

EXECUTIVE SUMMARY

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The ANAI Agroforestry Project in the Canton of Talamanca is instituting a community development program through the intensification of agroforestry activities with the goal of selling and exporting tropical fruits and spices and their products. Efforts to date have concentrated on nursery and production activities resulting in over one million new fruit and spice trees planted in the project area. Production is beginning and plans for postharvest activities are being made. This assessment recommends: maintain the production development activities to support postharvest programs, develop a production information system to be able to plan for marketing and other postharvest activities, solicit adaptive research to improve cacao fermenting and drying activities, solicit adaptive research on the drying of black pepper and tropical spices, conduct studies on markets for and feasibility of processing tropical fruits, provide postharvest management skills training, and develop a market information system.

The NZP in the Canton of Upala has instituted a community development project through the provision of roads, bridges, water supplies, land settlement, schools, agricultural services, community services, and other government inputs. The Costa Rican Government wants to ensure that economic development proceeds to utilize the inputs. This report,

with respect to NTAE needs, recommends: change NZP focus from infrastructure to economic and community development, provide an economic development plan for the region, identify priority NTAE crops, provide support services for NTAE activities, insure adequate agricultural credit for new settlers, and consider the same postharvest and marketing needs as for the ANAI Project.



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POSTHARVEST INSTITUTE FOR PERISHABLES

ASSESSMENT OF POSTHARVEST HANDLING AND MARKETING NEEDS
FOR NON-TRADITIONAL AGRICULTURAL EXPORT CROPS IN THE
ANAI AGROFORESTRY PROJECT
AND THE USAID NORTHERN ZONE PROJECT OF COSTA RICA

by

Thomas V. Dechert

Cooperative Agreement AID/DAN-1323-A-00-5093-00
USAID Science & Technology Agriculture

GTS Report No.

PIP/Costa Rica/June 87/No. 93

Submitted to
U.S. Agency for International Development, Costa Rica
Appropriate Technology International, Washington, D.C.



University of Idaho

College of Agriculture

In cooperation with

**United States Agency for
International Development**

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The assessment would have been impossible without the support provided by personnel from the Asociacion de los Nuevos Alquimistas Internacional (ANAI), Appropriate Technology International (ATI), and the USAID funded Northern Zone Project. Special thanks are offered to Robert Mack and James Lynch from ANAI who provided a guided tour and the hospitality of the ANAI Agroforestry Project in Puerto Viejo, and Ms. Valeria Budinich of ATI, who provided transportation and valuable input to the discovery process. Similarly, many thanks are offered to Harry Peacock and his wife for the time, transportation, hospitality, and support provided for the tour of the Northern Zone Project in Upala.

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INTRODUCTION

Costa Rica has an active program in the promotion of non-traditional agricultural export (NTAE) products. The program addresses production, postharvest handling, and policy issues of NTAE products. The Mission is concerned that small farmers reap the benefits of the income generated by marketing the NTAE products. Accordingly, the Mission is supporting efforts by cooperatives, agrarian unions, and rural associations to produce, process, store, and market NTAE crops.

Cacao, identified as a major NTAE crop, has received considerable inputs for improved production, but little attention to its postharvest handling and marketing. Similarly, NTAE crops such as tropical fruits, spices, and vegetables have been produced successfully by small farmers, but postharvest handling and marketing systems need to be improved.

In order to better address the postharvest handling and marketing problems for NTAE crops being produced in humid tropical areas of Costa Rica, the USAID Mission requested assistance from the Postharvest Institute for Perishables (PIP) "to visit two representative areas of Costa Rica and provide an assessment of the postharvest technology improvements required to prevent quality loss between harvest and export in cacao, black pepper, and turmeric." PIP Assistant Field Director, Thomas Dechert, travelled to Costa Rica June 1 - 10, 1987, to assess the postharvest situation in two project areas: The Asociacion de los Nuevos Alquimistas, Internacional (ANAI) Agroforestry Project in the Canton of Talamanca, and the USAID/Costa Rica Northern Zone Project in the Canton of Upala.

USAID/Costa Rica provided the following "Scope of Work":

1. The consultant will become familiar with the NTAE programs initiated by the Private Agriculture and Agroindustry Council (CAAP) and USAID (1 day).
2. The consultant will travel to Puerto Viejo, in the Canton of Talamanca, to make a technical review of cacao, black pepper, and turmeric post-harvest handling. Transportation will be provided by ANAI, as will local introductions and information (3 days).
3. The consultant will travel to Upala, in the Canton of Upala, to make a technical review of cacao and black pepper post-harvest handling. Transportation will be provided by the Mission's Northern Zone Project, as will local introductions and information (3 days).
4. The consultant will make a preliminary verbal report of findings to the Chief, Rural Development Division, prior to departure.

In addition to the USAID/Costa Rica assistance request, the work and report of the ANAI/Talamanca project was also requested by Appropriate Technology International (ATI) as a needs assessment relating to their involvement in the ANAI Agroforestry Project. The ANAI Agroforestry Project has been operating for a number of years with funding from various sources. Currently, ANAI is seeking funding from both USAID/Costa Rica and ATI/Costa Rica. This report identifies needs of the ANAI Agroforestry Project which should be considered for inputs by USAID/Costa Rica and ATI/Costa Rica.

The report has two sections -- one for Talamanca, which is of interest to both USAID and ATI, and one for Upala, which

primarily concerns USAID -- with conclusions for each section and final comments about needs common to both areas.

ANAI AGROFORESTRY PROJECT

Background

Background information for the ANAI Agroforestry Project is filed in reports and proposals submitted to USAID an ATI by ANAI, and does not warrant extensive reiteration. The ANAI Agroforestry Project has evolved over 14 years from the ideas of a few individuals to an economic venture that will have a significant impact on the whole of the Costa Rican Canton of Talamanca. The list of its achievements and subsequent needs to maintain progress in the Talamanca area are substantial (Annexes I and II).

The Canton of Talamanca has been one of the most remote and underdeveloped areas in Costa Rica. The situation is changing rapidly as the result of recent extensions of the national road and electrical systems into the area. Talamanca is the southeastern-most Canton of Costa Rica, bordering Panama, limited by the Caribbean Sea on the east and the crest of the Talamanca mountain range on the west. The area is humid tropical, with precipitation greater than 2000 mm/year and mean annual temperatures between 70 and 80 degrees Fahrenheit. Physiography ranges from coastal and alluvial river plains to hills, valleys, and mountains which rise to 3800 meters, the highest in Costa Rica. The ANAI project areas lies along the coast and the adjacent alluvial plains, lower hills and mountain valleys.

The ANAI Agroforestry Project area encompasses 25 to 30 communities. Ethnic backgrounds of the communities vary

from Blacks of African/Caribbean extraction along the coast, to Latino settlers from Costa Rica and Central America in the banana/plantain and cacao plantation areas, to tribal American Indians in the hills and mountains, dominantly in the Talamanca Indian Reserve. Economic activity has centered around production of cacao and plantains by small farmers and banana or plantain plantations managed by "the company". The activity was supplemented by subsistence farming, fishing, a few government jobs, and, recently, tourism. In the case of the Indian communities, nearly all activity has been subsistence farming, food gathering, and hunting.

Both the cacao and banana/plantain plantations have been subject to severe economic down-turns. In the case of cacao, the advent of Monilia Pod Rot and subsequently Black Pod Rot has led some farmers to abandon their plantations, or at least minimize their upkeep, since production and prices were so low they had become uneconomic. Recently, methods have been devised by the Tropical Agricultural Research Center (CATIE) to upgrade the plantations and control the diseases, leading to increased interest in the cacao plantations. In the case of the banana/plantain plantations, both the work available on the company lands and the markets for the small farmers have been dependent on the vagaries of the major banana companies. With the recently improved roads and better local organization through Coopetalamanca, R.L., a local farmers cooperative, Talamancans have better access to regional and national markets.

The ANAI Agroforestry Project was planned and began implementation in the late 1970's and early 1980's, prior to the recent economic upswing and infrastructural improvements within the Talamanca region. The concept behind the project is to organize the communities around agroforestry

activities which will lead to production and marketing of unique commodities. These activities will improve the economic well-being and self-esteem of the communities. The long term goal of the ANAI project is for the Talamanca region to become a center for production and processing of quality tropical tree fruits and their products.

The immense and long term scope of the project can best be appreciated when one realizes that the ANAI project began when the Indian communities had virtually no organized, modern economic activity. The goal is to involve them at a community level in international marketing and commerce. Therefore, project activities must be considered from both economic and social development points of view, with social development including individual, community, regional (inter-community), national, and international levels. The economic development of the Talamanca region has been complicated by migration into the area of new economic activities and people; tourism, logging, coal mining, and other new activities are competing for the labor and interests of the indigenous population.

The ANAI Agroforestry Project is committed to the development of village and association level economies based on a polyculture of perennial crops, mainly trees. One assumption is that a diversified economy based on the products of a polyculture, including cacao, will be more stable than one based solely on cacao, with or without bananas and plantains. A second assumption is that the perennial tree cropping system will be environmentally benign since it will more or less reflect the structure and function of the natural forests, except that management will allow for more intensive harvest of fruits and seeds.

ANAI Agroforestry Project Accomplishments 1980 -- 1986

The ANAI Agroforestry Project is not a single project as defined by a given document with a time period and budget; rather, the project refers to various agroforestry development activities of ANAI in the Talamanca Canton. Although ANAI was involved in Talamanca before 1980, most of their agroforestry activities have been initiated since then. Funding has come from various sources within and outside of Costa Rica. One of ANAI's strengths has been its ability to solicit funds from various sources and coordinate their use to meet project goals.

Accomplishments of the ANAI Agroforestry Project are summarized in Annex I. The project has organized nurseries in 25 communities and has used the nurseries as organizational and educational foci in the communities. The nurseries are operated by community members and thereby bring the members together to work in the nursery and plan other activities. These activities have resulted in the establishment and management of 25 nurseries and over one million trees, of which about 70% are cacao. The trees have been planted by about 1200 small farmers, resulting in approximately 1000 new hectares of cacao and tropical fruit trees. Presently, the cacao and some of the faster growing fruit trees are beginning to produce.

Even without the benefit of a data base on the pre-project sociological situation, it is clear from the well managed nurseries and the general interest of the communities that considerable progress has been made in organizing the communities and helping them develop a new sense of direction for some of their economic activities. ANAI has encouraged community commitment through explanation and discussion of ideas and ideals, without any overt attempts to change the underlying structure or functioning of the

communities. ANAI has assumed that the necessary changes in community structure and function will evolve as a result of the demands of the new economic activities.

Consultant Assessment of ANAI Agroforestry Project

June 2 - 4, 1987, the PIP consultant met and travelled with ANAI members and Ms. Valeria Budinich of Appropriate Technology, Int. (ATI) to visit the project area around Puerto Viejo in Talamanca. The team saw various functioning and non-functioning dryers for cacao and black pepper; the Tropical Agriculture Research and Training Center (CATIE) cacao experimental farm; various nurseries, orchards, and plantations; several of the communities and their nurseries; and the general situation and infrastructure of the area. On June 5, a short verbal report of the trip was given to Mr. Ross Wherry, ADO/USAID/Costa Rica. Later the same day, the consultant met with Sr. Ernesto Ruiz, the manager of "Cacao Products of Costa Rica", the purchaser of 70 - 80% of the cacao produced in Costa Rica.

In general, the ANAI Agroforestry Project has made remarkable progress, given the physiographic constraints of the area, the low level of infrastructure, and the various funding sources ANAI deals with. It has accomplished its goals of organizing the communities around the nurseries and developing agroforestry management skills of the small farmers. It has introduced the new CATIE management package for upgrading old cacao plantations and introduced the new hybrids. Even though ANAI has not received significant USAID funding, its goals are remarkably similar to the USAID/Costa Rica Non-Traditional Agricultural Export (NTAE) program goals. ANAI is working with commodities, especially cacao, which have reasonable potential as export crops, and it is trying to devise methods to insure that the benefits

of accessing export markets will be enjoyed by the small farmers/producers.

Consultant Assessment of ANAI Internal Needs

The ANAI Agroforestry Project goals for 1987 - 1988 are presented as Annex II. This report discusses progress of the project, requirements to meet the 1987 - 1988 goals, and needs to make the project self sustaining.

ANAI is committed to changing the community organizational focus from the community nursery and production activities to postharvest handling and marketing activities. This needs to be accomplished without losing the momentum of the nurseries and improved small farmer production because increasing production provides the basis for the planned growth in postharvest handling and marketing activities. The need for postharvest handling and marketing is being driven by the beginning of production of the cacao and fruits; however, the nurseries and production systems are not sufficiently developed to continue on their own. Therefore, the project is faced with a large increase in its scope of activities.

Concurrent with this need for increased scope of the project, ANAI is facing the culmination of a large portion of the operating funds provided by the Costa Rican government (GoCR) Costarricense de Iniciativas de Desarrollo (CINDE) and the Asociacion Costarricense para Organizaciones de Desarrollo (ACORDE). ACORDE has indicated that further funding will be forthcoming once ANAI transfers responsibility for the funds to a Costa Rican organization. ANAI is working towards the creation of a legal Costa Rican "Asociacion" of producers and marketers in the Talamanca area, and it is hoped that this association will meet the

requirements of ACORDE. Even assuming this situation develops, ANAI will probably be faced with budget cuts for existing operations, just when it needs to be expanding its operations.

Given ANAI's funding situation and its need to reorient its inputs, there are several aspects of the Agroforestry Project which require attention. This report covers general needs, but emphasizes those in the postharvest handling and marketing situation with cacao, black pepper, and turmeric. The intent is to provide ANAI and potential funding agencies a framework to evaluate needed inputs and their costs. Ideally, an assessment of an agricultural system evaluates four areas: A) the macro-environment, B) production practices, C) postharvest handling, and D) marketing of the commodities involved. The macro-environmental and production aspects need to be continually evaluated and updated as the postharvest handling and marketing components of the systems develop.

A) The Macro-environment

Based on a rapid appraisal of the macro-environment of the project area, most aspects seem to have been considered and are contributing to the accomplishment of project goals. Crops have been selected which are congruent with the national policy goals of non-traditional export crops, and which are appropriate for the environment. The crops are being introduced in the traditional farming systems and links are being developed to access the national information systems for production of these crops. Planting materials have been selected which appear to be appropriate to the environment, and systems are being organized to continue to improve the quality of the planting materials. The recently developed infrastructure will contribute to the success of

the project, assuming other more lucrative economic activities don't supplant agroforestry.

The macro-social, -political, -economic, and -physical environments for the ANAI Agroforestry Project are changing rapidly and should be evaluated frequently to insure that the changes do not impair the attainment of important project goals. There are some concerns about the local environment which need to be examined; these center around the social organizations and institutions in the project area and connecting the project area to the rest of Costa Rica. For example, it is not clear that the Indian communities are willing or prepared to change their society to deal with the fast-paced market economy required by agricultural exporting. It is also unclear whether any of the communities in the area are prepared for the changes necessary to begin harvesting, handling, and marketing a large array of fruits and spices.

Besides the internal community organization, which ANAI has handled quite adeptly in the development of the nurseries and orchards, postharvest handling and marketing will require more organizational links with the rest of Costa Rica. Talamancans will be required to change their relations with the outside world. This project must link Talamanca to the governmental and marketing institutions of Costa Rica and will have to develop many of its own. While ANAI thinks these linkages can be guided while they develop as the result of economic necessity, this aspect should be carefully monitored to insure that it doesn't develop some undesirable social or economic aberrations.

B) Production

Production of agroforestry products has been the main thrust of this project and has received the most attention. The

community nurseries, while serving as organizational foci, have resulted in considerable training in production practices and have insured the introduction of the practices into the farmers' systems. The maintenance of nurseries and expansion of farmers' orchards and gardens will create a continuing demand for information and assistance in the production of traditional crops such as cacao, and much more for the introduced species. The state of the production art for most of the crops introduced in the Talamanca area is in its infancy and could stagnate, if not collapse, without continued support. If one considers ANAI's goal of training the farmers to select, breed, and graft for higher quality and productivity, it becomes clear that the program is just getting started.

ANAI has in place most of the elements necessary to develop a good production program. They are working to develop the institutional links to the national research and extension centers. Their list of educational and training accomplishments and goals is impressive, and, if continued, should result in a sustainable agricultural production base in a few years. This includes developing the knowledge of available services and information sources to keep the production system healthy.

One concern about the production system, however, is the status of the nurseries. The nurseries are community operated, while the rest of the production base is in the hands of individuals or families. The concept of a community nursery as an organizational tool has served its purpose, and the goal is to change the organizational foci to the processing and marketing centers. The question is whether the existing nurseries will be phased out over the next few years and replaced by private nursery activities, or whether the present nurseries will be privatized. The nurseries in their present status probably cannot be

sustained without continued external support, and it is not clear that demand for nursery plants will be sufficient to support nursery operators. Still, some consideration should be given to the long term existence of nurseries as the base for a healthy agroforestry production system.

Another consideration about production related to postharvest handling and marketing has to do with data about production costs, area in production, productivity, and other information necessary for feasibility studies. The ANAI non-intrusive approach to community development has resulted in a minimum of data collected. As the project begins to gear up for marketing, collecting the requisite information for an economic feasibility study will be the first of many activities which will require more interaction with the local communities. Effective involvement in an external marketing system requires a flow of ideas and information resulting in internal management changes to meet the demands of the markets. An agroforestry-based system of production is inherently less flexible than an annual crop-based system. Therefore, the information flow and usage will have to be more sophisticated in terms of recognizing and responding to market demands in a long-term time frame. This project will need a systematic internal data base which can be easily and continually updated.

c) Postharvest Handling

In the initial stages of development of the ANAI project, it was assumed that markets could be located or developed for the tree crops being introduced. As people in the project begin to consider the capital investments for postharvest handling and marketing, economic, market, and social evaluations will be necessary to determine whether the assumption is true on a commodity-by-commodity basis.

The scope of work for this technical review required assessments for cacao, black pepper, and turmeric. Since the consultant did not see any facilities for the handling of turmeric, no comments on this commodity are included. However, ANAI and ATI requested input regarding processing of acid fruits, since this is the next commodity which will be produced in quantity in the Talamanca area.

Traditionally, postharvest handling of cacao involves transportation, husking, fermentation, drying, storage, and, in some cases, grading. Some groups in Costa Rica have become involved in agro-processing, and ANAI plans to do some agro-processing in the Talamanca area.

The consultant saw a number of cacao fermentation and drying facilities. In this area of Costa Rica, no standard exists for the duration of fermentation. The literature recommends four to ten days, depending on the situation and type of cacao beans. In the Talamanca area, cacao beans are reportedly fermented from three to seven days, with many beans not fermented at all. The beans examined had been fermented three to four days, and did not appear to have been fermented long enough. Determination of appropriate fermentation time is reportedly complicated by the fact that the new cacao hybrids produce a wide variety of types and sizes of beans which ferment at different rates. The various practices and opinions about the length of fermentation indicated a lack of consensus or knowledge of how to ferment the beans to produce the quality which might command a better market price.

The case with drying the beans appears to be better understood. A number of different drying methods are employed in the area. The beans must be dried to between seven and fifteen percent humidity in order for them not to mold during transportation and storage. The drying must

take place over a minimum of two to three days to insure dehydration through the whole bean, but must be done quickly enough so the beans do not mold. The common method is solar drying on large mesh trays which hold up to one ton of wet beans. Although the trays can be covered when it rains, this method has limitations during prolonged rainy periods.

Other dryers employ various methods for using firewood-generated heat to completely replace or provide an occasional alternative to solar energy. The most common of the firewood-driven dryers is some version of the "Samoan dryer," which is based on heat transfer from a large horizontal chimney to limited air flowing through a space around the chimney below the mesh tray. The air then rises through the beans on the tray. These dryers have a number of limitations, including: 1) loss of heat because the firebox is outside the heat transfer chamber; 2) little or no control of air flow into the firebox, so there is little control of the amount of heat produced except through the amount of wood placed in the firebox; 3) potential scorching of the beans because the chimney in the heat transfer chamber is too close to the beans; 4) poor control of the air flowing through the heat transfer chamber; 5) poor insulation of the walls of the heat transfer chamber; and 6) limited use of the heated air since it only flows through one tray (layer) of cacao beans before escaping to the atmosphere.

For quality cacao, drying should be slow and even. To accomplish this, the construction and management of the Samoan dryers could be improved, especially to control the drying process. Since the ANAI project will be producing black pepper, herbs, and other commodities which have similar slow drying requirements, it seems reasonable to consider redesigning the Samoan dryers, using basically the same simple technology, but improving the control of the

heat produced. Besides abundant firewood, coal is available in the Talamanca area, so efficient use of the heat produced may not be as critical as control of the heat, but any new design should consider this aspect as well.

One firewood-driven black pepper dryer was seen, which was basically a Samoan type dryer, although much smaller than for cacao. It had numerous trays stacked vertically so the heated air flowed through them all, increasing the efficiency of the heat use. This dryer still had the limitations of the firebox being outside the heat transfer chamber and no control of air flow into the firebox. This dryer was reportedly used for drying leafy spices as well. Apart from the different size of the trays in the dryer, there appears to be little difference in the structural requirements of dryers for black pepper and cacao, or even the leafy spices. The primary difference appears to be in the management of the dryer, especially in the amount of heat.

In the case of postharvest handling of tropical acid fruits which are beginning to be produced in the Talamanca area, ANAI is interested in processing the fruits to produce frozen and fresh fruit juices which could be sold in national or international markets. The consultant saw one pilot-sized processing plant and discussed with ANAI the information necessary to determine the economic feasibility of constructing a plant in the Talamanca area.

The appropriate information is not readily available for proper consideration of the economic feasibility of the technological inputs being considered for improved postharvest handling of cacao, black pepper, leafy spices, or the acid fruits. Since feasibility studies should be made before the introduction of any of the postharvest handling technologies, consideration should be given to

gathering the necessary information. As discussed above, ANAI will have to quantify how much of, and at what cost, a commodity is being produced in the Talamanca area. The potential markets and the prices for cacao and black pepper are fairly well known, so this information should not be too difficult to obtain. The technologies being considered for fermentation and drying are not very expensive, and their management is fairly simple, so their economic feasibility seems reasonably assured. The case with processed acid fruits is more in doubt since the information about both the production and the markets, as well as the costs for building and operating the processing plant, will be more difficult to obtain.

The other major consideration for the postharvest handling needs of cacao, black pepper, acid fruits, or any commodity to be produced in the Talamanca area, is management of the technology. ANAI has done a remarkable job in the introduction of new agroforestry production technology and has an ongoing training program in its management and improvement. The same close attention will have to be given to each of the new postharvest technologies to be introduced. Since ANAI plans to change the community organization focus from the community nurseries to the postharvest handling centers, learning to manage these centers will be a major part of the community organization activity.

As the project continues to develop, required management skills are going to continue to grow, diversify and become specialized. These new skills will include nursery management, farm management, plant breeding and selection, dryer management, cacao agro-processing, acid fruit processing plant management, marketing, bookkeeping, and international finance. The demands for developing and maintaining training programs for new management skills will

continue to increase and will require the involvement of more outside trainers -- probably more than the current capabilities of ANAI.

D) Marketing

Marketing was discussed in general terms with personnel at ANAI. ANAI has some ideas of how it would like to direct and change the marketing of agricultural and forestry products from Talamanca, but very little of a specific nature has been accomplished. ANAI is interested in export markets, especially for cacao, since it's not clear whether the domestic market will pay for the quality ANAI plans to produce. ANAI is considering establishing its own marketing organization through the local association of producers and handlers. It is considering ways to by-pass traditional middlemen of the marketing process, with the idea that more of the profits would flow back to the area. ANAI is looking for ways to establish Talamanca's image as an area which produces high quality tropical fruits, spices and cacao. It is also investigating the markets for organic cacao.

On June 5, the consultant met with Ernesto Ruiz, Jr., the operations manager of the family owned Cacao Products of Costa Rica, Inc., which purchases about three quarters of the cacao produced in Costa Rica and produces various candies, confections, and flavoring. In addition to cacao beans bought in Costa Rica, the company imports cacao beans from Honduras, Guatemala, and other countries to meet their production needs. While Mr. Ruiz states the company supports improved cacao quality, it does not in fact pay a premium for quality cacao. In general, the price paid in Costa Rica is 10% less than New York spot price for the commodity. Cacao prices are lowered for moisture content above 15%. However, the same price is paid for dried cacao beans whether or not the beans have been fermented.

Essentially, there is no incentive for the added labor of fermenting the cacao beans to produce the higher quality cacao. When the consultant queried Mr. Ruiz for his reaction to certain organizations planning to market their higher quality product outside of Costa Rica for lack of adequate compensation from his company, his response was that the company would simply have to import more cacao. Similar to Costa Rica, there is no price incentive for higher quality cacao beans in Guatemala or Honduras.

Regardless of the lack of incentive for better quality cacao beans, it is reasonably clear that there is a market for the cacao beans being produced in Talamanca. A marketing system exists, and the world-wide demand for cacao, especially in developed countries, is growing. The situation is not as clear for other products being produced in the Talamanca agroforestry systems (with the possible exception of black pepper). The marketing systems are largely nonexistent and will have to be developed. Consumer demand, especially for products which command little consumer awareness either in Costa Rica or the export market, will have to be carefully assessed before large investments should be made in processing or other postharvest handling systems.

Conclusions and Recommendations

The ANAI Agroforestry Project is an impressive example of what the commitment of a few people can do for the development of a sizeable area of land, in this case the Canton of Talamanca. ANAI, as the planner and manager of the project, has started a process of economic development based on ecological management of the land and relatively non-intrusive social change. The results are positive, but the planned new socio-economic system is a long way from being self-supporting.

The ANAI Agroforestry Project is at a critical juncture in its development. It is about to embark on the complicated and costly postharvest handling and marketing phase of the project, while at the same time having to maintain and upgrade ongoing nursery and farm production activities. It is requesting money and support from USAID/Costa Rica and ATI/Costa Rica to help implement this new phase.

Considering the fact that the goals of the project are consistent with USAID/Costa Rica NTAE and ATI/Costa Rica programs, and that ANAI has demonstrated its ability to successfully manage the project, it is the recommendation of this consultant that USAID/Costa Rica and ATI/Costa Rica support the project to the fullest extent.

The following are specific conclusions and recommendations for support of the project:

1. Nurseries and production improvements. The 23 community nurseries have been an important tool in the successful organization of the communities and have also led to significant improvements in agricultural production. Even though community organization activities will be refocused to the postharvest centers in the next phase of the project, efforts should be made to maintain the nurseries and production improvement activities to insure that they become integrated into the functioning of the communities and the region. It is recommended that ACORDE continue funding these activities, based on a plan by ANAI to privatize the nurseries and integrate the production development into the Costa Rican agricultural research and extension system.

2. Information/data collection system. The success of the ANAI Agroforestry Project has largely been the result of the knowledge and commitment of the members of ANAI. As the project continues to grow, the information needed to make appropriate decisions about inputs and directions is going to increase and will have to rely on more than the capabilities of ANAI. This short assessment has identified needs to monitor and evaluate certain aspects of the macro-environment, and to collect the production and market information for feasibility studies of the commodities being considered.

It is recommended that the need for increased information and data be explicitly recognized within the project and that the project begin to introduce an information collection, organization and analysis system. The commodity system methodology used by the PIP consultant for this assessment is one such information collection and management system which has been designed for use in developing countries and could be easily introduced to Talamanca.

3. Cacao fermentation. In the region visited, it is recognized that cacao beans need to be fermented in order to produce quality cacao, but the exact knowledge of how or the length of time to ferment the beans is lacking. It is recommended that the project solicit technical or adaptive research assistance to determine the proper fermentation procedures.
4. Cacao drying. In contrast to cacao fermentation, the procedures for cacao drying are relatively well appreciated, but the technology could be improved. There is an anticipated need to minimize drying labor because labor demands will increase for production,

harvesting, and processing of other commodities in the agroforestry system. Labor efficient and multiple use dryers would be highly desirable. It is recommended that the project engage the services of an engineer to redesign the dryers to incorporate the best features of the solar and Samoan dryers, to increase their manageability, and to allow their use for cacao, black pepper, leafy spices, root spices, and other commodities as appropriate. It is also recommended that the project conduct a feasibility study on the scale of the dryers needed in relation to the amount of the commodities to be produced, in what times of the year, and the prospective markets for the commodities.

5. Black pepper and spice drying. The ANAI Agroforestry Project expects to be producing black pepper and other dried spices for the export market. To date, there is not adequate information about the amount of these commodities which will be available for drying. It is clear, however, that the potential to increase production is immense should markets be available. It is recommended, as in (4) above, that dryers be designed which would be suitable for drying cacao, black pepper, and other spices. In addition, a feasibility study is needed on the potential markets available for the spices that could be grown, including the economics of production and processing in the Talamanca area.

6. Processing of acid tropical fruits. Of the million or so trees planted on farms in the Talamanca area, 20 - 30% of them are various species of tropical fruit trees. While some of the fruit could be sold fresh, the project goal is to establish a local processing plant to extract and freeze the juices of the various fruits for marketing in Costa Rica and for export.

Clearly, more information is needed on the potential production of the various fruits, and a feasibility study should be done which relates the potential production to costs of building and operating a processing plant for the potential markets. To be economical, a plant will require a minimum amount of raw product to be processed, meaning that the project will have to produce more of several of the fruits species which have the greatest market potential. Until such time as production increases enough to support an economically viable processing plant, the Talamanca area will probably have to sell the fresh fruit on the domestic market.

7. Management skills training. The single most important factor for economic development of a company, a region such as Talamanca, or a country, is change and improvement in management skills. The ANAI Agroforestry Project intends to dramatically alter the economic activity of the Talamanca area. The most important factor which will contribute to the success of the proposed activities will be the development of appropriate and sufficient management skills among the population. Regardless of how one views the management of the existing economic system, new management skills must be developed for the new technologies (such as the above recommended postharvest technologies) and economic systems that are being introduced. It is recommended that ANAI devote the majority of its development activity and funding to management training.

8. Marketing. Well developed markets exist for cacao, while markets for the other products to be produced in the ANAI Agroforestry Project have yet to be developed. Existing markets for cacao do not pay for quality,

which will be a constraint in the development of a quality conscious industry.

It is suggested that ANAI investigate the market development and information systems being implemented by the USAID/ROCAP Non-Traditional Agriculture Export Support Project. As in (7) above, development of marketing skills should be a high priority. Clearly, marketing feasibility studies need to be done for every product being considered for the area. While Talamanca develops its own internal marketing skills and information systems, it should rely as much as possible on existing marketing systems in Costa Rica whenever they offer the opportunity for acceptable profit with a more limited risk.

USAID/COSTA RICA NORTHERN ZONE PROJECT

Background

The USAID/Costa Rica funded Northern Zone Project is located in the Canton of Upala in the north of Costa Rica on the border with Nicaragua. Primarily, the project is involved in the development of infrastructure and the settlement of landless campesinos on small tracts of land. In order to fully realize the potential of these two investments, the Government of Costa Rica (GoCR) and USAID are promoting economic development in the area. The Northern Zone Project is scheduled to be continued with a reorientation (consolidation) of project activities to build on those completed and meet the economic development goals of the GoCR. Export of non-traditional agricultural (NTAE) crops is one of the development goals of the GoCR and USAID. This report evaluates progress and recommends activities for the development of NTAE in the project area.

The Northern Zone Project area in the Canton of Upala occupies a narrow piece of land along the Nicaraguan border, immediately to the south of Lake Nicaragua. The project area begins a short distance south of the recognized border and includes most of the lowlands southward to the beginning of the major uplands of the Cordillera de Guanacaste to the southwest. To the east, the project area is bounded by the swamps extending south from Lake Nicaragua.

The climate is humid and tropical, with precipitation greater than 2000 mm/year, and usually having a marked dry season in the first three or four months of the calendar year. Mean annual temperature is between 70 and 80 degrees Fahrenheit, with relatively small diurnal fluctuations. Physiography ranges from swampy, to intermittent swamps

along the rivers, river flood plains, alluvial plains, low rolling hills, to the foothills of the Cordillera de Guanacaste. The soils in the project area are fairly rich, being dominated by thick deposits of nutrient rich volcanic ash, presumably from the Cordillera de Guanacaste immediately to the southwest. While the soils do have some nutrient limitations, especially in the case of phosphorus fixation, the major limitations to productivity in the area are related to intermittent high water tables in lowlands with less than 5% slopes, and a high potential for erosion in hilly lands with greater than 15% slopes.

Historically, the area was populated by two distinct groups. One group from Nicaragua traveled up the rivers from Lake Nicaragua and established communities such as Upala and Watuso at the upper limits of easy navigability of the rivers. Their main economic activities centered around extraction of resources from the rivers and forests, cacao production, and small scale farming. The second group were Costa Ricans who moved across the passes from Guanacaste to the southwest to establish cattle ranches in the eastern foothills of the Cordillera de Guanacaste. Even though the two social groups met along a rather ill-defined boundary, their contacts and economic relations with the rest of the world were through their parent communities, with little interaction between the two groups. Even today, the areas of the two groups are generally recognizable based on economic activity -- the cattle ranchers have large tracts of land which have been converted to grasslands, while the farmers have much smaller tracts of lands with a greater diversity of crops and vegetation.

The Northern Zone Project (NZP) area encompasses these two groups of people, and has the goal of welding them into a single socio-economic-political entity. Given the conflictive nature of the Nicaraguan government to the

north, the GoCR and USAID consider it important to better integrate these communities into the Costa Rican body politic. In addition, the project is acquiring large tracts of land in the area, surveying it, laying out small farms, roads, and communities, and settling these lands with heretofore landless campesinos, some of whom are refugees from the Nicaraguan conflict. These new settlers as well will have to be integrated into the cantonal community.

The Canton of Upala is also one of the most remote and underdeveloped areas in Costa Rica. The situation is changing rapidly as the result of activities of the NZP whereby a system of roads and bridges is being constructed to provide easy access to all of the region and will connect it to the rest of Costa Rica via Liberia to the southwest, La Cruz to the northwest, and San Carlos to the southeast. In addition to the road system, the national electricity grid is being extended into the region, and telephone service for the area is planned.

The NZP is under the overall coordination of the Costa Rican Ministry of Planning with three major areas of operation -- land settlement and titling, infrastructure development, and economic activity (primarily agricultural) diversification. The USAID Project Officer working with the project and living in Upala is Mr. Harry Peacock, who kindly escorted Mr. Dechert on a tour of the project area, and provided most of the information for this report. (However, the opinions contained in this report, as well as any errors in reporting of information received from Mr. Peacock and others, are the sole responsibility of the consultant.) Other Costa Rican agencies involved in the project are: the Ministry of Agriculture for agricultural production and diversification in the area; the Ministry of Public Transportation (MOPT) for the development and maintenance of roads; and DINEDECO for community development in terms of schools, community

water systems, meeting places, and other infrastructural improvements.

Northern Zone Project Accomplishments

The NZP is nearing completion of its original mandate from USAID and the GoCR. USAID and the GoCR are planning a second phase of the project -- a "consolidation" phase to build on the initial efforts. The second phase will concentrate on the economic development of the area to support the settlers and infrastructure which have been put in place by the first phase. Some of the activities of the first phase will have to be maintained by outside support until phase two produces sufficient economic activity to maintain them from within the region.

This report does not address the major accomplishments of the project, i.e., those of road construction, community development, and land settlement, except to note that the consultant was positively impressed with the results he saw. Comments in this report are confined to the crop diversification aspects of the project, especially as this relates to NTAE, and should be considered in relation to the major accomplishments of the project.

In contrast to the ANAI project, where a crop diversification and economic development project was being implemented before major infrastructural inputs came to the area (which may in the end require significant adjustments in the economic development plan by ANAI), the NZP has made major infrastructural and social inputs and now must develop an economy which can support it.

Crop diversification, especially for NTAE crops, is not much in evidence in the NZP area. Some cacao plantations are being upgraded using the CATIE package, while many others

are still overgrown by weedy natural vegetation. One farm visited is experimenting with black pepper and has plans to expand. Vanilla is another crop which is reportedly being tested in the area. Nurseries visited contained cacao, citrus, and macademia (which is not particularly suited to tropical lowlands). The new settlers, on clear-cut and burned over lands, are planting upland rice, beans, and corn, along with some perennial tree crops which might have potential as NTAE crops if they were part of a marketing plan. The lowlands and river floodplains, where cleared, managed, and controlled from flooding or swampiness, are large rice fields. Rice, while not considered a NTAE crop, is increasing in area and yields and represents a reasonable income potential for the area. The large cattle ranches with their rich soils and abundant rainfall have potential for conversion to more intensive animal husbandry or other types of agriculture and are of sufficient size to provide volume for export once a viable export activity has been developed in the region.

Consultant Assessment of the Northern Zone Project

June 6 - 8, the PIP consultant travelled to the Canton of Upala to meet with Mr. Harry Peacock, the USAID Northern Zone Project Coordinator, Costa Rican officials working on the project, and various community members. The consultant visited many agricultural production areas, attended two community meetings, visited with community members, met briefly with the Acting Project Director from the Ministry of Planning, observed nurseries, toured one of the land settlement areas and saw others being set up, and developed an overview of the project.

The consultant was impressed by Mr. Peacock's good relations with the different community members and organizations. In terms of community organization and development and the

progress of the NZP in general, Mr. Peacock is an important force. His ability to channel community meetings in a positive direction by getting the members to think through ideas and projects is remarkable. Mr. Peacock's ability to persuade community members to think about larger questions and goals within the NZP is an asset that should be fully appreciated by USAID and the GoCR. The project is fortunate to have a man of his capabilities on-site -- a man who takes the complexity of community development to a reality which individuals can appreciate.

Regarding the necessary economic development, community development activities should be refocused from adjusting to settlement and infrastructural inputs to developing individual and organizational activities which will result in income to the area. In terms of developing income from NTAE, the following are activities which should be considered in this effort.

A. The Macro-environment

The consultant attended community meetings and visited community leaders who were asking questions about how economic development in the region is going to be organized -- what crops or commodities are going to be emphasized and supported by GoCR programs. They understand that there must be a government support plan before they should risk investments in economic enterprises because, as experience in other regions of Costa Rica has demonstrated, the presence or absence of government support can make or break economic enterprises. This is especially true with NTAE crops.

In comparison to the ANAI project, the NZP appears to lack an economic development plan specific for the region under consideration. Even though the ANAI project does not have a

written or government sanctioned economic development plan, project personnel and the community have a clear idea of the economic base they are trying to develop. In the NZP, such plans or ideas are not at all clear, except perhaps for the cattle ranchers who plan to continue with their economic activities. Certainly for the new settlers, a plan for economic development with some help from the GoCR would be most welcome; and yet there is very little evidence of action in this direction.

Most of the information and inputs necessary to make an economic development plan are in place. Reports are on file presenting the physical environmental situation of the region, and therefore, its capability for different crops and cropping systems can be ascertained. There are three major types of farming systems in the area -- the ranchers, the traditional small holders, and the new settler small holders -- as well as government held forest lands. The GoCR has established a national priority for the development of NTAE, which is supported by USAID and other programs. The Upala Cantonal communities are now organized, accessible, and are considering what economic activities they would like to develop. The missing link is a government plan committing it to a rational set of economic activities for the development of this region.

People involved with the NZP are aware that the primary responsibility for the development of a plan for the area rests with the Ministry of Planning, which is the coordinating agency for the project. The Ministry of Planning has not been able to establish a permanent and satisfactory management team for the project, which has led directly to its inability to sustain the long-term effort of developing a plan.

The Ministry of Agriculture has approximately two dozen personnel in place who are working on several agricultural development programs, including NTAE crops. The assumption must be made that economic development for the region in the foreseeable future will be agricultural development. Unfortunately, there is a lack of coordination for these activities within the Ministry of Planning. The Ministry of Agriculture appears to have committed a reasonable amount of resources to facilitate the development of the area, in terms of research and extension services, planting materials, and manpower. These activities would be enhanced through better coordination and planning with other ministries and USAID.

The Ministry of Public Transportation (MOPT) and DINEDECO have also committed reasonable resources to the project. They have been heavily involved in the progress of the project, the results of which are quite visible in the region. The MOPT undoubtedly will have much less of a role in the consolidation project, being limited primarily to maintaining, correcting, and upgrading the road projects completed until they can be supported, at least in part, by the local communities. MOPT should have a role in helping the communities establish standards for use and maintenance of the major roads, and could contribute much to improving the poorer design and construction of the roads into the new settlement areas. The improved agricultural production and processing, envisaged for the next stage of the project, will require continued improvement in the road systems.

DINEDECO, on the other hand, expects to continue with development projects in the area as the economic welfare of the communities increases. One concern is that the communities have received large inputs from the GoCR and USAID, and may tend to think that infrastructural improvements need not be tied to economic development to pay

for them. At some point, plans for further development of the NZP should include a switch in emphasis from infrastructural development to economic development as the primary goal, with infrastructure developed for and supported by the economic development.

The Upala area has been changed by the NZP project, and changes in the communities are probably going to continue at a fairly rapid pace, especially if the consolidation project is implemented. These changes are being driven by new roads and settlers in the area, other new infrastructure, new money from the project, new social and economic interactions at all levels and among all social groups, government development program inputs, and the political instability along the border with Nicaragua. Mr. Peacock has been instrumental in facilitating the social awareness necessary for individuals and communities to adjust to these changes.

As with the ANAI project, the success of the NZP project is strongly dependent on the facilitating role of the expatriot working with the project. And, as with the conclusions for the ANAI project, the long-term success of the NZP will depend on careful monitoring of social development in the communities and husbanding social development independent of Mr. Peacock. It is not clear that the original NZP design gave sufficient consideration to the social evolution that would result from the project. Considering the complex social evolution and economic development that is expected for the area, and the goal of it becoming self-supporting, the consolidation project must consider the social-economic development program very carefully.

In relation to the development of NTAE crops, especially in the case of the new settlers, adequate social and financial services will be needed to help farmers develop viable economic activities. Financing and credit will have to be

made available for the terms necessary to grow, process and market agricultural products. If the economic development plan for the area is oriented to cacao and other NTAE tree crops, the settlers will have to be recipients of long-term support until they can realize an income from these crops.

In addition to services supplied by government and private organizations, Costa Rica has a history of agricultural development based on farmers organizing into cooperatives. The Cooperative at San Carlos, not far to the southeast of Upala, provides a good model of a farmers' organization for production, processing, and marketing of cacao. Loose associations of the ranchers from Guanacaste and small farmers from Nicaragua exist, but better organized farmers' associations will have to develop to facilitate farmers' responses to the international marketing requirements of NTAE crops. Similar to the ANAI project area, farmers in the NZP will have to associate into much more coherent entities in order to produce for international markets. One advantage of the new settlers may be that, given their need to develop an operational base, they may be more flexible in overcoming social habits to meet the market demands.

B. Production

Increased production of agricultural, and especially NTAE, crops has been a goal of the NZP. Primary emphasis, however, has been placed on the development of infrastructure resulting in less emphasis on agriculture. USAID is constrained from contributing to the development of major agricultural commodities which might compete directly with U.S. agricultural industries, but the GoCR Ministry of Agriculture has developed an active program in the NZP area. Production of major agricultural crops is increasing, especially rice. Considering that the NZP area does in fact have the potential for extensive production of commodities

such as cattle or rice, and that population pressure in the area is not great, the economic development plan for the area should give consideration to these activities for income generation.

Production of NTAE crops must be considered to be in its infancy at best. Individuals and communities are interested in developing new economic activities, mainly with NTAE crops, and the project should build on this interest. The danger, given the small area of NTAE crops actually grown in the area, is that the development plan will overemphasize the potential of NTAE at the expense of traditional crops in the short-term economic development of the region.

Especially in the case of the new settlers, they may not be able to generate adequate incomes from their small pieces of land until some of the tree crops begin to produce, and until then they will need to rely on salary income from other larger economic activities in the area. Therefore, the consolidation project should apply a reasonable proportion of inputs for the continued development of traditional agriculture to provide immediate income to the area.

For the longer term development of NTAE, the first priority should be the identification of the crops which will be emphasized. Understandably, cacao will be one of these crops since extensive plantations already exist which can be refurbished using the CATIE package of inputs. For other crops, such as black pepper, vanilla, and tree fruits, given the low level of understanding of export economics in the NZP area, the GoCR and/or USAID will have to provide inputs on market potentials -- which NTAE crops are more likely to be produced in sufficient quantity and quality to satisfy the market. Presumably, once these decisions have been made, planning can begin for production areas, government and farmers organizations, funding, planting materials, and

nurseries. Production packages for the crops can be developed and extended to the various types of farmers and farmers' organizations in the area. Without the coordinated efforts that result from a well implemented plan, development of NTAE in the area will be much slower and less dependable as an economic base for other community activities.

Compared to the ANAI project where community development has been centered around agroforestry production, development in the NZP has been centered around the introduction of infrastructure. The NZP now must plan for economic activities to support the infrastructure, and NTAE are identified as some of the economic activities. The NTAE plan must identify appropriate varieties, proper growing conditions, adequate production, etc., to insure processing and/or marketing quantities and qualities. The production should be planned to meet market requirements which will better ensure economic returns on the investments. The ANAI project runs the risk of having invested in the production of a number of commodities which will never produce an economic return, since it is not known whether markets exist or what are the requirements. The NZP has the opportunity to first identify markets and market requirements and plan production to meet them.

C. Postharvest Handling

For the postharvest handling of cacao and black pepper, similar things can be said for the NZP as were noted for the ANAI project. The primary difference has to do with the fact that production in the NZP is not well organized and fermenting and drying take place on a smaller, more informal scale. As production increases, and especially if Upala adopts the quality standards of the San Carlos Cooperative, the area will need much the same inputs as Talamanca. In

fact, it seems reasonable to consider the needs of the small farmers in Upala in any redesign of the cacao and black pepper dryers. Upala appears likely to have a shortage of firewood, given the pace of logging and land clearing, so that artificial dryers may have to rely on other energy sources.

In terms of project needs, what was noted above about production being dictated by market requirements is perhaps more true for postharvest handling. Within the development plan for the NZP, postharvest handling needs of NTAE should be identified as a function of the potential markets. For all NTAE crops, except perhaps cacao, the development plan should provide for postharvest handling as an integral part of establishing the priority commodities for the identified markets.

D. Markets

The critical questions to be answered for the consolidation of the NZP are, "What foreign markets exist for non-traditional commodities which can be grown in the Upala area?" and "Which of these commodities offer the best potential for a good return on the production and postharvest handling investment?" It is possible that the GoCR and USAID have answered these questions to the extent that they can be, in which case a development plan for the NZP should be easy to put together. The ROCAP Non-Traditional Agricultural Export Support Project should have some of the answers to these questions. Wherever this type of information is being generated and however these decisions are being made within the GoCR, it is beyond the capabilities of most of the residents of the area to be able to pull the information together. It is not reasonable for the GoCR or USAID to expect individuals from a remote and poorly organized area to be able to determine market

conditions and make individual investments to produce for those markets. It is the responsibility of the government institutions to see that this information is available to the farmers, in a format that will convince them that their investments will be returned, before the farmers can be expected to plant NTAE crops in quantities sufficient to access foreign markets.

It is recognized that these types of information and decisions can never be given with 100% certainty. However, a major financial risk is being asked of very poor farmers and new settlers. They need the assurance that the government will support their investments in NTAE crops through adequate programs and services. This should be the primary goal of the NZP consolidation project.

Recommendations

The NZP has made considerable progress in the development of the Canton of Upala into a viable sector of twentieth century Costa Rica. Major accomplishments have been in the areas of land settlement and titling, road construction, community organization, and community infrastructure development. A "consolidation" phase for the project is being planned by USAID and the GoCR. The following are recommendations for activities in the second phase which would support the development of NTAE:

1. Change NZP focus from infrastructure development to economic activity development. The communities of the Canton of Upala have been strongly impacted by the construction of roads and bridges in the area, allowing transportation beyond anything attainable only a few years ago. In addition, settlement areas have been developed, introducing new individuals and economic activities to the society. The focus of the NZP has

been to help the communities adjust to these changes. However, if these changes are going to be sustained, the NZP will have to focus on helping the communities develop viable economic activities, especially in agriculture.

2. Development plan for the Canton of Upala. The NZP is buzzing with activity, and the evidence is abundant that a multitude of changes have occurred in the last few years. However, for all of this activity, there is no overall economic development plan for the area. The activities resulted from the need to open the area to access from the rest of Costa Rica. The Ministry of Planning should make a priority effort to produce an economic development plan for the area which will have the full support of the policies and services of the GoCR. Further activities to develop and stabilize the area will be inefficient in the absence of such a plan. The economic development plan should be based on agricultural development and must consider both traditional and non-traditional crops, recognizing that traditional crops will provide the majority of short-term income to the region.
3. Plan for priority NTAE crops. The economic development plan must identify the NTAE crops and postharvest activities which are considered to have the greatest potential viability for the area. This will allow the Ministry of Agriculture to better focus and coordinate development activities. It will also provide valuable assurance to the farmers that the GoCR supports their investments in the development of NTAE.
4. Development of institutions and skills to support NTAE. A number of organizations and management skills need to be developed in the region to support NTAE. The exact

nature and structure of these institutions and skills is beyond the scope of this report, but they should include such things as farmers' production and marketing organizations; market information systems; research and extension on the NTAE crops from the Ministry of Agriculture; management skills for postharvest handling, processing, and marketing; and small farm management. USAID should take care in assuring that organizational development and management training is fully transferred to the Costa Ricans.

5. Available credit. The small farmers and agroindustries need the full support of easily available credit if they are to be able to develop the production and postharvest handling of NTAE crops.

6. Cacao production, postharvest handling, and marketing. Cacao is the NTAE crop most evident in the area, even though many of the plantations still need to be upgraded using the CATIE package. Assuming that cacao production will continue to increase, and that the small holders in the area will diversify their crops to minimize risk, the recommended redesign of the cacao/black pepper/spices/etc. dryer for the Talamanca area might be considered for this area as well. The Upala area is well situated to associate itself with the San Carlos Cooperative to market high quality cacao.

7. Market determination of NTAE crop production and processing. Considering that there is very little production or handling of NTAE crops in the area, except for cacao, the decisions for the crops to be produced, the amount and quality, and how they are to be handled or processed should be determined by market

need. The GoCR should plan and encourage the development of NTAE crops for the identified markets.

8. Develop sources of market information. If a significant proportion of regional income is to be from NTAE, the project should require considerable inputs for the development of a market information system for the region. Two possibilities are the GoCR Ministry of Agriculture, or the ROCAP Non-traditional Agricultural Export Support Project.

9. Development of management skills. As economic development of the region proceeds, especially in the area of quality and quantity to meet export markets, the project must consider a major input for the development of local management skills. The development of new management skills will be required for government support services, farm management, postharvest handling and processing, and marketing. Similarly, social change resulting from the economic development will require new skills which the project should monitor for progress and facilitate where necessary.

CONCLUDING COMMENTS

Both the ANAI Agroforestry Project and the Northern Zone Project have the ultimate goal of rural development based on agroindustry for two of the poorest regions of Costa Rica. They have taken different paths to begin the development process, but in the end will have to ensure that a number of very similar components essential for the development of agroindustries have been introduced. One could argue that the short-term goals for initiating the projects justified

the more limited inputs; however, long-term stability of the desired NTAE industries will require the full range of inputs. The issue for the redesign of both of the projects is to ensure that all of the inputs will be forthcoming from one source or another.

It is interesting to contrast the approaches of the two projects. The ANAI project developed production of agroforestry products, in spite of the absence of infrastructure in the region, with the goal of overcoming these limitations to economic development. They have been fortunate in having the infrastructure provided by the GoCR just when it will prove a real advantage to them. In the case of the NZP, the development of infrastructure has preceded the new economic development, although it must be pointed out that the pre-project economic level of the Upala area was higher than in Talamanca. The NZP now has a fairly well developed infrastructure as well as new settlers and needs an economic base to support them.

A better agricultural production data base would be needed to compare the two project areas, but on the surface they appear to have many similar needs for their continued economic progress with NTAE. Both projects have organized their communities based on adapting to changes introduced by outside organizations but now need to refocus community organization to facilitate development driven by internal social and economic needs. Economic development plans for both areas need to be explicitly spelled out by the GoCR, ANAI, and USAID so that individuals and organizations within the communities can make decisions about their roles in these plans. Local participation in the plans will have to be facilitated by the outside organizations, but should be driven by expressed community needs.

The role of the Ministry of Agriculture will be critical to the continued development of NTAE in the two regions. In the NZP, the Ministry of Agriculture has committed resources but needs to be more coordinated and aggressive in the development of NTAE. In Talamanca, ANAI could afford to rely more heavily on the Ministry of Agriculture for production inputs to release ANAI's scarce resources for postharvest handling and marketing. NTAE can become a viable long term industry for Costa Rica only if the Ministry of Agriculture is fully involved with every step in its development. They have vital roles to play in the areas of information management, research, extension, national prioritization, and planning. Both projects face the same task of better integrating their activities with those of the various ministries of the GoCR.

Both project areas are poised to launch into postharvest handling and marketing of NTAE crops being produced in the areas and both face the whole series of interrelated tasks of moving products from harvest, through various processing and handling channels, to viable markets. Costa Rica has a good record of moving agricultural products into international marketing channels; however, the Upala and Talamanca communities will still require considerable education and facilitation to be able to develop their own postharvest industries, market information systems, marketing channels, and general social awareness for international marketing. The long-term economic viability of NTAE from the areas will be dependent on the development of organizations to identify markets, facilitate production for the identified markets, insure proper postharvest handling and quality control, and move the product to a primary market. The organizations will have to be managed by well-trained and motivated individuals who have the best interests of Costa Rica and the two areas in mind.

ANNEX I

ANAI AGROFORESTRY PROJECT
Apartado 902 Limon
7300 Costa Rica
Tel. 24-60-90

ACCOMPLISHMENTS, 1984 - 1986

QUANTITATIVE ACCOMPLISHMENTS:

25 community nurseries established.

Approximately 1 million trees produced and planted on the farms of 1,200 small farmers.

about 70% cacao;

about 20% divided among guanabana, coconut, rambutan, annatto, grafted citrus, nutmeg, and pejibaye;

about 5% reforestation trees;

and the remaining 5% divided among about 80 species of perennial subsistence crops.

Approximately 1,000 hectares planted.

Reproduction gardens of medicinal plants established in each of the 25 nurseries.

Number of direct project participants: 1,200

ORGANIZATIONAL ACCOMPLISHMENTS:

Formation of 25 community agroforestry groups.

Formation of a regional group representing the 25 communities, which meets bi-monthly.

Formation of a representative commission to study marketing.

Dialogue between community agroforestry groups, the marketing commission and local cooperatives.

Formation of the Association of Small Reforesters of Talamanca (APRETA), representing the farmers of all the community agroforestry groups.

Courses in formation and management of cooperatives given by INFOCOOP to participating farmers.

EDUCATIONAL ACCOMPLISHMENTS

Practical education in the community nurseries (nursery management, proper handling of agrochemicals, soils, production techniques for more than 80 species).

Three bulletins produced especially for Talamanca farmers:

1. Annatto
2. Pejibaye
3. Appropriate planting distances and other basic information on all of the crops being planted in the community nurseries.

Training and practice in budding, grafting, air layering, and propagation by cuttings.

Group visits to established farms.

Talks on cacao and achiote for participating farmers and students of the Agricultural High School of Talamanca, given by Drs. Alfredo Paredes and Jorge Ardce of CATIE.

Practical experience in the management of new and established cacao plantations, and the establishment of plantations of various species.

A one week course in cacao for ANAI extension personnel, at CATIE.

A three day course in achiote for ANAI extension personnel, at CAITE.

A year-long course in forest tree management and nursery practices for ANAI extension personnel, at CATIE.

A one week course in grafting for ANAI extension personnel, at the Fabio Baudrit experiment station (Ministry of Agriculture).

A demonstration of non-traditional crops at the Farmers' Day at the Talamanca Agricultural High School.

Study and planting of demonstration plots at the Talamanca Agricultural High School.

ACCOMPLISHMENTS: GENETIC IMPROVEMENT

Practical experience in grafting, in the community nurseries.

Identification and collection of superior genetic material within Costa Rica.

Collaboration with CAITE and the Fabio Baudrit station in the importation and propagation of selected germ plasm.

Importation of vegetative material and seed from Florida, Hawaii, Colombia, Ecuador, Honduras, Brazil, and Asia.

A three month study and plant collection trip by agronomist Peter Aspinall to Thailand, Malaysia, Singapore, and Australia.

ACCOMPLISHMENTS: PROCESSING AND MARKETING

Regional organization for processing and marketing.

Practical experience with turmeric: cultivation, harvesting, washing, transport, drying and marketing.

Initiation of a dialogue between the cooperatives and the nursery groups.

Internal study of the statutes of COOPETALAMANCA with respect to marketing.

Course in agricultural marketing with a view toward direct exportation by the agroforestry groups, given by ADIAME.

Course in processing and marketing, for ANAI and COOPETLAMANCA extension personnel, given by the Spanish mission in Costa Rica.

A three day hands-on course in the construction of solar driers for representatives of all the agroforestry groups, given by ICAITI.

Course in agro-industrial preparation of crops for exportation, given to representatives of the agroforestry groups by ICAITI, with assistance from ANAI project personnel.

ANNEX II

ANAI AGROFORESTRY PROJECT

GOALS: 1986 - 1988

PRODUCTION GOALS

2 million trees planted.

2,000 hectares planted.

A garden of medicinal plants in the home of each participant.

EDUCATIONAL GOALS

Establishment of two educational and training farms for the direct training of the project's farmers.

Produce technical bulletins on cacao, rambutan, guanabana (sour sop), nutmeg, citrus, medicinal plants, soil conservation, nursery management and other topics.

Direct training of farmers by means of:

- a. Visits to farms by agronomists and by the nursery groups.
- b. Lectures.
- c. Practical experience in the nurseries and demonstration plots.
- d. Monthly practical training for 500 farmers on the training farms.

Training of one local extension agent in each community.

Program of studies on guanabana, black pepper, and casha in conjunction with students of the Talamanca Agricultural High School.

Establishment of a scholarship program for graduating high-school students.

Cassette Forum program (a method of improving communication between project participants and the institutions and individuals representing them regionally).

ORGANIZATIONAL GOALS

Consolidate the 25 community agroforestry groups, with a view to future needs in marketing and education. These groups will not necessarily be limited to participants in the ANAI project.

Integration of community groups into the regional cooperatives.

Consolidation of the Association of Small Reforesters of Talamanca (APRETA) as the principal representative of the interests of the small farmers of Talamanca with regard to the forestry sector.

PROCESSING AND MARKETING GOALS

Integration of Talamanca farmers into marketing cooperatives.

Begin to establish a processing infrastructure at the community level; collection centers, processing plants (fermenters, dryers), and warehouses.

Begin to train farmers in technical, accounting and organizational skill to be able to manage these businesses.

Establish a processing and marketing infrastructure on the regional level.

Train representatives of the local cooperatives in technical, accounting and organizational skills to be able to manage the cooperatives and carry out direct exportation of products.

Establish contacts and cooperation between Talamancan cooperative groups and technical and financial aid institutions.

GOALS IN GENETIC IMPROVEMENT

Continue to train farmers in asexual propagation techniques (grafting, air layering, and cuttings) with a wide range of fruit, nut and spice crops.

Import into Costa Rica and propagate varieties selected for high quality, high productivity and/or disease resistance of the following promising species:

rambutan, durian, pulasan, carambola, Colombian zapote, canistel, jackfruit, jaboticaba and sapodilla.

Continue searching for high quality native lumber and fruit trees of species existing in Costa Rica. Example fruits: (Sapote, Guanabana, Nance, Caimito, Rambutan).

Continue importing into Costa Rica and establishing on small farms species of high commercial potential which still do not exist in quantity in the country, e.g., mangosteen, lansium, champedak, salak, acai, buriti, borojo, inchi (Orinoconut), uvilla (Amazon grape), jaboticaba, pili nut and others.

FINANCIAL GOALS

Design a loan project appropriate to the technical, socio-cultural, educational, and financial conditions of the small farmers of Talamanca; and assist the regional institutions that would manage a loan program.

Train the farmers to apply for and manage loans.

LIVESTOCK GOAL

Introduce a reproducing flock of blackbelly hair sheep into each community in Talamanca.