed using studies and fieldwork conducted within the United States "is intended as a guide for rural citizens, planning commissioners, small town and rural planners, and others seeking practical information on how to manage local resources and improve their community's quality of life. It is also designed as a manual for planning professionals, state and local government officials, agency managers, and community organizers, and as a methods text for rural planning students.

Rural Environmental Planning (REP) is a method used by citizens in small towns and rural areas to plan their own future. The area covered by rural environmental plan ranges from a village of a few hundred people to a town with a population of up to ten thousand. The area may also be defined by a geographic feature —a watershed, part of a river basin, a mountain valley, or some other place where people share an interest in the sustainable use of natural and other resources for the betterment of their community. REP assumes that the primary social value of rural people is to enhance a community's long term viability by respecting the carrying capacity of the natural environment. In REP, economic development using local resources is the foundation for guiding growth. Development should be consistent with land capacities and community goals." (p. xi)

The methodology of REP is especially dependent on the "start-up" phase (pp. 31-33), which includes the following:

- Initiation: This may result from some serious change in the community, giving someone the idea that the situation needs to be corrected or improved.
- Discussion: "All ideas for community improvement, even the best ones, need a lot of informal discussion before they can be successfully implemented."

- **Organization:** Respected members of the community, knowledgeable in the area to be improved, should step forward at this time to begin organizing the involvement of others.

Though much of the material is aimed at use in the United States and is not pertinent to developing or third world countries, the majority of the methodologies put forth features which can be useful in a variety of rural situations.

The text includes chapters on the following subjects and explanations of case studies conducted on these topics: Discovering public goals and the methods used to discover those goals (case on p. 58); inventorying the resource base and the sources of data used to gather inventory data (case on p. 75); protecting natural areas and the methods used to classify and rate the natural areas for protection (case on p. 87); planning lake basins based on land-use intensity and water quality (case on p. 107); planning river basins and analysis of flood plains (case on p. 127); planning for rural quality, recreation, and historic preservation including a scenery classification system (case on p. 144); equity and evaluation; defining and guiding the rural economy and the use of economic development models (case on p. 174); defining and planning for sustainable development with a special emphasis on human development (cases on p. 186, p. 188, p. 192, p. 194); and legal concepts and the legal framework of planning (cases on p. 227, p. 228, p. 229).

SCHRECKENBERG, K.; M. HADLEY, 1991. "Economic and ecological sustainability of tropical rainforest management", Paris, France, UNESCO, 100 p., GTZ- #207.

This report sets out proposals for a collaborative effort of research, training, demonstration and information diffusion geared at exploring the working hypothesis that economically viable and ecologically sound management of mixed tropical forests can be achieved, given the right combination of ingredients. The report is intended for the broad community of research workers and technical personnel concerned with the ecology and use of tropical forest ecosystems and landscapes. An outline of this report includes:

1. Status and use of tropical forest lands

- a. The humid tropics —a changing world
- b. Sustainability and management
- c. Values and benefits from tropical forests

2. Objectives and principles of action

- a. Objectives
- b. Overall philosophy and orientation
- c. Time and space scales
- d. Technologies, techniques and tools
- e. Diversity of scientific research designs
- f. Critical mass of effort
- g. Seeking new partnerships with the private sector
- h. Modelling

3. Step-by-step methodological approach

Although the hope of this work is to integrate a variety of research projects into a compatible body of work for the benefit of rainforests in general, demonstrating ways of using tropical rainforests that are both ecologically and socially sustainable and at the same time are also economically viable, is necessarily site specific to a great extent.

- a. Research site selection
- b. Surveys and evaluation

Including sustainability. This heading would bring together any potential and actual constraints to sustainable development and their long-term trends, including ecological stress, degradation, population pressure, poaching, etc., and would allow for prioritization of research and development activities. The evaluation of current land use will demonstrate elements which are suspected of being not sustainable, on which current trends suggest crisis points will arise in the future or where current use is well below potential.

- c. Identification of alternative land uses
 - d. Evaluation of alternative land use patterns in relation to natural resources and socio-economic conditions
 - e. Recommended land uses in relation to the varying resources and socio-economic conditions
4. Research components for sustainable rainforest management
- a. Ecosystem processes
 - b. Socio-economic factors
 - c. Designing sustainable wood harvesting systems from tropical rainforest
 - d. Non-wood forest products
 - e. Rehabilitation of degraded forest lands
5. Organization
- a. Time frame and research arrangements
 - b. Contributing field projects
 - c. Funding and servicing
 - d. Methodological development and synthesis

Examples of some suggested future methodologies which could be implemented are: rain forest modelling (small controlled areas with as many attributes of a large rain forest as possible); or a rain forest information system (components of which would include gradient-based inventory procedures, geographic information systems and a core set of plant functional attributes).

- e. Building up institutional capacities and training
- f. Institutional context

TORRES, J.S., 1992. "Extensión agroforestal del Programa Forestal-Sucumbios" (Agroforestry extension of the Sucumbio Forestry Program), Ecuador, PROFORS, 36 p., GTZ- #874.

The project originated from an idea of confronting the problem caused by the colonization process that destroys the forests and ruins the ecological balance of native forest zones in eastern Ecuador.

From there, a higher objective of the project establishes the need to form, plan and carry out a policy on land use that is ecologically admissible in the long-run for the Ecuadorian Amazon. As a consequence, the project's objectives are oriented toward creating technical, professional and institutional conditions for integrating a land use plan for the province of Sucumbíos, with the protection and sustainable use of forest resources.

The first three chapters consist of a diagnostic of the region. The following is an outline of these chapters:

1. Brief presentation of the Sucumbíos Forestry Program
 - 1.1 Information on the Sucumbíos Province
 - 1.1.1 Basic data
 - 1.1.2 Soils
 - 1.1.3 Principal sources of income of the population
2. Environmental problems in Sucumbíos
3. Systems of agricultural production in Sucumbíos
 - 3.1 Description of the agroforestry systems
 - 3.1.1 Migratory agriculture
 - 3.1.2 Multi-strata or associated crops
 - 3.1.3 Home gardens
 - 3.1.4 Silvopastoral systems
 - 3.1.5 Live fences

VOSTI, S.A.; T. REARDON, W. VON URFF, 1991. "Agricultural sustainability, growth, and poverty alleviation: Issues and policies", Feldafing, German Foundation for International Development, 518 p., GTZ- #591.

"The conference was designed to add operational vigor to the sustainability issue, and to provide zone-specific, comprehensive reviews of not only how growth could affect sustainability, and how poverty could affect sustainability, but also how sustainability, in turn, could affect each of these.

This volume provides an overview of the objectives and the structure of the conference, draft copies of all conference papers and discussants' comments, and detailed conclusions derived from presented papers, discussants' comments, and open discussions from plenary and parallel sessions." (p. x-xi)

Every paper of this compilation from an International Food Policy Research Institute (IFPRI) conference includes aspects which apply to the development of a coherent sustainable agricultural system; therefore, an outline follows:

- 1) Introduction
 - A. Definitions and interrelationships among agricultural sustainability, growth and poverty alleviation
- 2) Sustainable growth in agricultural production: Poetry, policy and science
- 3) Environmental consequences of agricultural growth
- 4) The links between sustainable agricultural growth and poverty
- 5) The links between agricultural growth, environmental degradation, and nutrition and health
 - B. Effects of policy on, and options for, agricultural sustainability, growth, and poverty alleviation
- 6) The relationship between trade and environment, with special reference to agriculture

- 7) International development assistance for sustainable agricultural growth
- 8) Long-run global change: implications for agricultural sustainability
- 9) Macroeconomic and sectoral policies, natural resources, and sustainable agricultural growth
- 10) Policy impacts on sustainability and productivity investments and land use in developing countries
- 11) Accelerated resource degradation by third world agriculture: created in the commons, in the West or in bed?
- 12) Institutions and technological change
C. Agricultural sustainability, growth, and poverty alleviation: conditions for their compatibility in the humid and sub-humid tropics
- 13) Agricultural growth and sustainability: conditions for their compatibility in the humid and sub-humid tropics of Africa
- 14) Agricultural growth and the environment: conditions for their compatibility in Asia's humid tropics
- 15) Agricultural growth and sustainability: conditions for their compatibility in the humid and sub-humid tropics of South America
D. Agricultural sustainability, growth, and poverty alleviation: Conditions for their compatibility in the semi-arid tropics: pastoral and non-pastoral foci
E. Agricultural sustainability, growth and poverty alleviation: conditions for their compatibility in the tropical highlands

WINPENNY, J.T., 1991. *Values for the Environment: A guide to economic appraisal*, London, Overseas Development Institute, 277 p., GTZ- #67.

This book is a fairly detailed overview of all the factors which must be taken into account when an economist undertakes the task of valuing the environment. An outline of the book is as follows:

- 1) Why value the environment: Definitions and concepts; sustainable development and environmental capital; implications of sustainability for development projects; national resource accounting; the importance of valuing the environment; a brief User Guide.
- 2) Environmental problems in major habitats: The aquatic environment; watersheds; tropical rain forests; drylands; irrigated lowland farming areas; wetlands; wildlands; and industrial and urban concentrations.

Chapter 3 is especially interesting because it is an explanation of methods and problems with different methods.

- 3) The techniques of economic valuation: Cost-benefit analysis; cost-effectiveness analysis; environmental benefit estimators (effect on production, preventive expenditure and replacement cost, human capital, hedonic methods, travel cost, contingent valuation, and the relative usefulness of different valuation methods); methodological problems and issues (distribution of costs and benefits, discounting, future generations, irreversible effects, uncertainty and risk); conclusions on methodology.
- 4) Economic valuation in practice: Soil erosion (siltation and deposition); loss of tropical rainforest; desertification; destruction of wetlands; depletion of fishing grounds; air and water pollution; noise; marine pollution and reef destruction; soil salinisation, contamination and groundwater problems; health problems in irrigated areas; loss of biodiversity; global climatic effects:
- 5) Appraising projects: Appraisal in a decision-making framework; natural resources (agriculture, agroforestry, fisheries, livestock, nature conservation); economic infrastructure (power and energy, roads and railways, ports, harbors, coastal structures, airports); the urban environment and social infrastructure (urban projects, housing, water

supply, sewage and sanitation); manufacturing and processing industry; mining and extractive industry; tourism.

- 6) Policy appraisal and adjustment: The limits of policy; policy options; targeted economic instruments; indirect economic measures; structural adjustment and the environment; policies in a sectoral context (marine environments, watersheds, forests, drylands, irrigated areas, wetlands, industrial and urban conurbations); Conclusion-the choice of policy mix in developing countries.

YOUNG, A., 1985. "Land evaluation and agroforestry diagnosis and design: towards a reconciliation of procedures", CATIE-INFORAT "Soil-Survey-and-Land-Evaluation", 5:3 pp. 61-76.

Land evaluation is a method for identifying the best system of improved land use, of any kind, for given sites. Diagnosis and design has essentially the same aim, but is used specifically for land use systems which include agroforestry. The two sets of procedures contain many activities in common. Land evaluation is stronger in treatment of environmental aspects; diagnosis and design in treatment of social aspects. Land evaluation could benefit through inclusion of procedures from diagnosis and design in the following respects: 1) the **diagnosis** of problems of existing land use systems; 2) in some circumstances, the central steps of the **diagnosis** and design procedures could be employed as a means for formulation of improved land utilization types (not necessarily only for agroforestry); and 3) the inclusion of a research loop, for improvement of proposed land utilization types and testing of their performance. **Diagnosis** and design could benefit from: 1) a more specific differentiation into land units followed by an activity of site selection; and 2) the inclusion of a stage of evaluation, leading to suitability classification. Diagrams are given showing how these changes fit into existing procedures.

YOUNG, M.D., 1991. *Towards Sustainable Agricultural Development*, London, Bellhaven Press, 346 p., GTZ- #259.

This book contains a collection of studies concerning some of the obstacles to reaching sustainable development. Growing awareness and concern about the linkages between agricultural policies and practices and specific environmental problems, some of them with serious long-term implications, have focused increasing attention on the interface between agriculture and environment.

The principle areas of concern leading governments to re-examine the interrelationship between agricultural and environmental policies tend to fall into five broad categories:

- 1) The problems of pollution and environmental degradation associated with intensive crop production
- 2) The post-war trend, especially in Europe, towards intensive animal husbandry, creating its own particular environmental problems associated with animal wastes
- 3) The downstream effects and lost production from soil erosion caused by extensive agricultural practices associated with dryland agriculture
- 4) The changing demands and practices that have significantly altered the character of the landscapes which is leading to the development of programs to encourage farmers to save dwindling natural habitat and wilderness areas for the benefit of present and future generations
- 5) The impact on agriculture of pollution from other sources and non-agricultural activities

The methodology of each study in the book (p. 2) begins with a description of the environmental, economic and social costs and benefits of the relevant agricultural policies and practices. Then attention is given to a set of policy issues, including the effects of subsidies on inputs, the need to improve advisory services and the impact of production support measures on landscape amenity. The results of this examination are then compared with policy alternatives and practices which could result in a better integration of agricultural and environmental considerations. Each study involved the following four steps:

- 1) The identification of the benefits and impacts which arise from different agricultural practices within the policy area
- 2) The identification of the socio-economic, administrative and physical conditions which cause these impacts or which are necessary to derive these benefits
- 3) An evaluation of the effectiveness of policy instruments which seek to enhance benefits and mitigate negative impacts
- 4) The identification of the necessary conditions for and approaches to the successful implementation of policies which achieve better integration

INDEX 1

WHO TO CONTACT FOR FURTHER INFORMATION

This is a list of governmental and non-governmental organizations and institutions involved in sustainable development, each of which has been contacted by the authors. For answers to a variety of questions, and access to innumerable books, documents, data bases, and other materials, all of the following have been very helpful.

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National Agricultural Library
Beltsville, MD 20705, U.S.A.
Ph. (301) 504-5479

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Chevy Chase, MD 20815, U.S.A.

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INDEX II

METHODOLOGY OF A MICROREGIONAL DIAGNOSTIC FOR SUSTAINABLE DEVELOPMENT

SUPPLEMENTARY BIBLIOGRAPHY

Abedin, Z.; A. Quddus, 1990. "Household fuel availability and homegardens in selected locations of Bangladesh", Bangladesh, Forestry/Fuelwood Research and Development Progreect, 76 p., GTZ- #258.

The need, and the advantages, of investigating homestead fuelwood resources and uses in an interrelated manner has been apparent for some time. This study provides an excellent example of a methodology for doing so, and serves as an example for similar studies to be initiated elsewhere.

Altieri, M.A., 1987. *Agroecology: The Scientific Basis Of Alternative Agriculture*, Boulder, CO, Westview, 227 p., GTZ- #425.

This work includes a very detailed description of the term "agricultural ecology", defined as any approach to farming that attempts to provide sustained yields through the use of ecologically sound management technologies. Part Two suggests a methodology for

evaluating farming systems for the purpose of designing technologies adapted to needs and resources.

Alvim, P. "Appropriate technology for agriculture in the humid tropics", 1989, CATIE- "Agrotropica" 1:1 pp. 5-26.

This paper aims to identify production systems without harmful environmental effects (sustainable). The systems have been selected on the basis of their relative economic advantages and are presented in 4 groups in the following order of preference: a) perennial crops b) ranching c) forestry and d) temporary crops.

Applegate, G.B. and D.A. Gilmour, 1986. "Operational experiences in forest management development in the hills of Nepal", Nepal, International Centre for Integrated Mountain Development, 40 p., GTZ- #313.

The section on pages 13-17, titled "Problems to be overcome by NAFP", is a list of the "symptoms" which one normally finds in a diagnostic. The study areas are concentrated in two microregions in the middle hills of Nepal.

Araya N., W., 1985. "Metodologías para confeccionar diagnósticos de educación ambiental y planificar centros afines: Dos casos de estudio en Costa Rica" ("Methodologies for developing diagnostics and planning centers for environmental education: Two case studies in Costa Rica"), CATIE, 156 p., CATIE- Thesis A663m.

The document covers several methodologies for the development of diagnostics of the environmental educational situation in small countries or geographic regions with centralized governments.

Argüelles S., L.A., 1991. "Plan de manejo forestal del bosque tropical de la empresa ejidal Nohbec" ("Forest management plan for the tropical forest owned by the local business, Nohbec", Chapingo, Mexico, 60 p., GTZ.

This study includes a description of a methodology for determining a microregional forest management plan. The need to incorporate sustainability into the management plan is taken into account.

Avery, M.E.,...*et al.*, 1991. *Biophysical Research for Asian Agroforestry*, Arlington, VA, Winrock International, 292 p., GTZ- #434.

The book includes chapters on designing experiments for agroforestry research (p.3) and the various elements of designing agroforestry systems. The book is obviously directed to the biological aspects and just touches on the sociological concerns.

Bajracharya, Deepak, 1986. "Decentralised energy planning and management: For the Hindu Kush-Himalaya", Nepal, GTZ- #735.

This paper contains a diagnostic, although it is not called as such, on pages 17-29. The mountain region is surveyed in the diagnostic to determine sustainable solutions to increasing need for decentralized energy sources in rural areas.

Bello, E; X. Soto, 1988. "Ejercicio de mapeo computarizado para la zonificación de las áreas silvestres protegidas en la República de Costa Rica" ("Computerized mapping exercise for the zonification of protected forest areas in the Republic of Costa Rica"), San José, Costa Rica, CATIE, 34 p., CATIE- OLAFO #50588.

The use of a Geographic Information System (GIS) with the ability to collect, integrate, generate and analyze information concerning the distribution and principal characteristics of a protected area will result in a clear definition and a better understanding of the major problems and

opportunities which these zones present. This helps to establish management, investigation and development priorities.

Bormann, F. H; S.R. Kellert, 1991. *Ecology, Economics, Ethics: The Broken Circle*, New Haven, CT, Yale University Press, 233 p., GTZ- #257.

Chapter 4 of this book is a paper titled, "Nature as the Measure for a Sustainable Agriculture" (p. 43). The goal of the author is to point out the need for harmony between the human economy and "nature's economy" that will preserve both. The approach of the author is to address the problem of agriculture, rather than the problems *in* agriculture.

Brenes C., C., 1989. "Criterios para evaluar la factibilidad y relevancia de políticas de extensión rural" (Criteria for the evaluation of the relevancy and feasibility of rural extension policies"), Cartago, C.R., Instituto Tecnológico de Costa Rica, 12 p., GTZ- #146.

The document is a tool which attempts to allow a systematic and methodical evaluation of rural extension policies. The emphasis is on the identification, through an integrated focus, of the principal criteria which should be considered to stimulate rural development.

Budowski, G., 1988. "Rendimiento sostenido en bosques tropicales húmedos en américa latina" ("Sustainable yields in Latin American humid tropical forests"), San José, Costa Rica, Universidad para la Paz, 9 p., GTZ- RC P04 011.

The most interesting idea developed in this document is the discovery that secondary forests can be a much more sustainable system than primary forests. There are examples from various studies which back up this idea.

CIAT. "Amazonia: Agriculture and Land Use Research", 1982, Cali, Colombia, GTZ- #20.

This is a compilation of papers from an international conference which presented the results of several studies relating to the status of agricultural development in the countries sharing the Amazon basin.

Carr, M., 1984. *Blacksmith, Baker, Roofing-sheet maker...: Employment for rural women in developing countries*, London, IT Publications, 144 p., GTZ- #306.

This book is aimed at finding optional ways for women to earn income and presents a multitude of case studies where women are successfully engaged in non-traditional earning activities. Most of these programs have sustainability as a main goal.

Carr, M., 1989. *The Barefoot Book: Economically appropriate services for the rural poor*, London, IT Publications, 97 p., GTZ- #772.

Chapter 5 deals with the explanation and initial results of two projects designed to improve the socioeconomic status of a control group in each region by promoting measures to ensure more active participation of the rural population and facilitate better utilization of the actual and potential resources available.

Carter, M.R.; D. Kanel, 1985. "Collective rice production in Finca Bermúdez: Institutional performance and evolution in the Dominican agrarian reform sector", Madison, WI, Land Tenure Center, 41 p., GTZ- #221.

This paper describes the implementation and adaptation of a collective rice farming (colectivo) model on a particular farm in the Dominican Republic. The paper aims to discover problems and weaknesses with this particular methodology.

Centro de Estudios Ambientales y Políticas, 1992. "Análisis de Capacidad de Carga para Visitación en las Areas Silvestres de Costa Rica" ("Analysis of tourism capacity in forested areas of Costa Rica"), San José, Costa Rica, 104 p., CATIE- OLAFO #50938.

This paper analyzes the eco-tourism capacity of several forested microregiones. It makes recommendations of limits on the number of tourists and the level of tourism development which could be sustainable. The evaluations include environmental, physical, and ecological factors.

Centro Científico Tropical, 1991. "Análisis de los incentivos y desincentivos para la reforestación y el manejo del bosque natural en Costa Rica" ("Analysis of the incentives and disincentives for reforestation and primary forest management in Costa Rica") San José, Costa Rica, 150 p., CATIE-634.956097286 A532.

This work analyzes the 13-year incentive program of reforestation in Costa Rica. The most interesting part of the study is the analysis of a parallel system of disincentives that limit, diminish and block the effective and efficient application of the incentives.

Child, R.D., et al. 1984. *Arid and Semiarid Lands: Sustainable use and management in developing countries*, Morrilton, AK, Winrock International, 208 p., GTZ- #51.

An overview of what has been learned about the ecological use and management of developing-country rangeland resources and a documentation of the need for an integrated approach to the development of resources including human, animal and institutional.

Cifuentes, Miguel, *et al.* 1990, "Capacidad de carga turística de la reserva biológica Carara" (Tourism capacity of the Carara Biological Reserve), Turrialba, Costa Rica, 52 p., CATIE-OLAFO #50761.

This diagnostic of the tourism capacity of a microregion includes the methodology used to determine the capacity. Table 5 (p. 28) shows the variables used to determine that capacity.

Clark, J., 1991. "Participatory technology development in agroforestry: methods from a pilot project in Zimbabwe", CATIE- INFORAT #30971 pp. 217-228.

The main objective of the project is to investigate a range of options to solve problems of woodland depletion faced by small-scale farmers. The starting point for trial design was a diagnostic exercise involving elements of diagnosis and design (D&D) and Rapid Rural Appraisal (RRA) techniques. This paper describes the first two years of on-farm experimentation.

Clayton, E., 1983. *Agriculture, Poverty & Freedom in Developing Countries*, London, The MacMillan Press, 277 p., GTZ- #2.

This work sees availability of resources as pertaining to their allocation, specifically labor vs. land and the optimum application of labor hours per acre for various crops. Although there is extensive compilation of information and tables, no explanation of methodology is provided.

Concepción C., M., *et al.* 1992. "Population growth, poverty, and environmental stress: Frontier Migration in the Philippines and Costa Rica", GTZ- #827.

The value of this paper may lie in the fact that it is made up of two case studies which take into account several of the factors of sustainability including population density, deforestation and the economic environment.

Costa Rica, Ministerio de Recursos Naturales, Energía y Minas, 1988. "Estrategia de conservación para el desarrollo sostenible de Costa Rica" ("Conservation strategy for the sustainable development of Costa Rica"), San José, Costa Rica, 162 p., GTZ.

The reason for mentioning this document is the large number of subjects included relating to the theme of sustainable development, and the sectorial environmental evaluation with respect to sustainable development.

Dallmeier, F., 1992. "Long-term monitoring of biological diversity in tropical forest areas: Methods for establishment and inventory of permanent plots", GTZ.

This digest describes methods for establishing and maintaining permanent inventory plots in tropical forests, with emphasis on sites designated as biosphere reserves. Underlying aims are to facilitate the documented inventory of plant diversity and to provide long-term data on the growth, mortality, regeneration, and dynamics of forest trees. As such, the approach and methods set out in this digest are intended to support the development of an information base for research and education that will contribute to the conservation and management of biosphere reserves and other protected areas and to the monitoring of long-term environmental change.

Daly, H.E., 1991. *Steady-State Economics*, Washington, D.C., Island Press, 297 p., GTZ- #263.

Chapter 13, "Sustainable development: From concept and theory toward operational principles" (p. 241) focuses on the idea that economics must be reworked to focus on an optimal, or at least sustainable, level, as opposed to the maximum level. It is a very technical discussion, full of economic jargon.

de Graaff, J., 1993. *Soil Conservation and Sustainable Land Use*, The Netherlands, Royal Tropical Institute, 191 p., GTZ- #230.

Chapter 5 of this book deals with quantifying natural resource utilization. One of the subheadings, "assessing sustainability" (p.114), suggests ways to incorporate sustainability into economic analysis based on efficiency criteria.

Dixon, C., 1990. *Rural Development in the Third World*, London, Routledge, 123 p., GTZ- #48.

Chapter 4 deals with explanations and solutions of rural poverty, with attention to environmental, ecological, socio-economic and political factors. The other main cause and solution of rural poverty centers on resource distribution which is discussed in Ch. 5.

Dixon, J.A., et al. 1989. *The Economics of Dryland Management*, London, Earthscan Publications, 302 p., GTZ #28.

An overall look at dryland analysis and development including dryland characteristics and the degradation process; the role of public policy; economic principles and analysis; managing drylands as renewable resources; appraisal of investments; valuation of effects; models for dryland development planning; and implementation of policies, programs and projects.

Engel, J. R; J.G. Engel, 1990. *Ethics of Environment and Development: Global Challenge and International Response*, London, Bellhaven Press, 264 p., GTZ- #41.

A collection of extremely philosophical papers with a common theme: that of having a very "pure" view of sustainable development, in the sense that any depletion of resources or species eliminates the possibility of the development is being sustainable.

Erdelen, W., 1989. *Tropical Ecosystems: Systems Characteristics, Utilization Patterns, and Conservation Issues*, Müllerbader, Germany, Verlag Josef Margraf, 202 p., GTZ- #704.

These papers, presented at a symposium, are a bit technical and deal mostly with very narrow subjects; however, each study was conducted within a particular microregion. More importantly, the structure of the presentation of each study includes an abstract, the introduction, a description of the study area and the methodology.

FAO, 1986. "Forest extension organization", Rome, 202 p., GTZ- #246.

Chapter 4 (p. 31) lists some methods of extension. This publication attempts to give a brief outline of methods. A review of these methods may reiterate the type of questions which need to be asked in a diagnostic of a microregion.

FAO, 1984. "Planificación del desarrollo forestal" ("Forest development planning"), Rome, 200 p., GTZ- RC FAO 17.

This document examines methods for perfecting the analysis of the forest sectors of developing countries. The results show that primary importance should be placed on the recognition of the connections between the forest sector and other relevant sectors.

FAO, 1988. "Potencialidades del desarrollo agrícola y rural en América Latina y el Caribe: Plan de acción" ("The potential of agricultural and rural development in Latin America and the Caribbean: Action plan"), Rome, 20 p., GTZ- RC FAO 27.

This summary contains the conclusions regarding policy from two years of studies concerning this subject, completed by the F.A.O., in the member countries of the organization. The conclusions don't appear to consider the sustainability of development.

FAO, 1985. "Preparing agricultural investment projects", Rome, 50 p., GTZ- #256.

These guidelines aim to identify the elements common to most agricultural development projects, and to suggest how these might be treated in the course of project preparation to ensure that thorough coverage is given to all matters normally taken into account by financing institutions in their appraisal of projects.

Garton, Edward O., 1984. "Cost-efficient baseline inventories of research natural areas", Missoula, MT, USA, Symposium on Research Natural Areas: Baseline Monitoring and Management, pp. 40-45, CATIE- OLAFO #50564.

This paper attempts to define a methodology for gathering information for baseline inventories using a systematic team approach, a careful definition of objectives, and a continuous effort to simplify all aspects of the work. It also provides a checklist of procedures for accomplishing the inventory.

Gradwohl, J; R. Greenberg, 1988. *Saving the Tropical Forests*, London, Earthscan Publications, 207 p., GTZ- #30.

This work comprises a compilation and summary of case studies in four principal areas: forest reserves; sustainable agriculture; natural forest management; and tropical forest restoration. Each section of short, two-page descriptions of cases is introduced with a general overview of the topic.

Hannaway, D.B., 1983. "Foothills for food and forests", Beaverton, OR, Timber Press, 383 p., GTZ- #68.

This compilation of papers is aimed at showing that the integrated development of foothill lands for grazing and forestry represents the greatest opportunity for increasing production of both food and fiber in the world, a prospect that is enhanced by its lack of competition with present productive land use.

Hart, R.D.; M.W. Sands. "The role of livestock in the design of sustainable land use systems", GTZ- RC P01 0006.

Although many environmentalists are convinced that a sustainable livestock system is an oxymoron, this study contends that with more research livestock production systems can be improved into sustainable systems, offering strategies for making systems more sustainable.

Heaton, G., 1991. "Transforming technology: An agenda for environmentally sustainable growth in the 21st century", Washington, D.C., World Resources Institute, 39 p., GTZ- #278.

This report recommends ways to address the issue of reconciling the economic and environmental goals societies have set for themselves through a transformation in technology—a shift, perhaps unprecedented in scope and pace, to new technologies that dramatically reduce environmental impact per unit of prosperity.

Hirschhorn, J.S.; K.U. Oldenburg, 1991. *Prosperity Without Pollution: The Prevention Strategy for Industry and Consumers*, New York, Van Nostrand Reinhold, 386 p., GTZ- #254.

The main idea of this book is that the only way to correct environmental problems and sustainability is through pollution control. On page 66, the author uses the Dutch government as an example of policymaking which is effective in achieving sustainability through pollution control.

Hitz, Wendy G., 1991. "Diagnóstico sobre el desarrollo turístico de las playas en Costa Rica: El caso de Santa Cruz, Guanacaste" (Diagnostic of tourism development of the beaches of Costa Rica: The case of Santa Cruz, Guanacaste"), Asociación Costarricense para la Conservación de la Naturaleza, 63 p., CATIE- OLAFO #50787.

This work is based on a diagnostic of tourism development between the Ostional and Playa Grande beaches in the county of Guanacaste. It

includes details of the problems found in the microregion and a description of the situation regarding tourism development in the zone.

Houseal, Brian L., 1979. "Manual para la planificación y diseño de los parques nacionales" ("Planning and design manual for national parks"), Santiago, Chile, 191 p., CATIE- OLAFA #50573.

The first 4 chapters of this document make up a guide for the preparation of a diagnostic to be used in the design of national parks, including the development plan, site analysis, conceptual design and environmental impacts.

IBSRAM Proceedings No. 2, 1985. "Management of Acid Tropical Soils for Sustainable Agriculture", Bangkok, 299 p., GTZ- #329.

One of the papers in this volume, entitled "Surface Soil Degradation and Management Strategies for Sustained Productivity in the Tropics", reviews the processes and consequences of surface soil degradation of soils in the tropics and suggests management strategies for maintaining a sustained yield.

IBSRAM Proceedings No. 6, 1987. "Management of Vertisols under Semi-Arid Conditions", Bangkok, 344 p., GTZ- #331.

A description of the methods (pp. 54-58) used in determining a diagnosis for improved soil management on Vertisols in particular areas of Africa and Southeast Asia with tables showing the summary of the methods analyzed.

IBSRAM Proceedings No. 8, 1989. "Soil Management and Smallholder Development in the Pacific Islands", Bangkok, 304 p., GTZ- #327.

Two papers in this report may be of interest. On page 37, the title is "Agroforestry for sustainability on steeplands", consisting of a general philosophy of the subject and suggestions for problem solving. Page 59,

"Adaptive research on sustainable cropping systems", is structured in the same manner.

Laarman, J.G., 1987. "Nature-Oriented Tourism in Costa Rica and Ecuador: Diagnosis of Research Needs and Project Opportunities", North Carolina, FPEI Working Paper No. 6, 18 p., GTZ- #86.

The purpose of the paper was to identify opportunities for research and future projects that will promote the growth of nature-oriented tourism enterprise. The needs in research and project development are itemized under three headings: Promotion, Marketing Surveys, and Management.

Lawry, S.W., 1989. "Tenure policy and natural resource management in Sahelian West Africa", Madison, WI, Land Tenure Center, 24 p., GTZ- #230.

Under the theme of the land tenure form of agriculture, pages 8-9 of this paper explain why security of tenure and freedom of management are critical needs for investment in sustainable agriculture. Where tenure rights are secure, returns on investment will accrue to the landholder and the benefits of improvements will not be claimed by someone else.

Lindberg, K., 1991. "Policies for maximizing nature tourism's ecological and economic benefits", GTZ- #826.

Page 25 of this report includes a passage on "Ensuring that Revenues Lead to Sustainable Development", referring to revenues from nature tourism. Some possible ways to channel those revenues, and augment them from other sources, are suggested.

Longman, K.A.; J. Jenik, 1987. *Tropical forest and its environment*, New York, John Wiley & Sons, 347 p., GTZ- #15.

This work gives a very general description of tropical forests and their problems. However, management on a sustainable basis is discussed fairly thoroughly in chapter 7. That discussion includes the degradation of the natural resources and the need for planning in the conservation effort.

Lugo, A., et al. 1987. *Ecological Development in the Humid Tropics: Guidelines for Planners*, CATIE- 333.73160913 E19.

Although the title of this book is very misleading, since the compilation of papers included does not constitute any type of a guide, but rather a variety of ideas, this could be used as a source for some of the characteristics of tropical forests which are not always considered during the process of their valuation. Sustainability and intrinsic value are the central aspects which are sometimes neglected.

MacKinnon, J.; K. MacKinnon, 1986. *Managing Protected Areas in the Tropics*, Gland, Switzerland, IUCN, 295 p., GTZ- #26.

Although this is concerned with the opposite subject from development, the methodology of selecting sites for protected areas uses many of the same factors including hydrological, agricultural and political considerations.

Markandya, A.; J. Richardson, 1992. *The Earthscan Reader in Environmental Economics*, London, Earthscan Publications, 469 p., GTZ- #74.

Two papers in this compilation may be of interest, although the first is somewhat technical. "The value of the environment: a state of the art survey" (p. 142), explains different methods of placing a value on all aspects of the environment, including non-use value. "Criteria for sustainable agricultural development" (p. 289), includes a schematic representation of policies for sustainable development.

Matsuura, P.T., 1989. "Participation of the rural poor in People's Organizations: The SEPAG Experience", Philippines, International Institute of Rural Reconstruction, 76 p., GTZ- #209.

This paper includes a fairly detailed report of the methodology (pp. 18-19) used when designing a program which concentrates on the people's participation in their own development. It also explains the importance of this idea.

Meadows, D.H., et al. 1992. *Beyond the Limits*, Post Hills, VT, Chelsea Green Publishing Company, 300 p., GTZ- #200.

This book attempts to be an overview of sustainability as a necessity for global welfare. The authors conclude that in the last 20 years some options for sustainability have narrowed, but others have opened up. Given some of the current technologies and institutions, there are real possibilities for reducing the streams of resources consumed and pollutants generated while increasing the quality of life. Some possible solutions are offered.

McCormick, Charles J. "Análisis Económico de Inversiones en Plantaciones Forestales en el Ecuador" ("Economic Analysis of Investments in Forest Plantations in Ecuador"), North Carolina, FPEI Working Paper No. 13, GTZ.

This manual is designed to evaluate current forest plantations, as well as to be used as a future reference. In the appendices a methodology is presented for analyzing future cases, which may use other management systems, different prices ranges, and varying yield levels.

McGaughey, S.E., 1988. "The role of multilateral agencies in promoting sustainable development", U. of Minnesota, 29 p., GTZ- RC P04 012.

This paper is a summary of the roles that multilateral agencies have played in the past in third-world development projects, and what some

of the most beneficial characteristics these agencies could take in the future in terms of sustainable development.

Medina C., H., 1988. "Métodos utilizados en la priorización de la investigación agropecuaria" ("Methods utilized to prioritize agricultural investigation"), Costa Rica, 83 p., IICA- INVES-ET A50 M491.

This document contains explanations of several methods to prioritize agricultural investigation through economic models, particularly cost-benefit analysis and its empirical applicability.

Molnar, J.J.; H.A. Clonts, 1983. *Transferring Food Production Technology to Developing Nations: Economic and Social Dimensions*, Boulder, CO, Westview Press, 175 p., IICA- INVES-ET E14t M725.

Chapter 6 of this book, "Inducing development at the micro-level: Theory and implications for technology transfer strategies", is unusual in its general treatment of technology transfer at the microregional phase, instead of at the regional phase.

Nadkarni, M.V., 1989. *The Political Economy of Forest Use and Management*, Newbury Park, CA, Sage Publications, 182 p., GTZ- #14.

This text includes a comparison of forest use as treated by local economies versus that of a larger state economy. The second half of the book is devoted to the dependence of the local economy on forest use.

Nair, P.K.R., 1984. "Soil productivity aspects of agroforestry", Nairobi, ICRAF, 85 p., GTZ- #203.

This book could be used as a resource tool for different methodologies of tying agroforestry and soil productivity and conservation together. Some suggested research approaches (pp. 68-72) are offered.

Nair, P.K.R., 1990. "The prospects for agroforestry in the tropics", Washington, D.C., The World Bank, 77 p., GTZ- #275.

Chapter 4, which is an analysis of economic and socio-cultural issues related to agroforestry, includes two interesting tables: one compares the main benefits and costs of agroforestry (p. 53) and the other describes economic factors affecting adoption of agroforestry practices in selected situations (p. 57). This second table also describes farmer response to the different situations.

Negi, S.S., 1986. *A Handbook of Social Forestry*, India, International Book Distributors, 178 p., GTZ- #12.

This book deals with various aspects of "social forestry" which the author describes as management and protection of forests and afforestation of barren lands with environmental and economic objectives. Text includes various recommendations and conclusions but lacks descriptions of methodology.

Norgaard, R.B., 1990. "Sustainability as Intergenerational Equity: The Challenge to Economic Thought and Practice", Washington, D.C., The World Bank, 75 p., GTZ- RC P04 022.

This paper could be used as source of detailed discussion of the subject of intergenerational equity. The argument put forth (p. 17) is that the apparent conflict between sustainability and efficiency is resolved by thinking of sustainability as a matter of intergenerational equity and that equity has not been incorporated properly into economic thought.

OECD, 1991. "Good practices for environmental impact assessment of development projects", Paris, 15 p., IICA- INVEST-ET P01 067g.

This is a very short outline of some environmental considerations which should be taken into account at the planning and assessment stages of a development project. The number of factors mentioned is large, but the explanations are very short.

Pant, M.M., 1984. *Forestry for Economic Development, India*, Medhawi Publishers, 240 p., GTZ- #11.

This work provides methodology for determining value of forestry, compared to other land uses, in a particular area. Calculations designed to compute the contribution of forestry to a particular microregion are included.

Parry, M., 1990. *Climate Change and World Agriculture*, London, Earthscan Publications, 157 p., GTZ- #27.

Chapter 3 is entitled "Methods of assessing impacts of climatic change", and outlines some of the possible approaches to climatic impact assessments and different models used to analyze the possible impacts of climate on a particular microregion.

Pedroni, L., 1992. "Metodología de trabajo para los consultores nacionales" ("Working methodology for local consultants"), GTZ- RC K10-78.

This is a guide with the purpose of informing the consultants in each Central American country about the requirements which must be included in a diagnostic of the regional forest situation, being done by the World Union for Nature (UICN).

Pigg, K.E., 1991. *The Future of Rural America: Anticipating Policies for Constructive Change*, Boulder, CO, Westview Press, 285 p., GTZ- #299.

This book has an interesting chapter, "Regenerating rural America" (p. 233), which explains regeneration as the process by which nature, people and communities heal after disturbance and increase their vitality. One of the case studies (p. 243), which takes place in Greenfield, Iowa, demonstrates the need for strong community morale when working toward a level of sustainable development.

Poore, D., 1989. *No Timber Without Trees: Sustainability in the Tropical Forest*, London, Earthscan Publications, 252 p., GTZ- #22.

The purpose of this study was to examine the management of tropical forest for the sustainable production of timber in certain countries: how much was being successfully managed in a sustainable manner; where management was succeeding, what local conditions made it successful; and where it had failed, the reasons for its failure.

Prestemon, J.P., 1989. "Efficiency and Employment in Ecuador's Sawnwood Industry", North Carolina, FPEI Working Paper No. 41, 48 p., GTZ- #87.

The survey methodology (pp. 32-37) used to gather data is interesting, concerning the solutions reached when accessing a large number of subjects was impractical, due to logistics and financial considerations.

Pulley, R.V., 1989. "Making the poor creditworthy: A case study of the Integrated Rural Development Program in India", Washington, D.C., The World Bank, 95 p., GTZ- #212.

The objective of the study is to show that the availability of sustained credit to the rural poor, who would not normally qualify as regular bank customers, is a necessary institutional factor in achieving rural sustainability.

Quijandria, B.; M.E. Ruiz, 1990. "Aspectos metodológicos del análisis social en el enfoque de sistemas de producción" ("Methodological aspects of social analyses which focus on production systems"), San Jose, C.R., IICA, 151 p., IICA- IICA A1/SC-91-04.

This paper presents several studies concerning methodology for the analysis of psychosocial phenomena, of social and cultural phenomena, and of the economy, which pertain to rural production systems.

Raintree, J.B., 1989. "Information management in agroforestry research and development: for whom and by whom?", Nairobi, ICRAF, CATIE- INFORAT IIMI Pub. No. 86-22 pp. 207-222.

The four main parts of this paper are entitled "Developing an agroforestry paradigm: the definition and early development of agroforestry"; "A methodology for agroforestry diagnosis and design; the development and characteristics of the D & D process"; "Agroforestry research for whom? The interactions between the three main types of people on the agroforestry scene"; and "Agroforestry informatics".

Raintree, J.B.; D.A. Taylor, 1992. "Research on Farmers' Objectives for Tree Breeding", Bangkok, Thailand, Winrock International, 132 p., GTZ.

This report, although indirectly related to the subject, contains a fairly complete description of the several methodologies used in the research. One of the objectives of the study was to determine sustainable types of trees. Explanation of methodologies begins on p.8.

Ramírez, Ricardo, 1989. "La participación del agricultor en la investigación: Alternativas para responder a las necesidades campesinas" (Farmer participation in research: Alternatives for responding to peasant needs"), GTZ.

The publication constitutes an introduction to agricultural research utilizing farmer participation. It describes the development of participative research from its roots in agricultural research. It continues with three different ways to categorize and classify new experiences, techniques and methodologies that have arisen under the title of participative agricultural research.

Reijntjes, C., *et al.* 1992. *Farming for the Future: An Introduction to Low-External-Input and Sustainable Agriculture*, London, MacMillan Press, 250 p., GTZ- #70.

Low-External-Input and Sustainable Agriculture (LEISA) refers to those forms of agriculture that: a) seek to optimize the use of locally available resources by combining the different components of the farm system so that they complement each other and have the greatest possible synergetic effects and b) seek ways of using external inputs only to the extent that they are needed to provide elements that are deficient in the ecosystem and to enhance available biological, physical and human resources.

Rodgers, K.P., 1992. "Honduras: Proyecto de Manejo de los Recursos Renovables de la Cuenca del Embalse El Cajón" ("Honduras: Management Project of Renewable Resources in the Embalse El Cajón Watershed"), Washington, D.C., Organization of American States, GTZ.

The project is the result of the interest of the Honduran government in preserving and sustaining the microregion surrounding this hydroelectric center. The plan examines social, economic and environmental factors.

Rojas, E., *et al.* 1988. "Land conservation in small developing countries: computer assisted studies in Saint Lucia", CATIE-"Ambio" 17:4 pp. 282-288.

A Geographic Information System (GIS) was constructed for the island to study the relations between land use, land capability, and human settlements. An overlay of land use with land capability shows the extent to which rural development is sustainable over time. The GIS provided detailed information on specific locations and quantification of critical trouble spots.

Scherr, S.J., 1991. "Methods for participatory on-farm agroforestry research", Nairobi, English Press, 72 p., GTZ- #80.

Although the title sounds very promising, this "summary proceedings of an international workshop" is basically just a few words about each paper given at the conference and the discussions that followed. Examples of papers given: "Methodologies for on-farm agroforestry technology trials: a case study of Talamanca, Costa Rica" and "Methods for on-farm agroforestry research: constraints, challenges and opportunities", both summarized on page 13.

Scherr, S.J., 1987. "Setting priorities for agroforestry research and development: potential contributions of economic research", Nairobi, ICRAF, CATIE- ICRAF-Working-Paper No. 51.

The second section of this paper is the most pertinent: Identifying research/recommendation domains for agroforestry- the Diagnosis and Design approach, and criteria for evaluating recommendation domains (biophysical conditions; organization of the production system; system constraints; landscape organization; and socioeconomic environment).

Scodari, P.F., 1990. *Wetlands Protection: The Role of Economics*, Washington, D.C., Environmental Law Institute, 89 p., GTZ- #64.

Chapter 3, "Principles and Methods for Valuing Wetland Goods", is an economically biased view of the methods which should be used to determine the value of a wetland region, although mention is made of the possible intrinsic values.

Secretaría de Estado de Agricultura, República Dominicana, 1981. "Diagnóstico Agropecuario de la Regional Central" ("Agricultural Diagnostic of the Central Region"), Dominican Republic, GTZ.

In this document the socio-economic and institutional variables that play an important role in the most efficient use of human, economic and

institutional resources that intervene in the regional agricultural development are analyzed. A superficial explanation of the methodology is included.

Simeón, M., 1985. "Using data processing tools for preparing agricultural development projects", GTZ.

Chapter 2, "Methodology for preparation of projects", provides a detailed description of the preparation stage of a project relating to the use of microcomputers to compile and organize data for analysis better.

Steppler, H.A.; P.K.R. Nair, 1987. *Agroforestry: a decade of development*, Nairobi, ICRAF, 335 p., GTZ- #269.

Chapters 3, 4 and 5 present some perspectives on agroforestry from the ecological, the institutional and the developmental viewpoints. Chapters 6, 7, 8, 9 and 10 describe the prominent agroforestry systems in some particular regions as seen by residents of each region or by persons with many years' experience there. Chapters 11, 12, and 13 cover problems associated with the measurement, impact and transfer of the technology of agroforestry interventions.

Swanson, B.E., *et al.* 1988. "Analyzing agricultural technology systems: Some methodological tools", 65 p., IICA- INVEST-ET E14 S972.

This paper outlines an analytical instrument for surveying agricultural technology systems. The first part of the instrument is a set of methodological tools which serve to organize data collection and to order data for comparison. The second part consists of flow system analyses of subsystems in the technology development and transfer system to determine how improved technology is expected to flow through to farmers.

Van de Laar, A., 1991. "The rural energy problem in developing countries: Diagnosis and policy approaches. A review of major issues", The Hague, Institute of Social Studies, 64 p., IICA- E14 L112.

The first few pages of this document are a diagnostic of the world rural energy situation with a short explanation of methodological and data issues. There is little discussion of this subject in relation to regionality or microregionality.

Vaughan, C., 1978. "Una metodología para determinar la existencia, abundancia relativa y migraciones de poblaciones de la fauna silvestre en las áreas silvestres de América Central" (A methodology for determining the existence, relative abundance, and population migration of forest fauna in the forested areas of Central America"), CATIE, 56 p., CATIE-OLAFO #50681.

After reviewing existing methods for estimating the abundance of different species, the author presents a system for studying the populations of species of mammals within a region. The system is adaptable to the majority of similar areas, which don't have an excess of specialized personnel, equipment, funding and also don't have a high priority in relation to other areas.

Warren, D.M.,...*et al.*, 1991. "Indigenous knowledge systems: Implications for agriculture and international development", Ames, IA, Iowa State University Research Foundation, 186 p., IICA- E14 W291.

The reason for mentioning this compilation of papers is the third chapter entitled "Strategies and methods for the access, integration, and utilization of indigenous knowledge in agriculture and rural development" (p.21), which advocates analyzing the usefulness of these methods, instead of only studying them.

Whelan, T., 1991. *Nature Tourism: Managing for the Environment*, Washington, D.C., Island Press, 233 p., GTZ- #253.

Two chapters in this book may have some relevance from the aspect of nature tourism as a form of sustainable development. Chapter 1, "Ecotourism and its role in sustainable development" and chapter 9 (p. 187) "Making ecotourism sustainable: Recommendations for planning, development and management".

World Bank, 1990. "Agricultural biotechnology: The next Green Revolution?", Washington, D.C., 51 p., GTZ- #292.

This paper addresses the socioeconomic issues and impacts of biotechnology as a possible factor in sustainable development. It also offers an overview of policy issues in selected countries relating to biotechnology.

Young, A., 1988. "Agricultural environments. Characterization, classification and mapping. Methods developed outside the international agricultural research system", Nairobi, ICRAF, 63 p., GTZ- #201.

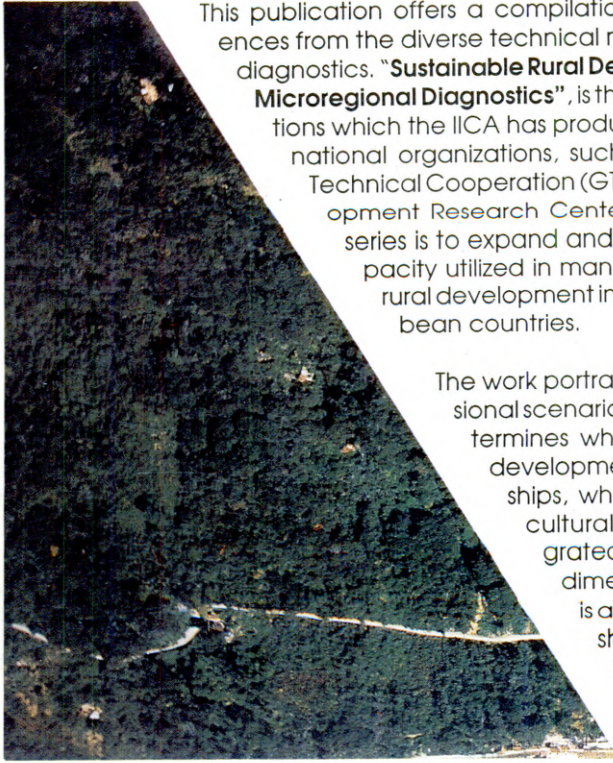
The first part of this paper contains reviews of methods employed to describe and map climate, landforms, soils and vegetation, and to assess land potential from these factors. It discusses methods of agroclimatic analysis, climatic indices, and methods for analysis of the effect of soils on land productivity. The second part covers methods to describe and map the physical environment as a whole, including the land systems approach and agro-ecological surveys.

Young, A., 1989. *Agroforestry for Soil Conservation*, United Kingdom, CAB International, 276 p., GTZ- #598.

This book is a review of the potential of agroforestry for soil conservation, treated in its wider sense to include both control of erosion and maintenance of fertility. The objectives are 1) to summarize the present state of knowledge on agroforestry in soil conservation, including both known capacity and apparent potential and 2) to indicate needs for research if this potential is to be fulfilled.

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This publication offers a compilation of specially selected references from the diverse technical material related to rural spatial diagnostics. **"Sustainable Rural Development: Methodologies for Microregional Diagnostics"**, is the second in a series of publications which the IICA has produced together with other international organizations, such as the German Agency for Technical Cooperation (GTZ) and the International Development Research Center (IDRC). The objective of this series is to expand and update current technical capacity utilized in managing the topic of sustainable rural development in the Latin American and Caribbean countries.

The work portrays agriculture as a multidimensional scenario, which contextualizes and determines what needs to be done in rural development. This entails multiple relationships, where agricultural and non-agricultural production are tightly integrated with the social and political dimensions. At the same time, there is a reciprocal rural-urban relationship, where both sectors rationally utilize renewable natural resources in defined spatial territories.