Institutional Series
Miscellaneous Publications N°6

CATIE'S CONTRIBUTION TO SUSTAINABLE RURAL DEVELOPMENT IN CENTRAL AMERICA :

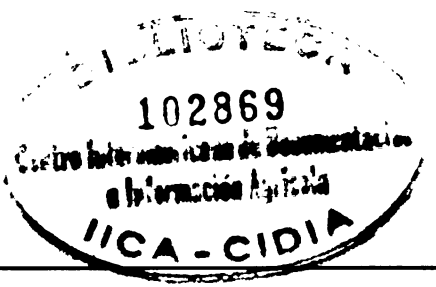
an overview of the impacts of CATIE/Olafo and Mangroves projects 1989-1998

Tropical Agricultural Research and
Higher Education Center

CATIE

Turrialba, Costa Rica
May, 1998

CATIE is an international, non-profit regional scientific and educational institution. Its main purpouse is research and education in the fields of agricultural science and natural resources and related subjects in the American tropics, with emphasis on Central America and the Caribbean.



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CATIE's contribution to sustainable rural development in Central America: an overview of the impacts of CATIE/OLAFO and Mangroves projects 1989-1998. -Turrialba, C.R.: CATIE, 1998.
20 p.; 23 cm. - (Institutional Series. Miscellaneous Publications/CATIE;no.6)

1. Rural development - Central America 2. Sustainable development - Central America 1. Title II. Series

INNOVATING IN RESEARCH AND DEVELOPMENT

A brief history

The origins of the "Conservation for Sustainable Development in Central America" commonly known as "Olafo Project" date back to 1984 when IUCN asked CATIE to enter a joint venture to implement and test the concepts of the World Conservation Strategy (IUCN-WWF-UNEP, 1980) in Central America. The result was the Olafo Project Proposal that was submitted to and approved by the Swedish International Development Agency (SIDA) and the Norwegian Agency for Development (NORAD). In 1993, the Danish International Development Agency (DANIDA) joined SIDA and NORAD in supporting the Project and in 1994 DANIDA became the leading agency on behalf of SIDA and NORAD. The Wise use of the mangroves resources in Estero Real (Nicaragua) and Terraba Sierpe (Costa Rica)" project, commonly known as "Mangrove project" began in 1992 with DANIDA's financing.

The publication of the Report on the World Commission of Environment and Development and the Bruntland Report spurred the drafting of the Project's new design in 1989. This shifted the thrust of the Project from one of conservation coupled with important biological research components to a field-based focused project aiming to test whether conservation and development could coexist harmoniously in the context of local communities managing their natural ecosystems.

Regional ecosystem diversity within reach

Three demonstrative areas were developed in the lowland tropical forests of Central America: Guatemala (Petén, San Miguel), Costa Rica (Talamanca), Panamá (Bocas del Toro). Two were established in mangrove ecosystems: Nicaragua (León and Estero Real on the Pacific Coast) and Costa Rica (Térraba Sierpe). In addition, two replication areas were initiated in Honduras (northern zone, Atlántida), and Guatemala (La Pasadita).

These areas are located on the edge of the agricultural frontier where production battles biological diversity. The traditional practice of slashing and burning opens the way for agricultural and cattle ranching expansion. The zone is characterized by: low population density, social heterogeneity and lack of organizational cohesion, difficult access, weak institutional presence and agricultural practices which are incompatible with the ecosystems' potential. Because of the project's demonstrative nature and the ecosystems' diversity, the beneficiaries are peasants, small cattle ranchers/"colonos," indigenous people, and all those who rely on forest and/or marine resource extraction.

The on hands approach

The Projects' objective is to implement, jointly with national institutions, rural development models for the sustainable management of natural ecosystems typical of Central

America's agricultural frontiers. The hypothesis is to demonstrate the viability of sustainable production in natural ecosystems in order to improve the population's quality of life while protecting the environment.

This includes three key elements:

- ◇ **sustainability:** ecological, economic, social/organizational and legal.
- ◇ **familial production system** which implies a productive goal, an integrated approach, and the active involvement of producers.
- ◇ **natural ecosystems** which define where the Project should intervene.

Olafo is committed to rural development bounded by a concrete strategy which promotes community involvement. Some of the Project's strategy aspects which reflect this commitment are:

- ◇ participatory approach to promote the involvement of the direct beneficiaries /users of natural resources in the decision-making process;
- ◇ multidisciplinary methods;
- ◇ analysis at different hierarchy levels (specie and component, familial unit, community/landscape and regional level) ;
- ◇ a hypothesis-testing-evaluation-decision process which requires a reflexive analysis based on sustainable development objective;
- ◇ the transfer of methodologies and experiences throughout the Region.

The main working lines to meet the challenge of innovating in research while demonstrating new ways of promoting development include:

Research & Validation

- Non-timber forest resource management (ecology/production through domestication in natural conditions)

- Diversified forest management (both timber and non-timber)
- Agroforestry and sustainable agriculture
- Economic evaluation of goods and environmental services
- Evaluation of family production system sustainability
- Participatory land use planning at a regional level

Community outreach

- Strengthening community organization for production based on natural resources
- Training and technical assistance

Institutional Outreach

- Training and technical assistance
- Generating technical knowledge for natural resource management policies

Teaching

- Masters Degree in Management and Conservation of Biodiversity

Outputs generated

Consistent with the demonstrative characteristic of the projects, the 3 most important products generated are useful for:

- ➛ demonstrating, in the field, the compatibility between conservation and development

- ➛ providing methodologies, and scientific and applied knowledge to national and regional institutions, in order to orient, with a holistic approach, the management of tropical biodiversity in its ecological, productive and human dimensions.

- supporting decision makers in regulatory processes for the sustainable management of natural resources in broadleaf and mangroves ecosystems.

MULTIPLE IMPACTS AT DIFFERENT SCALES

The rural population that benefited directly from the projects' activities amounts to more than 2,000 people (430 families) while short-term indirect beneficiaries (1999-2000) are conservatively estimated at 60,000 people (more than 10,000 families) due to the ripple effect (legal, organizational and technical) of demonstration/application areas in the Regions where they are located.

The Projects have impacted at four levels:

- **Local,** to demonstrate sustainable development in the field through:
  - ◇ Strengthened community self-reliance
  - ◇ Diversified use of tropical biodiversity, while protecting the environment
  - ◇ Improved socioeconomic levels for rural families
  - ◇ Increased involvement and participation of institutions and organizations

- **National**, to provide technical support for the promotion of policies/legal regulations for sustainable management of tropical biodiversity, conducing to:
- Institutional capability in conservation and development.
- Involving diverse actors from society, goverment and the productive sectors.

- **Regional,** to contribute to human resources development and cooperation among institutions, leading to:
- Institutional strengtheng in conservation and development.
- Having a multiplier effect of best experiences and practices in the region.

→ CATIE, to strengthen the institution's capacity for regional development

MERGING LOCAL CONSERVATION & DEVELOPMENT

◆ *BUILDING SELF-RELIANCE FOR TROPICAL BIODIVERSITY MANAGEMENT*

Olafo has helped empower 25 groups in Guatemala, Honduras, Nicaragua, Costa Rica and Panama. This notable impact benefited approximately 430 families. Of the total number of groups, 9 were legalized, and consequently are now in a position to formally negotiate for external support from technical and credit institutions and NGOs.

The groups have acquired greater self-governing, decision-making and conflict resolution skills, enabling the national institutions charged with the tasks of development and natural resource management to evolve their own activities. One key issue is that productive activities require entrepreneurial organization, which differs from that of the community associations. Therefore, the creation and strengthening of small rural enterprises have focused on those families directly involved in the activities.

In Guatemala, for example, the community model of rural development within the framework of Community Concessions has been designed and successfully implemented from the organizational, financial and legal standpoints. This concession earned presidential recognition on three occasions in 1995 and 1996. President Carpio awarded the community an honorary degree for sustainable agriculture; President Arzú,

during the International Earth Day, praised the community for its work in favor of the protection and sustainable use of biodiversity; and on the 75th Anniversary of the Ministry of Agriculture, Livestock and Food, special recognition was made for San Miguel's contribution to Sustainable Forest Development.

The success of the community organization empowerment for resource management has reached the point that some demonstration areas have become the model for rural families from other sites, and for international and national institutions and organizations. Such is the case of Térraba Sierpe, a product of the CATIE/IUCN Mangroves joint effort. This project was selected among 20 other projects at the international level to benefit from the logo Hannover Expo 2000. The registration agreement states: "The aim of the project is to protect the unique ecosystem of the mangroves and to demonstrate at the same time that it is an important reservoir to cover the people´s basic needs....The most visible result of the project is the formation of a cooperative for the multiple use of the mangroves; sustainable fishing industry, an ecological tourism park and sustainable woodworking."

These results stemmed from strategies focused on solving immediate needs. As a Honduran peasant aptly stated, "When the Project reached us, we awakened, since we weren't a community, but rather a disjointed village. We did not work together for common goals. Now when we decide to fix the road, we all participate actively in the endeavor. For me, the Project transfers knowledge, and this is what helps us to do good work. We know for a fact that our community will prosper" (Ceferino Guevara, Honduras).

This illustrates that improving local groups' management skills must be not only a means, but an end in itself, to promote conservation and development.

◆ *BRANCHING OUT*

Traditional and non-traditional productive alternatives: a new approach to solving urgent problems

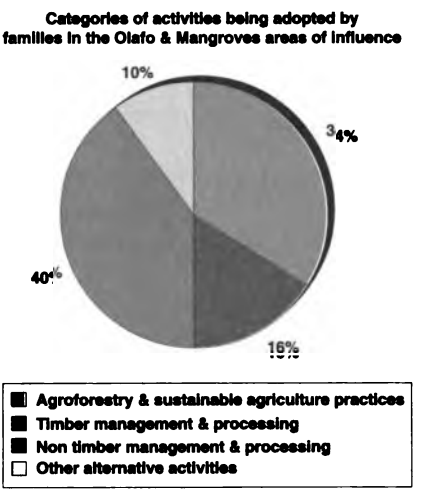
The diversity of ecosystems led the projects to develop research and validation on traditional and non-traditional resources: 9 non-timber products (medicinal, ornamental, fiber, biocide and tree forage), 4 agricultural products (cocoa, citrus, corn, ginger), timber harvesting in broadleaf and mangroves forest, and other complementary activities such as iguana breeding and honey bee production. *In situ* management is the primary means for developing sustainable harvesting practices of lesser known species, which, in turn, prompt the simultaneous generation of scientific data regarding the species. Due to the long-term nature of this process, it was also necessary to orient project activities to validate and implement short-term income generating activities.

In this manner, the strategy at the family level increased the diversity of the resources used. For example, in Guatemala, this increased from three to seven components.

Proven viability: Adoption of sustainable productive alternatives

From the total number of beneficiaries from the Projects, 80% (360 families) have adopted one or more of the fifteen productive alternatives promoted. The majority of these families are located in Guatemala (36%), followed by Panama (23%), Costa Rica (19%), Nicaragua (11%) and Honduras (10%).

Timber management/processing and agroforestry/sustainable agriculture practices were the most successfully adopted alternatives. This adoption implies not only an improvement in production but also in marketing and in organization.



Environmental protection

The rural development model leads to a holistic understanding of the inherent problems, and thus the design of compatible solutions for environmental conservation and development. For example, it is estimated that the cultivated areas in San Miguel, Petén, Guatemala have been reduced by 30%. This is mainly due to the adoption of sustainable forest harvesting, of improved agricultural practices and of other complementary activities. In addition, deforestation has been checked by obtaining land use rights, in the context of community concessions.

The positive impact of selected sustainable practices on crucial ecological functions of the Guatemalan ecosystem has been determined: the improved corn production system associated with green manure generates an economic income more than 3 times that generated by the traditional slash and burn system. 57% of this additional benefit corresponds to increased yields, 20% to the additional value of erosion control, 12% to weed control, 6% to nitrogen fixing and 5% to carbon capture.

- ***FOSTERING IMPROVED SOCIOECONOMIC FAMILY LEVEL***

Strategies for increasing family incomes

Sustainable timber harvesting in Nicaragua (Mangroves of the Pacific coast), Guatemala (Community Concession of San Miguel in Petén) and Costa Rica (cattle ranching farm in Talamanca) has allowed an increase of 2 to 3 times the return to labor invested in the activity when compared with the opportunity cost of labor in these areas. Other complementary activities, such as honey bee production in Guatemala, have generated similar improvement in the return to labor.

In the agricultural frontier, production for family consumption is a crucial objective for the families. For example, in Guatemala, goat-milk produced by using tree forage as fodder generates an annual non monetary income of US$550. This low cost new productive alternative provides milk to families, mainly children, who never had access to milk before. Another example is the processing of *Desmoncus.spp* (used in wickerwork for both local use and marketing) which generated more than US$200 per year. The potential use for this abundant resource was unknown to the local populous before the Project identified it. These income contributions are significant when considered that traditional production system annual family incomes were about US$950.

Total family income increase when compared to the reference state is one of the most important indicators for measuring development impact on rural families. This indicator varies from 20% in Talamanca, Costa Rica, to 80% in San Miguel Guatemala. In this latter case, this result is due to the incorporation of several new activities.

Improving employment opportunities

In every case the non-traditional productive alternatives (such as the biocide Quassia amara; honey bee production; and forest management) do not compete with traditional activities in terms of labor availability; instead, they are complementary.

The employment level on the farm in Talamanca, Costa Rica, where timber management was implemented, increased by 14%. In Petén, Guatemala the results show a more constant level of employment over time, thus reducing temporary unemployment, one of the major threats in the area.

◆ *BRIDGING THE GAP*

As a consequence of impacts generated in the field, several institutions, both governmental and non-governmental became interested in the experiences and became increasingly involved in the implementation of the demonstration areas. In particular, counterpart technicians' participation in the projects' national teams increased from 18% during the first phase (1989-1992) to 64% in the present phase (1998). Currently, these include Centro Maya/MAGA (Ministry of Agriculture) in Guatemala, PNDR (National Program for Rural Development) and MARENA (Ministry of Environment and Natural Resources) in Nicaragua, COHDEFOR (Honduran Corporation for Forest Development) in Honduras.

In addition to the significant participation of official counterparts, it is important to mention that about 30 institutions have been involved directly in the Projects´ areas: 25% in Nicaragua, 20% in Guatemala, 33% in Honduras, 9% in Costa Rica and 13% in Panama. Of these 30 institutions, 46% corresponds to Governmental institutions linked to agriculture service extension, public works, agriculture research. In addition international institutions and non-governmental organizations have collaborated.

PROMOTING POLICY UP-DATING

One of the critical issues for institutions dealing with natural resource research and/or rural development, is the legal limitations to the application of sustainable management practices. The Olafo and Mangroves projects attended the problem of land use rights recognition, (particularly in Guatemala) as a prerequisite for initiating a process of sustainable development. Additionally, in the case of of non-traditional resource management the Projects contributed to the definition of legal regulations.

Since 1994, the Government of Guatemala has recognized the Community Concession, as a legal entity. Based on the San Miguel experience, governmental institutions, International Agencies of Cooperation, NGO´s and communities consider the community concession as a powerful tool to promote natural resource conservation and community development in Petén.

In Nicaragua, a solid foundation for a mutually agreed upon participatory Land Use Planning Strategy of the pacific mangroves in Estero Real has been created via an effective communication network. Both MARENA and MEDEPESCA (Ministry for Fisheries Development) use the land use plan elaborated by the project as a basis for awarding concessions permits.

One of the most positive effects of efforts made in Nicaragua, is the approval and direct involvement of MARENA in the implementation of the first mangrove forest management plan.

In the case of Costa Rica, the Wildlife Direction of the Ministry of the Environment (MINAE) in charge of the application of CITES regulation adopted a technical proposal for regulating the sustainable use of *Zamia squinneri*, an endangered ornamental plant. Also, the Ministry of Health included technical recommendations for the cultivation and management of medicinal plants in the regulations about plants used for natural medicine production.

CREATING MULTIPLE WEALTH

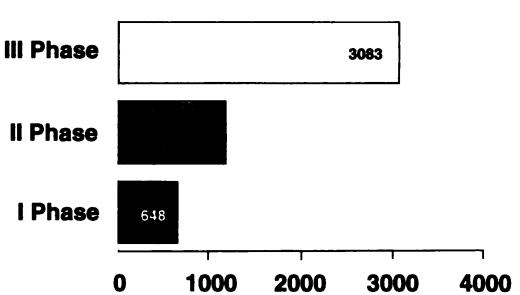
Olafo is creating socio-economic, environmental and biological wealth. For the last 9 years, governmental, non-governmental, private and community sectors from Central and Latin America have benefited from Olafo's and Mangroves' results and experiences. In fact, the demand for training, technical assistance and cooperation has increased significantly. Our philosophy is that professional training and education are the main weapons we have to ensure that the men and women in the national institutions, NGO's, projects and communities, are prepared to run sustainable rural development models.

◆ *TRAINING AND TEACHING FOR ACTION*

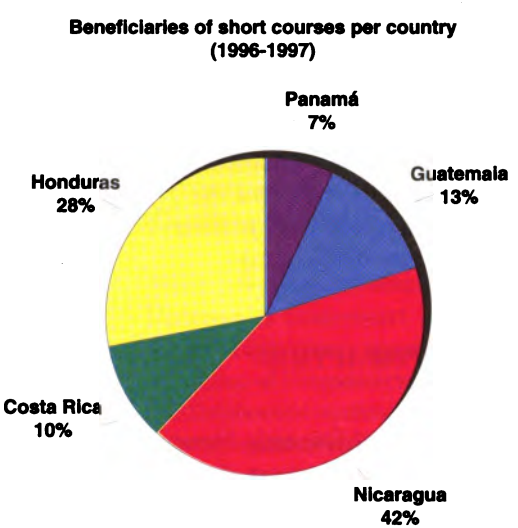
In fact, approximately 5000 technicians, extensionists, farmers and business-people from the private sector have been directly and indirectly involved in training and dissemination activities carried out through approximately 250 events such as in-service training, short courses, and local, national, and regional workshops.

In the last two years, Olafo and Mangroves have organized and participated in more than 100 events; 52% more than in the three year period of the first phase (1989-1992). The results generated provided the Projects with the ability to answer a growing demand for a transfer of their accumulated experience and new methodologies to the different stakeholders in the Region.

Beneficiaries of training & dissemination activities (Olafo Project 1989-1997)



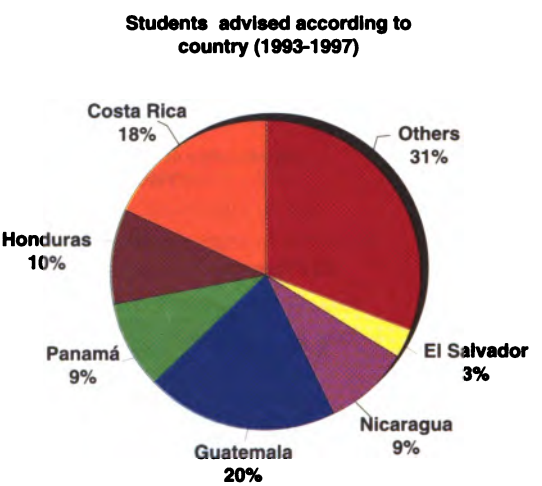
The demonstration and application areas played an important role in the organization of training and dissemination activities for Central American technicians.



Of the total training activities beneficiaries, 44% corresponds to governmental institutions, 27% to NGO´s, 24% to Universities (graduate and under graduate levels) and 5% to Olafo and Mangroves projects.

The impacts reach further than just training activities: the project´s personnel has contributed to 28 courses in CATIE´s Masters Program. In total, 104 students - 69 from CATIE´s Master Degree Program and 35 from other Universities- were advised by the Olafo Project technicians -including two Doctoral Thesis students and specialization research. Of the total number of students, 33 came from South America, North America and the Caribbean.

Once again, the demonstration areas took the role of protagonist, becoming a crucible for Latin American students. These, in turn, crystallized the knowledge gained and simultaneously provided research results for CATIE and the Region.



The professionals trained at CATIE and in other institutions are, today, our best allies in national institutions, non-governmental organizations and in other projects.

- ***THE TIES THAT BIND: COOPERATING WITHIN LATIN AMERICA***

Project activities resulted in opening spaces in the Region for several relevant issues for sustainability that had not been considered before, such as:

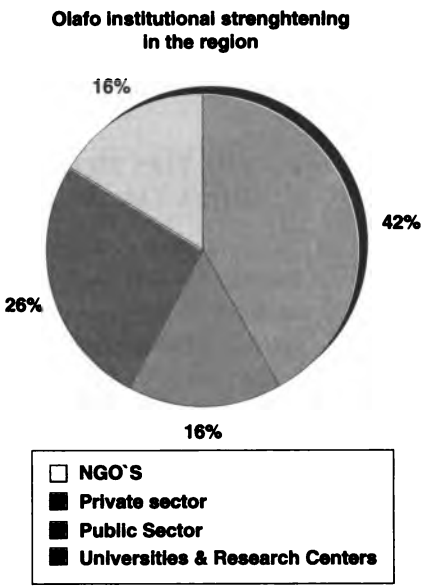
- Sustainable use of non timber forest resources
- Community management of natural forest
- Mangrove forest silviculture
- Community organization for production and conservation
- Economic evaluation of natural ecosystems
- Models for sustainable rural development based on the management of natural ecosystems.

These topics are particularly relevant to the technical strengthening of institutions accomplished mainly through assistance and cooperation to approximately 190 institutions of which 30 are in Central America, 9 are international and more than 150 others are involved in Networks.

The three main important impacts refer to the incorporation of new work lines within the NGO's, public and private sector institutions, universities and research centers; the establishment of strategic alliances; and the consolidation of topical networks.

In the case of institutions like the Technological Institute of Costa Rica (ITCR), the National School of Agriculture (ENA) and the University Center of the Atlantic Coast in Honduras (CURLA) among others, the incorporation of work lines refers to research, training and teaching in the management of timber and non-timber forest products.

In this context, strategic alliances have been developed with regional and international institutions such as the Central American Cientific Research and Popular Uses of Medicinal Plants in the Caribbean Program (TRAMIL) , the World Wildlife Fund (WWF), The World Conservation Union (IUCN), and the Iberoamerican Program of Science and Technology for Development (CYTED), among others.



In the field of regional cooperation, the impetus the Project gave to consolidate three topical networks stands out. These are: the Mesoamerican and Caribbean Herbarium Network with 23 members; the Iberoamerican Network for Pharmaceutical Plant Products (RIPROFITO) in which 69 institutions participate, and the BIODATA Network in Costa Rica. This network has the objective of facilitating the administration, the generation and exchange of information in order to conserve, know, disseminate and use the country's biodiversity sustainably (60 institutions participate).

ON THE CUTTING EDGE

CATIE plays a key role in the region in human resources development, training and research in agriculture and natural resource management. Olafo was a key player in strengthening CATIE's activities in sustainability and related fields. Nowdays, CATIE has a premier program in conservation and development which is carried out through the Biodiversity Management and Conservation Unit.

As stated by the Danida Review Mission (1997), "CATIE has gained extensive experience in mangrove management, tropical and sub tropical forest management, as well as validation and utilization of non-forest products at all levels through work with local users, local and national organizations, institutions (incuding research) and other authorities. This has built up a valuable experience within CATIE....Besides technical expertise, CATIE has achieved valuable knowledge about the processes necessary to reach goals by means of interdisciplinary work."

The Projects´ impacts on CATIE´s activities are directly reflected in the incorporation, within its permanent working lines, of the three main lines of action developed by the Olafo and Mangroves projects:

i) design of diversified forest management. This includes research on ecology and productive potential characteristics of non-timber species and the design of management plans for diversified forest management, with local population participation;

ii) evaluation of direct and indirect benefits from the forests;

iii) rural development based on the management of natural ecosystems focusing on the improvement of family productions systems, community organization and sustainability evaluation assessment.

Other important issue was the establishment of the emphasis in Biodiversity Management and Conservation within the Masters Program, and Graduate courses teaching and Graduate Thesis guidance developed on a regular basis.

Finally, due to projects efforts in synthesizing its results, an International Strategic Course on Rural Development based on the management of natural ecosystems has been created; in addition, original topics developed by Olafo and Mangroves have been incorporated in other CATIE courses.

As stated by the Danida Evaluation Mission (1997), "the model leads to a holistic understanding of the problems

encountered on farms and in communities, which often cannot be solved by technical inputs only, but need to take into account social, economical and organizational perspectives. This approach will to a larger extent make CATIE able to reach the poorest farmers with solutions from its research and thereby be able to provide tools for extensionists and future CATIE students to work with farmers and communities, providing general and not only technical solutions."

WHAT'S NEXT?

The processes developed by CATIE/Olafo and Mangroves projects showed that in addition to improving income and employment, the most important achievements are the mechanisms that were built within the communities which allow them to continue their search for a better future, through their own efforts, long after Olafo and Mangroves depart.

CATIE is in a better position to respond more effectively to increased demands from stakeholders in the region in conservation and development matters. Institutions in the region are better prepared to face the challenges of sustained development through practiced solutions based on community self-reliance.

If we consider that sustainable development is not a final stage that can be reached sometime, but an endless search to ease the changing tensions between human needs and the capacity of the environment to provide goods and services to satisfy those needs without degradation, it is evident that the mechanisms built into these communities are the best contribution of any project to sustainability.

Neverthelless, these is still a lot to be done, a lot to be tried, and lot of wealth to be created to alleviate poverty and protect the environment-simultaneously. This task needs further support for community development, and for the active participation of the people of Central America.