

**SMALL FARMERS AND THE TRANSITION TO NON-
TRADITIONAL AGRICULTURE IN
GUANACASTE, COSTA RICA**

by

Carmen Álvarez Torres

B.A. Political Science
Universidad de Costa Rica - San José
(1995)

Submitted to the Department of Urban Studies and Planning in Partial
Fulfillment of the Requirements
for the Degree of

MASTER IN CITY PLANNING

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1997

© 1997, Carmen Álvarez Torres

The author hereby grants to MIT permission to reproduce and to distribute publicly
paper and electronic copies of this thesis document in whole or in part.

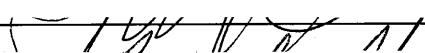
Signature of Author



Department of Urban Studies and Planning

May 22, 1997

Certified by



Professor Alice Amsden
Thesis Supervisor

Accepted by



Associate

Professor Mark Schuster
Chair, Master in City Planning Committee
Department of Urban Studies and Planning

UNIVERSITY MICROFILMS
MICROFORMS

JUN 25 1997

ACKNOWLEDGMENTS

In the process of this study, many people provided me with support, guidance, and indispensable criticism. First, I have to thank the people in the regional office of the Ministry of Agriculture and Livestock of Liberia, who gave me their support and friendship during the months when I did my field research. The assistance of Bernardo Jaen, the Director of Special Projects and Research of Liberia, was of particular value for my investigation. Many thanks for letting me search through his files many times and having the patience to answer my questions over and over again. In the same way, I have to thank Mario Navarro also from the MAG in Liberia, who gave me his time and company when I had to interview farmers in remote places. I am also grateful to the extension agents in Bagaces, Carrillo, La Cruz, and Santa Cruz, and to all the people in the regional offices of the MAG in Guanacaste, and the managers of ACIAR, ODRES, and PROPICA. Without their help, my progress would have been very slow. My uttermost gratitude and affection to my friend Gerardo Loaiciga, who had the patience to put up with me and listen to endless accounts of interviews, anecdotes, and many reformulations of research questions and study focuses. Thank you for bringing me back to my basic questions every time that I veered away. I am also indebted to Don Antonio Loaiciga, from the Hacienda El Pelón de la Bajura, for providing valuable insights into the nuances of the agrarian structure in Guanacaste and the idiosyncrasy of the Guanacastecan people, and also for always giving me his warmth and friendship. My biggest gratitude goes to the producers who answered my questions and spent precious hours discussing their experiences. Finally, I would like to express my deepest gratitude to Professor Judith Tendler, for commenting profusely on my proposal and thesis draft, and providing invaluable insights for my study.

Table of Contents

Chapter

| | | |
|----|--|----|
| 1. | INTRODUCTION..... | 2 |
| | Methodology..... | 15 |
| 2. | THE STATE MODELS FOR RURAL DEVELOPMENT AND THE AGRARIAN STRUCTURE IN GUANACASTE..... | 18 |
| | The Agrarian Structure in Guanacaste | 19 |
| | Public Sector Institutions and Agricultural Development..... | 21 |
| | The MAG Extension Agents and the New Type of Projects..... | 23 |
| 3. | TRADITIONAL AGRICULTURE AND SMALL RICE FARMERS..... | 27 |
| | Tenure Patterns and Uses of Land..... | 28 |
| | Farming Methods Among Small Farmers..... | 30 |
| | The Commercialization of Basic Grains..... | 31 |
| | Problems with Traditional Agriculture..... | 32 |
| | Technical Assistance and the Transfer of Technology..... | 33 |
| | Cooperation Between Large Rice Haciendas and Small Farmers: The Case of El Pelón and Two Agrarian Reform Settlements..... | 34 |
| | Conclusions..... | 37 |
| 4. | THE SEARCH FOR NON-TRADITIONAL EXPORT CROPS AND THE DESIGN OF THE CAYENNE PEPPER PROJECT..... | 40 |
| | Designing the Project..... | 40 |
| | Conflict and Cooperation Among the Extension Agents..... | 42 |
| | Contractual Arrangements..... | 43 |
| | The Pepper Producers..... | 44 |
| | Problems with Change: Why do some farmers do better than others?..... | 48 |
| | Same Conditions, Different Results..... | 53 |
| | Conclusions..... | 55 |
| 5. | COMPARISON OF THE PERFORMANCE OF RICE AND CAYENNE PRODUCERS..... | 57 |
| | Levels and Stability of Incomes..... | 57 |
| | Size of farm and productivity: relative uses of labor and capital..... | 58 |
| | Developing Human Capital and Transferring Technology..... | 59 |
| | Technical and logistical support..... | 61 |

| | |
|--|----|
| The credit markets..... | 62 |
| Excess Income and the Possibilities for savings..... | 62 |
| Conclusions..... | 63 |
| 6. CONCLUSIONS AND POLICY RECOMMENDATIONS..... | 67 |
| REFERENCES..... | 75 |

List of Acronyms

| | |
|---------------|---|
| ACIAR | Asociación Costarricense de Interacción y Acción Regional Costa Rican Association of Regional Action and Interaction |
| CAC | Centros Agrícolas Cantonales Town Agricultural Centers |
| CNP | Consejo Nacional de Producción National Council of Production |
| IDA | Instituto de Desarrollo Agrario Agrarian Development Institute |
| MAG | Ministerio de Agricultura y Ganadería Ministry of Agriculture and Livestock |
| ODRES | Organización Para el Desarrollo Sostenible de la Región Chorotega Organization for the Sustainable Development of the Chorotega Region |
| PROPICA, S.A. | Compañía Agrícola Industrial, PROPICA S.A. Piper and Capsicums Processors of Central America, S.A. |

**SMALL FARMERS AND THE TRANSITION TO NON-
TRADITIONAL AGRICULTURE IN
GUANACASTE, COSTA RICA**

by

Carmen Álvarez Torres

Submitted to the Department of Urban Studies and Planning
in Partial Fulfillment of the Requirements for the
Degree of Master in City Planning

ABSTRACT

Many government officials and policy-makers in developing countries support the adoption of non-traditional export crops among peasant farmers as a way of promoting economic development in the rural sector and providing new production alternatives for the rural poor. Nonetheless, these policy initiatives many times fail because the small producers are not able to adapt to the new technologies, cannot access the production and marketing structures of many agro-export products, or lack the necessary initial conditions in terms of financial and capital investments to be able to penetrate these types of activities. This thesis studies what public sector officials in the rural sector institutions can do to facilitate the transition of small-farm producers from traditional to non-traditional agriculture. It focuses on a case study of a group of basic grains producers in the province of Guanacaste, Costa Rica, who started to plant cayenne pepper for the export sector, and on the innovative role of the public sector extension service agents in this locality.

The analysis of this case study derives important lessons for agricultural policy, and for the design and implementation of projects for the rural sector.

Thesis Supervisor: Alice Amsden
Title: Professor of Political Economy

Chapter 1

Introduction

A recurrent debate in much of the literature on rural development in developing countries is whether the promotion of agro-exports in the rural sector has positive or negative effects on the peasant farmers. The current literature offers contradictory views on this subject. On the one side, several studies in Latin American countries indicate that small farmers are traditionally excluded from the more lucrative crops because they lack the capital and financial requirements to be able to produce crops for the exports market (Carter and Mesbah 1993, Twomey and Helwege 1991, Stanley 1994). These studies show how, for example in Honduras (Stanley 1994), Guatemala, and Chile (Barham, Carter, and Mesbah, 1994), the modernization of agriculture led to the concentration of land tenure in the rural sector, to an increase in rural unemployment due to a more intensive use of agricultural machinery, and to a worsening of the inequality of income, asset distribution, and absolute poverty among the rural population. In contrast, other studies indicate that the adoption of new technologies can result in a decline in rural poverty (Gotsch 1972, Hazell and Ramasamy 1991), that the modernization of agriculture may lead to improvements in income distribution (Timmer 1991), that it can accelerate the process of industrialization of the rural sector through the development of agroindustrial activities, and that it may generate employment in both agricultural and non-agricultural activities (Mynt 1979, Hazell and Röell 1983, Ranis and Stewart 1987).

Even when there is much debate about agricultural transformation and non-traditional products (NTPs), most of the literature focuses on whether the farmers' economic conditions

improve as a result of engaging in these activities. But what are other possible benefits and disadvantages associated with the production of traditional crops and with non-traditional agriculture? Why do some farmers adapt to the new technologies better than others? What types of policy measures facilitate and/or hinder this change process? This thesis will help to answer these questions by focusing on the lessons provided by a project that promotes the adoption of a non-traditional export crop by small farmers in the province of Guanacaste, Costa Rica.

Costa Rica was the first Latin American country to embrace substantive policies encouraging non-traditional exports. These policies, which originated in the mid 1950's in response to the inability of the traditional export commodities (coffee and bananas) to promote sufficient development of the region's economy (Brockett, 1997), included subsidized credit policies for agro-exports, fiscal incentives, and public investments in infrastructure developments that favored the export sector. From 1984-1989, non-traditional agro-exports grew by 348%, and the participation of this sector in the country's total exports increased from 12% in 1984 to 48% in 1993 (Carter, Barham, and Mesbah 1994).

Many development economists and policy makers in Costa Rica consider that providing government support for the transition from traditional crops to non-traditional exports is a policy measure that will have positive effects in increasing the incomes and living standards of small producers in the countryside, and for the development of the agricultural sector as a whole. These analysts and government officials share the view that agro-exports tend to promote economic development more than traditional agriculture. Some of the arguments that support

these assumptions are that through the change to non-traditional agriculture farmers will acquire specific skills and knowledge for producing specialized goods therefore increasing their human capital resource and enabling regionalization of crops, will develop a more entrepreneurial mentality to farming that will permit them to assess the costs and returns of a product in a more accurate way, and will receive transfer of technology from the large and medium farmers through the adoption of new seeds, inputs, and farming practices.

Small farmers in other regions of the country have engaged in the production of agro-exports with different levels of success. But the agricultural sector of my region of study, Guanacaste, the second poorest province in Costa Rica, has traditionally remained in a backward situation relative to the more dynamic and modern agricultural growth of the Central Valley region, where small farmers started successfully producing coffee in the late nineteenth century. Guanacaste, with pronounced climatic changes between the dry and rainy season, and prone to droughts and seasonal floods, is characterized by pronounced socio-economic inequalities among the rural population. A sizable part of the farmland in the province is dedicated to large rice haciendas and cattle-holdings. Small-farm developments, traditionally oriented towards subsistence agriculture and the production of basic foodgrains, are characterized by a very low productivity. As most small-farm agriculture is done without irrigation, the highly variable levels of rainfall in the region account for highly unstable production yields among the small farmers.

Trying to change Guanacaste's backward conditions in the agricultural sector, the central government has recently focused strong policy efforts towards supporting NTP initiatives

among small farmers in the region. The principal agents for the implementation of the national policies towards the agricultural sector, and of the design and development of projects for the promotion of NTPs, are the regional offices of the Ministry of Agriculture and Livestock (MAG). These regional offices are the agricultural extension service providers for the rural sector. Under the new national ordinances of promotion of NTPs and agricultural diversification, MAG officials are looking to find projects that help to develop a modern, more managerial and entrepreneurial approach to farming and agriculture. Policy makers argue that the strong human capital resource component that the Costa Rican economy has acquired through the central government's public massive investments in sectors such as infrastructure, education, and health, will help to foster the development of high levels of specialized skills among farmers. The argument is that an educated population, with infrastructure developments, is more capable of absorbing and adapting the new technology (Myint 1979).

In this paper, I will study how the public rural sector institutions, particularly these regional offices of the MAG, establish a project to bring the production of NTPs to the small traditional farmers in the region. The project consists of a contractual arrangement between an agro-industrial company, Compañía Agrícola Industrial PROPICA S.A., and small farmers in the region for the production of cayenne chili pepper. PROPICA S.A., a medium-sized, privately owned company, is a processor and exporter of capsicums¹, -in the forms of pepper mash, and white and black pepper- mainly for the US market. Pepper mash is an intermediate agro-industrial product which is used in the preparation of hot sauces and similar food products.

¹Capsicums is the name of the family of pepper plants. There are five types of capsicums produced for commercial purposes. They are: c. annum, c. frutencens, c. chinense, c. bacata, and c. pubescens. Capsicums annums are

The four actors involved in the project are: a) the MAG extension agents and administrators, b) the company, PROPICA S.A., c) the producers, and d) the NGOs that provide the credit to the farmers. Under the terms of the project every participant has clearly defined roles. The MAG has an administrative role, as well as the role of providing technical assistance and serving as a mediator between the farmers and the company. The Company has to: a) provide a technological package for the production of the crop, b) provide the seeds, c) buy all the production from the farmers at a fixed price in US dollars, and d) provide technical assistance to the producers. The producers sign a contract in which they agree to follow the indications of the technological package, abide by international regulations in fertilizer use and farming practices, and to sell all the production to PROPICA. The NGOs, two of them, provide the credit for the project. These functions will be analyzed in detail in Chapter 4. This case is interesting to study for several reasons.

First, it is the first time that small farmers in Guanacaste receive exposure to the production process, farming methods, and marketing arrangements of NTPs. This fact provides an interesting setting to analyze the farmers' reaction to the new technologies, and the problems that they encounter in the change process. Elaborate.

Secondly, the role of the MAG as extension service provider is interesting in this case because the extension agents manifested a strong personal commitment to the success of the projects, even when the institutional system of public service delivery is characterized by the absence of rewarding and sanctioning mechanisms. Cases such as this one, when the public

the most produced for commercial purposes. They include the cayenne, the jalapeño, the panama, and the tabasco varieties.

rather than the private sector engages in innovative behavior have been largely ignored in the literature on induced innovation (Ruttan and Hayami 1990). In the absence of personal economic gains to innovation, the drive towards technological inducement may be motivated by a drive for professional achievement and social recognition (Lipsky 1980, Niskanen 1968). This is particularly important, in conditions of poverty and alienation, when the options that peasant farmers have for self-induced innovation and access to modern technology are very limited. In this sense, the response of research scientists and administrators to new technological developments represents a critical link in the process of modernization of agriculture. For the case of Guanacaste, I found that the drive of the extension agents was partly fueled by their confident belief in the income generating capacities of the NTPs. This confidence corresponds with the national policy drive towards the promotion of NTPs. Most government officials, extension agents, and academics agree that NTPs are the answer to small farmer development in the Costa Rican rural sector.

Thirdly, the case is helpful to analyze how the public sector can serve as a link between the agro-industrial sector and the small farmers for the purpose of transferring technology. With the objective of facilitating the transfer of technology to small farmers, the MAG officials look to develop projects in conjunction with agro-industrial companies. Their reasons for these modes of action are that the private enterprises have the experience, the technology and the knowledge of the markets, which are necessary to find and target commercially feasible crop alternatives for the small farmers in the region.

To determine the real benefits and disadvantages associated with the production of traditional crops and with non-traditional agriculture, and to analyze the process of change from one farming alternative to the other, I will compare two sets of farmers engaged in these two types of activities. Traditional agriculture in Guanacaste refers essentially to rice, corn, beans, and livestock production. Of these activities, most small farmers only produce rice and corn for commercial purposes². My study will focus on the production of rice, as for most of the farmers in my sample rice is their main commercial crop³. I will compare the traditional and the non-traditional farmers⁴ on the basis of the following criteria:

1) Levels and stability of incomes- I will determine the income generating possibilities of both production activities, and test whether there are possible gains to farmers in terms of the stability of their yearly incomes from the different crops. This is important because the climatic conditions of the region of study, Guanacaste, render a concentration of most agricultural activities in the rainy season, and high levels of unemployment during the summer. In this sense, analyzing the possible tradeoffs between the levels and the stability of small farmers' incomes is a relevant consideration in calculating the farmer's benefits from these activities.

2) Size of farm requirements and the labor to capital ratio- I will test how the size of the farm, the minimum size required to achieve efficiency in productivity for the different crops, and the relative use of labor to capital in the production process, influences the benefits small farmers receive from the production of basic grains and the production of cayenne pepper. This

²Most small farmers in this region plant beans only for family consumption, and livestock holdings are in the hands of the large landowners.

³Nonetheless, most of the farmers plant a mixture of crops that include both, crops planted for commercial and for consumption purposes.

criteria is relevant because it has important implications over the small farmers access to agro-export crops structures and the appropriateness of the technology to the local conditions.

3) Quality and productivity of the labor force, transfer of technology, and the development of human capital- I will compare the levels of specialized knowledge and skills that the farmers require for both activities, the levels of technology that they employ, and the transfers of these two factors from the private sector to the producers. This criteria is central to the discussion on whether NTPs promote the development of human capital through a change in the culture of production, with the idea that farmers should be able to develop a more entrepreneurial mentality to farming. The maturation of an ability to assess costs and benefits to a product when they are presented with different production alternatives is of particular relevance. This is important because changing the culture of production from “slash and burn” to a more attention intensive mentality is one important concern of the extension agents in promoting NTPs.

4) Technical and logistical support- I will assess what types of support and production incentives the farmers receive from institutions in the rural areas, including both the public and private sectors. These supports include extension services, technical assistance, capacitation of the farmers, and the provision of different services, such as in-farm distribution of inputs and the provision of transportation services for the products from the farms to their final destination. This criteria is important because it has significant effects on the producers’ decisions on what to plant, particularly for the cases of those producers who live in very remote localities.

⁴ I will use the term “traditional farmer” to refer to the producers who plant rice, corn, and/or beans as their main crops, and the term “non-traditional farmer” to refer to the cayenne pepper producers.

5) Availability and conditions of credit options- I will test if the availability of financial credit and the conditions in which small producers can access this credit are different from one crop option to the other, and how this fact affects the decisions farmers make, their allocation of resources, and their use of inputs. This criteria is important because credit policies are one of the most determinant factors in the producers decision on what economic activities to pursue.

6) Excess income and the possibilities for savings- I will compare the opportunities for savings that these different activities present to the producers, as well as the differences in their attitudes towards saving and re-investing cash excesses. This criteria is relevant to the study because it helps to determine which productive options present more opportunities for up-scaling to a higher socio-economic level, and also it serves to study cultural changes in the mentalities of the traditional and the non-traditional farmers in relation to their attitudes towards saving.

Research Methodology

This thesis is based on field research in the province of Guanacaste, Costa Rica, carried out in the months of July, August, and December, 1996, and January, 1997. During that period, I conducted approximately 78 interviews. I interviewed 61 farmers - 34 farmers who produced cayenne pepper and 27 farmers who produced basic grains-; 9 extension agents and regional administrators in the *cantones* where the farmers were located - Liberia, Bagaces, La Cruz, Santa Cruz, and Carrillo-; the managers of the two NGOs that provided the funding for the project; the manager of the company PROPICA, S.A.; the administration of the rice hacienda and mill El

Pelón de la Bajura; engineers of the same mill; and several local leaders involved in farmers' associations.

I compared small farmers producing rice, with small farmers producing cayenne pepper. To compare these two sets of farmers, I matched the farmers who produced cayenne pepper on a one to one basis with the farmers who produce basic grains and who had similar characteristics in terms of socio-economic status, ownership and/or access to land, farm infrastructure, and geographic locality. I gathered this data through interviews to the cayenne farmers, whom in most cases suggested a basic grain producer whom they considered to be in a similar social and economic condition. When this was not possible (in some locations there were no basic grain producers), I made the match with a grain producer from another location following the same criteria.

I studied rice as the traditional activity because of the traditional agricultural activities in Guanacaste, which are rice, corn, and livestock, rice is the one that most small farmers produce for commercial purposes. It has a long history in the region, and farmers have many years of experience with the crop.

I chose cayenne pepper as the non-traditional export crop because, of the projects currently implemented in the region, the cayenne pepper crop is the most tailored for the characteristics of small farmers, in terms of its relative use of labor to capital, land requirements, credit provisions, and initial capital investments.

This study is organized in six parts. In this first chapter, I summarize the purpose and the organization of the study and state the problem, research questions and methodology. In the

second chapter, I present a brief overview of the agrarian structure in Guanacaste, the role of the MAG in the rural sector, and how the national macro-economic policies towards agriculture have affected the production of basic grains in the region. In the third chapter, I study the crop options, marketing outlets, and contractual arrangements of the farmers producing traditional crops. I focus on the production structure of these farmers to determine whether a move to non-traditional agriculture would mean an improvement to their present situation. In the fourth chapter, I explain the origin and design of the cayenne pepper project, the universe of the farmers, the role of the private and public sector, and the factors that influence the success and failure of farmers within NTP projects. In the fifth chapter, I compare the traditional and the non-traditional farmers on the basis of the stated criteria, and I present the problems to change and to the adoption of new technologies that arose in the transition process. In the last chapter, I present the conclusions of the study and the policy recommendations.

Chapter 2

The State Models for Rural Development and the Agrarian Structure in Guanacaste

In this chapter, I describe the agricultural sector in Guanacaste, and the policies that the State has enacted to incentive and disincentive different types of crops through the years. I also describe the institutional framework of the State's policy interventions, in particular the extension services of the Ministry of Agriculture and Livestock and the way in which they relate to the productive activities of the small farmers in the region.

The agricultural sector has historically been the most important component of the Costa Rican economic development. The national economy is still highly dependent on traditional export crops. Coffee and bananas together represent 47% of the value added of the agricultural sector, and 68% of the total of agricultural exports. Nonetheless, due to the nature of the foreign markets for these traditional crops, the growth projections for these products are limited.

The agricultural sector is the most dynamic activity of the national economy. It generates 70% of the foreign currency, represented 61% of all exports between 1988 and 1994, and contributed 19% of the GDP between 1987 and 1993. In addition, agriculture employs a large percentage of the working sector. In 1995, it employed 22% of the economically active population (Encuesta de Hogares de Julio 1995, Dirección General de Estadística y Censos: San José, Costa Rica, 1995).

During the last two decades, the Costa Rican government policies towards the agricultural sector have focused on the promotion of non-traditional crops for the international markets. These types of export crops often require strong capital investments. But at the same

time, they come embedded in advanced technological packages, thus fostering a transfer of technology to the agricultural sector, and, more importantly, they have clearly defined marketing schemes. Examples of these crops are flowers, ornamental plants, macadamia nuts, and citrus, among others.

The Agrarian Structure in Guanacaste

Guanacaste, a province located in the NW coast of Costa Rica, bordering with Nicaragua on the North and the Pacific Ocean in the West, has historically been excluded from these new types of agricultural developments. This region, which in pre-Columbian times was the southernmost extreme of the area under the influence of the mesoamerican culture, was governed during most of the colonial period as a separate entity from Costa Rica. The colonial authorities governed it as an independent Party more associated with Nicaragua, a country from which the Guanacastecan culture takes most of its characteristics. The Guanacastecans -most of them descendants of the Chorotega Indians, African slaves, and to a lesser extent, Europeans- are very aware of the differences between them and the “white” coffee growers from the Central Valley.

The Chorotega Region has an area of 900,000 Ha., of which 600.000 Ha. are in agricultural production and 300.000 Ha. are used for livestock (Departamento de Suelos y Evaluación de Tierras del MAG, 1995). The most important activities are cattlestock and rice - often carried out jointly in large haciendas that sometimes date back to colonial times. The ideological concept of a rural democracy built over the basis of small coffee producers, with which the State has constructed national identity in Costa Rica, is totally alien to Guanacaste. With 247.523 (1995) people in a region of 11.736 Km², 34% lies under the poverty line

(Encuesta de Hogares de Julio 1995, Dirección General de Estadística y Censos: San José, Costa Rica, 1995).

The major traditional crops in the region are beans, corn, and rice. The farming systems and production technologies range from traditional technology and abundant use of manual labor among the small farmers, to highly mechanized large farms, particularly for rice production for the urban market.

The situation of small farmers in this province has been particularly harsh. One of the main problems for agriculture in Guanacaste are its intensely pronounced dry and rainy seasons: the dry (summer) season, from December to April, and the rainy (winter) season, from May to November. In the summer, water is a very scarce and expensive resource. Most small farmers lack irrigation systems, and some do not have access to a water source. Thus, most of their agricultural activities take place in the rainy season. A good rice, beans, or corn harvest requires an annual precipitation of at least 1.500 to 2.000mm, well distributed throughout the rainy season (Edelman, 1988). But in Guanacaste, there is always a very high annual and monthly variability in rainfall. The Guanacaste producers are familiar with droughts, floods, and the loss of their crops. It is not unusual to harvest amounts too small to support the family consumption or to provide seeds for the next production cycle.

The production of basic grains in the region is characterized by a low-risk, low-investment type of technology that yields little excess for commercialization. Because of the unpredictability of the yields, the farmers have to strike a precarious balance as part of their economic decision to ensure the family's minimum security. They have to decide whether to

cultivate the land with their own resources or to incur in costly expenses that, even when they could result in increased productivity, the profitability of the investment will still depend on how the rains come. Most farmers prefer to substitute investments in costly inputs for labor, which is their abundant resource.

Public Sector Institutions and Agricultural Development

The central government has channeled its intervention in agriculture through the establishment of an institutional framework of organizations that deal with the different problems of the rural sector. The most important of these are: the Instituto de Desarrollo Agrario (IDA), the Consejo Nacional de Producción (CNP), and the Ministerio de Agricultura y Ganadería (MAG).

IDA is the entity in charge of the distribution and titling of lands subject to land reform. Since 1963 it buys farms from private owners and distributes parcels among peasant pressure groups. The parcels are grouped in peasant settlements of about 30 to 40 families. The CNP was established in 1948 with the purpose of stabilizing prices and guaranteeing basic grains self-sufficiency in the country. From 1948 to the 1994, it was also the market for the production of rice, corn, beans, and sorghum, crops for which it established fixed floor prices. The MAG's functions were in agricultural research, technological transfers, and extension services provision.

The central government regionalized these institutions in 1979. These agencies form the institutional framework through which the government applies its policies towards agriculture. In particular, the MAG's role as extension service provider is crucial to the activities of the small farmers throughout the different regions of the country. It is partly from the MAG agents that

small producers receive technological transfers, marketing orientation, and access to credit sources.

These policies of providing floor prices, targeting subsidized credits for the rural poor, offering extension services, and redistributing lands, favored the activities of small grain producers in Costa Rica. But within the context of structural adjustment in the 1980's, the agricultural development model in Costa Rica took a new turn towards the disincentive of the production of basic grains among small producers and the support of non-traditional agriculture. Under the stated national policy objectives of reducing the government's levels of tariff protection, promoting efficiency and productivity among the private sector, and modernizing and reducing the size of the State, institutions such as the MAG, the IDA, and the CNP have undergone serious budgetary restrictions. The emphasis of the international financial organisms in efficiency, promotion of exports and comparative advantages, when translated to national agrarian policies, resulted in discouraging the credit and pricing policies that previously benefited the production of basic grains.

The new policies presented a serious political problem for the central government. In the past, the traditionally benevolent behavior of the Costa Rican government, expressed through the development of a modest agrarian reform, extensive programs of subsidized credits channeled through the nationalized banking system, technical assistance from the MAG and other state institutions, and low-cost inputs and floor prices subsidized by the Consejo Nacional de Producción (CNP), helped to maintain a security net for the Costa Rican agrarian sector. These measures are part of the reasons that explain why Costa Rica experienced social and political

tranquillity in the rural sector in the past decades, while the other countries in Central America - particularly El Salvador, Nicaragua, and Guatemala- lived through decades of violence and repression in the countryside⁵.

To deal with the discontent that the new policies produced among the rural population, the central government, through the regionalized IDA, CNP, and MAG offices, started to promote the development of non-traditional agricultural products. These local authorities, particularly the MAG administrators and extension agents, have taken a strong stand in the promotion of NTP projects among small farmers. The encouragement of these new types of projects marks a difference in the MAG's traditional role in the region of Guanacaste. In the past, this role was geared towards a general support of all agricultural activities, which in this region were principally basic grains. At present, the MAG's functions focus on finding unexplored markets and non-traditional crop options in which small farmers are able to compete commercially.

The MAG Extension Agents and the New Type of Projects

The MAG regional offices administer the provision of extension services in every cantón in the rural sector. Usually one agronomical engineer -the agent-, and two or three *técnicos*, plus the administrative personnel, make up the office. Another organization, the Centros Agrícolas Cantonales (CAC), is the meeting place for agents, farmers (small, medium, and large), and community leaders to discuss their concerns, plan joint actions, and promote popular participation in the development of new projects. Some CACs also give out small loans to

⁵Costa Rica developed over its history a strong rural middle class which, together with the relative absence of a neofeudal class of elite landowners supported by coercive labor systems, allowed to develop a vibrant political

farmers. In practice, the MAG and CAC usually work together, often sharing the same office space. But their level of integration and joint participation in different projects varies by cantón. In any case, the MAG agents generally have the lead in project development.

Extension agents in Guanacaste do not always agree on a number of things. The system is very personalistic and there are many opportunities for conflicts. These will be explored with more detail in Chapter 4. But one subject on which all extension agents agree is on the necessity of small farmers to turn away from the production of basic grains as an economic activity. The agents are convinced that the production of basic grains should be in the hands of the medium and large producers, who can do it more efficiently because they have the irrigated lands, the capital investments, the financial resources, and the higher levels of technology. Small farmers, on the other hand, need to turn to crops that are more adequate to their limited conditions of lack of irrigation, reduced capital resources, and the need of a dependable harvest that permits them to meet their minimum subsistence requirements.

With these objectives in mind, the MAG agents seek for new types of projects that include in their design the following characteristics: the products must have secure and guaranteed markets, the projects must include a credit source from a financial institution, the production technologies will be based on a “proven” technological package⁶, generally provided by the product buyers, and the target of the projects must be small and medium farmers, as opposed to the large producers. In short, the projects constitute all-encompassing packages that

democracy after WWII. Consequently, Costa Rican development policy has been implemented with a more explicit welfare component in a less stratified society than those of neighboring countries (Brockett, p. 18).
“These “proven” technologies are farming practices (seed, inputs, machinery, etc.) that agricultural producers have been employing elsewhere with successful outcomes. The buyers of the products, which in most cases are agro-industrial companies, usually provide the technological package.

include in their design all the factors relating to the production of the crop: the technological inputs that the farmers will use, stable marketing arrangements, credit provisions, capacitation of the producers, technical assistance, extension services, and transportation considerations. Also, when the markets are agro-industrial companies, the contractual arrangements between the producers and the buyers must be clearly defined in legally binding contracts.

A longer-term goal with the new type projects is that, through the production of non-traditional crops, farmers will develop a more entrepreneurial approach to farming and agriculture, and that they will consider their units of production not as farms but as small enterprises. Moreover, the agents also have the expectations that the projects will foster the development of farmer's specialization in high skill crops, and the transfer of technology between the agro-industrial sector and the small farmers. This developments will lead to an increase in the human capital resource of the region.

This chapter explained how the central government intervened in the agricultural sector to promote the different models of national economic development, from the emphasis on basic grains self-sufficiency of the 1950's to the 1970's, to the promotion of non-traditional crops of the 1980's and 1990's. It showed how small farm developments in Guanacaste, traditionally oriented towards subsistence agriculture and the production of rice, corn, and beans, now face unfavorable conditions for the production of these traditional crops. These conditions include: the disappearance of State markets and fixed floor prices for these products, the absence of credits from the private and public banks, and a reluctant attitude from the MAG agents to provide extension services for these traditional crops. This attitude of the agents responds to

their conviction that the production of basic grains is not a viable economic activity for the small farmers in the region. The agents, on the other hand, promote a new type of projects for the development of NTPs, which focus on the existence of markets, the search for credit options, the transfer of technology, and the links to the agro-industrial sector.

In the next chapter, I analyze the production structures, marketing outlets, and socio-economic conditions of a sample of farmers who produce traditional crops, namely rice, corn, and beans, in Guanacaste. I will study the present financial, productive, and socio-economic circumstances of the small basic grains producers in the province, in order to determine whether a move to non-traditional agriculture would mean an improvement to their present situation.

Chapter 3

Traditional Agriculture and Small Rice Farmers

In this chapter I will analyze the crop options, marketing outlets, and contractual arrangements of a sample of 25 farmers that produce basic grains, namely rice, corn, and beans, as their main agricultural activity in the province of Guanacaste. The purpose of this chapter is to present the economic and productive setting of traditional agriculture in Guanacaste, and analyze the social and economic conditions of the small farmers who develop these types of activities. This will permit me to compare the traditional farmers with the cayenne farmers, in order to analyze the agricultural change process from traditional to non-traditional crop alternatives, and to determine if this change is a favorable development for the small farmers in the region.

The basic grains in the Costa Rican diet are rice, corn, and beans. Households that farm for subsistence are particularly dependent on rice and corn, which are the main sources of protein for the lowest income groups. The production methods for these grains are divided between the larger grains, rice and sorghum, and the smaller grains, beans and corn. Most of the rice production for the urban market is in the hands of medium and large farmers. Rice is also an important economic activity for small farmers in the region of Guanacaste, but as we will see, their farming methods yield low and highly variable output levels. I interviewed a sample of 25 farmers. Most of them (17) plant rice as their main commercial crop.

Tenure Patterns and Uses of Land

All the farmers that plant rice for commercial purposes are land owners. Their farm sizes range from 7 to 30 hectares, with an average farm size of 11.5 hectares. Most of them (20) received their lands from the IDA, as part of the process of agrarian reform, and reside in agrarian reform settlements. This is an important characteristic of the agrarian structure in Guanacaste, and in Costa Rica as a whole. A modest process of agrarian reform has redistributed lands to a significant number of farmers. Even when in Guanacaste the sizes of large and small farms differ greatly, the fact that small farmers can have access to at least a small area of land has helped to ameliorate the inequalities in the rural sector. Most agrarian reform parcels are close to 10 Ha. in size (Table 1).

Table 1
Sample Size of Parcels Among the Small Rice Farmers, Guanacaste, 1997

| Size of Parcel | No. of Farmers |
|-------------------------|----------------|
| Landless Farmers | 0 |
| 5-7 Ha. | 3 |
| 9-11 Ha. | 13 |
| 12-14 Ha. | 4 |
| 30-50 Ha. | 3 |

The farmers in my sample plant an area that ranges from 3 to 12 hectares, for an average land farmed of 6.7 hectares. Three farmers plant with irrigation, and produce two harvests each year. The rest plant only during the rainy season⁷.

Farming activities among traditional farmers in Guanacaste are primarily in three land uses: basic foodgrains (rice, corn, and beans), root crops (yuca, ñampí, tiquisque, and others),

⁷I decided to leave these three farmers who plant with irrigation in the sample because they were an adequate match in terms of social and economic initial conditions for three better off farmers in the cayenne pepper sample.

and vegetables (tomatoes, cucumbers, onions, etc.). Most households plant more than one crop to cover their consumption necessities and to increase their possibilities of having crops for sale at the end of the harvest.

Table 2
Diversification of Crops among Traditional Farmers, Guanacaste, 1997

| No. of commercial crops | No. of Farmers |
|-------------------------|----------------|
| 1 crop (rice) | 7 |
| 2 crops | 10 |
| 3 crops | 4 |
| 4 or more crops | 3 |

Only 7 households plant only one crop for commercial purposes. For all of these, that crop is rice. The beans and corn harvests are seldom productive enough to provide excesses for commercialization. The producers invest most of their resources -labor and inputs- in the rice harvest in order to maximize their returns to capital. In Table 3, we see that most farmers plant a combination of rice, beans, and corn. These mix of crops is both for commercial and for consumption purposes. The rice-corn-beans combination is mainly to satisfy their domestic consumption needs, but for most rice is the main commercial crop. Rice is a better production alternative than beans and corn because the climatic and topographical conditions of this region are better suited for the commercial production of rice than for beans or corn.⁸

⁸Farmers in other regions of the country can produce corn and beans at lower costs and higher levels of productivity. This is particularly true for beans. For corn, most of the product is produced closer to where the large corn processing companies are located. These companies are the main markets for the national corn production. They use corn to produce basic consumption goods such as tortillas, corn flour, and many other corn-based products, mainly for the urban market.

Table 3
Popular Activities among Traditional Farmers,
Guanacaste, 1997

| Activity | No. Farmers | Non-Consumption Purposes ⁹ |
|----------|-------------|---------------------------------------|
| rice | 17 | 17 |
| corn* | 16 | 9 |
| beans* | 12 | 5 |

Farming Methods Among Small Farmers

Rice production in Guanacaste has been very dynamic for the medium and large farmers. Partly as a result of the Green Revolution and the introduction of high yielding varieties and new technologies, as well as government support for production in the form of subsidized credit, floor prices and crop insurance, the total land in production of rice duplicated from 1968 to 1988, while the productivity triplicated (Guzmán and Naranjo 1988). Nonetheless, this was only true for the large rice haciendas that produce the consumption for the urban population, but among small farmers there still prevails the use of low levels of inputs and extensive labor¹⁰.

In the production of basic grains among small farmers prevails a low risk-low investment type of technology that yields little excess for commercialization. This is true for rice, corn and beans production, with the difference that, while the large rice haciendas produce most of the rice for the urban sector, most corn and beans production is essentially in the hands of small farmers. For these basic grains farmers employ traditional technology, agro-chemicals and a substantial amount of manual labor. Farmers make the decision on whether to add fertilizer based on their

⁹For non-consumption purposes means here that the farmers main intention in planting these crops is for commerce, as opposed to for family consumption and then selling the surplus.

¹⁰The small farmers did not benefit as much from these reforms because they could not access the large sum credits, and they lacked irrigation, and therefore they were not able to access the new technology.

current availability of resources. They usually do not add fertilizer for crops that are for family consumption.

For corn, there is usually some level of mechanization of tasks in the form of a grain mesher assembled to a tractor. The introduction of higher yielding seeds has not diffused significantly among the small farmers. In 1993, only 24% of the land planted with corn and 15% of the land planted with beans were HYV, and the use of credit for these two activities was only 14% of the total credit used for basic grains(10% for corn and 4% for beans, compared to 67% for rice and 14% for sorghum) (Guzmán 1993).

The Commercialization of Basic Grains

The commercialization of the grains is not the main problem for small farmers. Most farmers singled out the stability and security of the foodgrains market as one of the main advantages of planting traditional crops. The rice production always has buyers, which are usually the private rice mills in the zone. Moreover, rice still has floor prices fixed by the Oficina del Arroz (The Office of Rice).

In the case of corn, most farmers sell the grain to agro-industrial processors who use it for the confection of tortillas and other foodproducts. The beans and the other fruits and vegetables, they sell either to neighboring commerces or to middlemen who come to the farms in the harvest time. If the farmers consider the prices that these marketing outlets offer too low, they can always sell to SENADA, a State market that buys fruits and vegetables.

Problems with Traditional Agriculture

The main problem with the production of basic grains is the unpredictability of the climatic conditions, particularly, the levels of rainfall. A good rice, beans, or corn harvest requires an annual precipitation of at least 1.500 to 2.000mm, well distributed throughout the rainy season. Farmers without irrigation depend on how the winter comes for the yields of their harvest. In Guanacaste, there is always a very high annual and monthly variability (Edelman 1988). Thus, the Guanacaste producers are familiar with droughts, floods, and the loss of their crops. It is not unusual to harvest only a small amount not even enough for family consumption or for seed for the next cycle. But there is always the expectation of making at least enough to cover the family's consumption.

To achieve this minimum security, the farmers have to make a decision on whether to cultivate the lands with their own resources or incur in costly expenses. Due to the unpredictability of yields, some farmers prefer to invest great amounts of family labor and restrain from inputs they would have to purchase such as fertilizers, and hiring mechanized labors. But others also incur in significant cash expenses such as renting the land, getting bank loans, hiring labor, and purchasing costly inputs.

Table 4
Sample Production Costs and Production Yields per Ha. for
Small Farmers, 1996-1997

| | Costs/Ha. | Sacks*/Ha. |
|----------------------|------------------|-------------------|
| Irrigated | \$590-\$890 | 60-80 |
| Non-irrigated | \$490-\$540 | 15-45 |

*One sack=73.6Kg.

The productivity of some of the rice farmers is strikingly low. One of them reported that in thirteen years of planting rice, only once she made a profit. In the last harvest, the rains flooded most of the parcels in the community where she lives. As a result, the demand for tractors increased more than usual, and only the farmers who could pay more for the mechanized labors could harvest in time. She had to wait more than a month until she could harvest her rice. But this was not an unusual occurrence. During the past three years, the yields of her farm have been on average 16 sacks/Ha., less than one-fourth of the average harvest yields for medium and large producers.

Technical Assistance and the Transfer of Technology

Rice farming is an old and established activity in Guanacaste. All the farmers in this study have planted rice for at least ten years. They are very familiar with the farming system and with the problems of plagues, pests, and the like. Furthermore, they benefit from a supporting community around them with the same type of skills and knowledge that they have, including neighbors, private haciendas, and the engineers in the MAG regional offices.

Most rice farmers have the opinion that they do not need extensive assistance from the MAG because they already know the crop. But the extension agents themselves prefer not to work with the small rice farmers either. As explained in Chapter II, most extension agents strongly feel that traditional agriculture is not a favorable economic option for the small farmers. They express repeatedly that subsistence farmers need to rise to the level of small entrepreneurs, who make their decisions on the basis of the returns that they can obtain from their unit of production. Because they feel that what small farmers can obtain from rice does not amounts to

much, the greater part of their efforts are oriented to the development of non-traditional products in the region.

Cooperation Between Large Rice Haciendas and Small Farmers: The Case of El Pelón and Two Agrarian Reform Settlements

I will study in this section an interesting case of cooperation between a large rice farm and the farmers from two neighboring agrarian reform settlements. The hacienda El Pelón de la Bajura is one of the biggest single suppliers of rice for the domestic market. It mills and markets 520,000 sacks of rice a year, 12% of the Costa Rican domestic market. Located in an expanse of 3,760km², the hacienda looks more like a town of its own. They have their own schools, parks, and food-markets, and also they produce part of the consumption goods for the diets of the workers and their families (milk, meat, and eggs). At the sides, El Pelón is surrounded by four settlements of small farmers: Playitas, San Ramón, La Falconiana, and Llanos del Cortés. These settlements are a result of agrarian reform and of the land redistribution process enacted by IDA. It is interesting to study these settlements because the farmers in two of them, La Falconiana and Llanos del Cortés decided to plant cayenne pepper, while those in the other two, Playitas and San Ramón, are rice farmers and express a strong support for rice production over non-traditional crops.

Most of the small producers in Playitas and San Ramón were formerly landless farmers and/or workers in the nearby town of Liberia, capital of the province of Guanacaste. They established themselves in the settlements ten to thirteen years ago, when they received the lands from the IDA. As the other two settlements, they are located close to one of the limits of the hacienda El Pelón. But there is one central difference between them; for Playitas and San

Ramón, the state of the roads to reach the highway are in severe conditions. Getting out to the highway in a motor vehicle takes about one hour for a distance of less than 12Km, and in the winter, the roads are generally untransitable by cars or trucks.

Pelón allows the producers to use some of the services in the hacienda. They can shop at the market and can ride in the company bus to get out to the road and to Liberia. But although through Pelón's paved roads the producers could be in the highway in 15 minutes, the hacienda does not give them the right of way. They allege that it was very costly for them to built these private roads, and the government should be the one to provide the producers with adequate communication ways. Thus, transportation is the biggest problem for agriculture in these settlements.

These circumstances of absence of adequate roads, the settlers proximity to El Pelón, and the fact that the lands in the settlements are suitable for rice production, influenced the farmers in their decision to plant rice and sell it to Pelón, and in the development of certain relations of dependence of the small farmers relative to the hacienda.

First, El Pelón partly filled the credit gap that the nationalized banking system left when it retreated from giving out loans to small farmers for the production of basic grains. In the settlements, most producers receive production credits from El Pelón. State banks provided in the past targeted subsidized credits for small farmers, but with the new structural adjustment measures these policies were eliminated. In 1987, when it was becoming more difficult for the farmers to access bank credits, Pelón started to finance their rice production. Pelón finances three hectares, providing about US\$400 per hectare, at the commercial interest rate (25%

annual). The amount of the loan is equivalent to the production costs for one hectare.

Nonetheless, most farmers plant 7 to 10 hectares, and thus they are about US\$3,000 short of their total production costs.

The small farmers without irrigation do not have access to the commercial banking system, because these institutions do not finance non-irrigated agriculture. Other sources of credit that the farmers can access to fill this gap are savings and credit cooperatives, NGOs, and public sector related institutions such as the Caja Agraria of the IDA, and the Centros Agrícolas Cantonales (CACs). The CACs are composed of the extension agents, the farmers and community leaders. Sometimes the better off farmers have higher power quotas in this organization, but generally the social structure of the community is pretty fluid and there are no glaring distinctions between the higher and the lower income farmers. The CAC financing for rice is in the order of US\$175/Ha., much lower than the US\$439/Ha. that farmers need. As these sources of credits are scarce, the farmers usually have to resort to employing lower levels of inputs in the production process.

In any case, Playitas and San Ramón farmers prefer to receive financing from El Pelón because the transaction costs are lower (they do not have to go to the city, fill out paperwork, get guarantors, etc.), and the amounts of the loans are deducted directly when the farmers deliver their production, making it simpler for them to pay back the loans. Under the contractual arrangements they are not under the obligation to sell the production to Pelón, but all of them do. This is natural because rice prices are fixed by law, and Pelón is the closest market.

Another relation of dependence of the farmers with El Pelón is for technical assistance and extension services. The technological levels among the small rice farmers are similar, abundant use of labor and some level of mechanization depending on their financial resources. The primary difference between the farming system that Pelón employs and that of the producers is the irrigation. Naturally, the Pelón production is more capital intensive and they use a higher level of inputs. But the lack of irrigation is what makes most of the difference in yields. The transfer of technology from Pelón to the Playitas and San Ramón farmers develops in an informal way, through the assistance of Pelón engineers and staff to the problems that the producers encounter. In my visits to El Pelón, it was fairly common to see producers in the Pelón offices looking for a particular agronomist or asking questions to the technicians. Although there has not been a formal intention of transferring technology to the producers, the settlers proximity to this highly productive farm provides them with informal opportunities to absorb improvements, for example in the way of new seeds, fertilizers, and pest control.

Conclusion

This case of cooperation between El Pelón and the farmers in the agrarian reform settlements is interesting because it shows how a large private farm can take over the functions that the extension agents provided in the past, filling a void left by the public sector. The assistance that El Pelón offers is very valuable to the farmers, particularly because the MAG extension service agents and the public and private banking system now direct their attention to the development of non-traditional crops. But these arrangements are also important to El Pelón because fifteen percent of the total rice that Pelón mills and markets comes from these parcels.

Nonetheless, the informal nature of Pelón's association with the producers does not provide any certainty that this type of association could be sustainable in the long run. For one thing, the Pelón administration expressed that the hacienda is not interested in continuing with the credit provision to the farmers. "We are not a bank", they said. They expect credit markets to take over this responsibility, but without irrigation the probabilities of this happening are very slim. And without the assistance of El Pelón, it is not evident what other alternatives the small rice producers in these settlements will have to access credits and receive technical assistance. This presents a case for the non-traditional crops, an activity which evidences more favorable production conditions.

As we saw in this chapter, the production of basic grains among small farmers has serious problems of absence of credit markets and low and variable production yields as a result of planting in non-irrigated lands in a region of unpredictable climatic conditions. Although the markets are stable and secure, these adverse conditions make this activity economically unfeasible for the small producers. It is surprising to notice that, regardless of the high variability in the production yields of the rice farmers, most of them feel satisfied with their crop option, and expressed that they are not interested in producing any other crop. When asked if they had ever considered planting non-traditional products, such as cayenne pepper or others, most of them answered that that option was not possible because of their lack of irrigation. But when asked what they would plant *if* they had irrigation, most of them said: more rice.

Nonetheless, I found that despite this reluctance in moving away from the rice crop, a significant number of the farmers (10) have begun to experiment with an NTP, watermelon.

They started planting a half hectare, with low use of inputs and therefore low yield volumes. However, the fact remains that there is *still* virtually no economic activity to perform during the summer, and the farmers need to find an activity, traditional or not, to develop during the dry months. Watermelon, or another NTP, could be this activity. These findings indicate that the change towards other types of crops in the region is hardly reversible in the short run.

In the next chapter, I will study the experience of a group of farmers who started in this change process, and the problems that came up in this transition of small farmers from traditional to non-traditional agriculture.

Chapter 4

The Search for Non-Traditional Export Crops and the Design of the Cayenne Pepper Project

In this chapter I will focus on the design and implementation of the cayenne pepper project, the contractual arrangements between the producers and the processing plant, the role of the MAG, and the problems that the farmers encountered in the change process.

As seen in Chapter 2, the objective of the regional MAG offices with the non-traditional products is to find crop alternatives for the region that advance a process of regional specialization and the development of high levels of skills, technologies, and knowledge that add value to the farmers and to the products they produce. As an end result, farmers should be able to develop a new, more managerial and commercially oriented approach to farming and agriculture, which in turn should foster the development of a highly specialized and technified non-traditional export sector. This long-term vision is partly based on the arguments that Costa Ricans should be able to capitalize on the competitive advantages that they posses as a result of their political stability, rural infrastructure developments -roads, electricity, irrigation projects, and communications-, and health and education assets.

With these objectives in mind, the MAG extension agents in the province of Guanacaste search for opportunities to design and implement NTP developments among small farmers.

Designing the Project

The cayenne pepper project came out of the initiative of an agro-industrial company, PROPICA, S.A., and the Department of Research and Special Projects of the MAG in Liberia,

capital city of Guanacaste. PROPICA is a national private company that processes and exports capsicums in the form of pepper mash, mainly to the US market. They have activities in the province of Puntarenas, involving small and medium farmers in the cultivation of peppers for the production of white and black pepper and hot pepper mash. It is a medium size company and it has been exporting different varieties of peppers and capsicums since 1984.

This company, with the interest of increasing their production and export volumes of cayenne pepper mash, contacted the regional office of the MAG in Liberia with the intention of involving small farmers in the cayenne crop. They went to Guanacaste because of its climatic conditions -low relative humidity in the summer and high luminosity-, which were suitable for the crop. The Department of Research and Special Projects of the MAG-Liberia studied and accepted their proposal. The proposal consisted of a project to promote the cayenne crop among small farmers in the region, and the company PROPICA would agree to buy all the production at a fixed price in US\$. They would also provide a “proven” technological package - the same one they used in their other locality in Puntarenas-, technical assistance to the farmers, and would cover the transportation costs from Guanacaste to the processing plant in Puntarenas (a distance of 118Km).

This Department of Research and Special Projects was created by the Ministry of Agriculture with the purpose of designing and implementing the new type of all-encompassing projects (that include guaranteed market, credit provisions, a technological package and so on) for the development of NTPs. It is interesting that the direction of this Department is in the hands of a business manager, which differs from the usual direction positions in the MAG, that

are for agronomists and agronomical engineers. This is an example of how the Ministry is trying to change the orientation of its activities towards a commercial, demand oriented agriculture.

Conflict and Cooperation Among the Extension Agents

In the institutional setting of the Guanacaste extension service, the agents carry out most of their functions on the basis of their personal commitment. Even though the national government has defined policy objectives for the agricultural sector -namely, promotion of non-traditional export crops and the diversification of agro-industrial activities-, the channels through which these policies are transmitted from the central to the regional level are not formally structured. The agents in the MAG regional offices undertake specific projects on a personal account, without there being explicit guidelines that they are required to follow. They are not required either to answer to higher levels of government. Thus, they mediate in the promotion of non-traditional crops in a rather informal way, at the regional/personal level, and according to their own ideas, contacts, and opinions.

The system is loosely structured around personal relations among the agents, *técnicos*, farmers, and community members. The public sector officials who work in the MAG are usually respected figures of authority in the community, where they feel socially responsible to deliver results from their public functions. On the other hand, the farmers of the communities are also dependent on the services that the MAG offices offer. Particularly those who live in remote localities where only the agents and the *técnicos* venture, are very dependent on the projects and activities that the regional MAG office is developing. For these reasons, there is

usually a strong correlation between what the extension offices are doing and the crops in which the small farmers from a specific locality decide to participate.

In the case of the cayenne pepper project, the agents of the different towns where the project was implemented -Liberia, Bagaces, Carrillo, La Cruz, and Santa Cruz- worked together in the design and development of the project activities. These agents generally look for regional involvement, with the idea of finding a crop alternative that can be developed at the regional level. Nonetheless, there is also conflict and local competition in the extension service sector. The agents had some friction and disagreements over the decision of what crop to adopt at the regional level. For example, the MAG's of Liberia and Santa Cruz lobbied for the pepper project, but the MAG of Bagaces wanted to develop *ayotes* (a vegetable similar to pumpkins) for export. The personal stands of the MAG agents are important because the position that the local offices adopt have a decisive influence over the farmer's decision on what to plant. In this case, the MAG-Bagaces' unfavorable opinion of the pepper project resulted in that by the end of the production period all the Bagaces farmers but one -even those who had relatively successful experiences with the crop- had decided to abandon the crop.

Contractual Arrangements

The contractual arrangements between the producers and the processing plant were the following: the company provided the seed, the technological package, transportation to the plant, and technical assistance, and agreed to buy all production from the farmers at a fixed price in US dollars (\$0.25/kg); the farmers signed a contract agreeing to abide by international

regulations in fertilizer use and farming practices, and to sell all production -ripe fruits, without the peduncle, and in good state- to PROPICA.

Two NGOs provided credit for the project: ACIAR and ODRES. ACIAR provided the credit for the cantones of Bagaces, Liberia, and La Cruz, and ODRES provided the credit for Carrillo and Santa Cruz. The interest rate was 24% annually, 2 points lower than the commercial interest rate. The requisites for the credit were flexible; either owning registered property, such as a vehicle, a tractor, or a house, or presenting two co-signers who had registered property or a fixed income source. In practice, the NGOs gave most of the loans among the poor farmers on the basis of their word only, without any real guarantees¹¹. This was possible because of the strong personal trust relationships between the members of the community, in this case particularly between the MAG administrators and the NGOs administrators.

The NGOs had a limited role in the project. Its involvement was only in providing the credit. The agreement for repayment of the loan was that PROPICA would direct 50% of the payments over product delivery to ODRES and ACIAR, until the farmers had canceled the totality of the debt.

The Pepper Producers

The selection of farmers for rural development projects presents a policy problem for the public sector. The project administrators have to make a decision on whether to target the poor or target the skilled. This policy problem relates to the question of how policy makers should measure success in a project. There are several possibilities, for example, by how many

¹¹ The farmers co-signed each other's loans, regardless of having registered property or not. The NGOs were very flexible in enforcing the requirements to provide the credits, and accepted to finance all the farmers who required the loans.

producers join, by how poor are the ones that join, or by how successful the ones that join actually are, regardless of their socio-economic status. Some agents consider that they should base the selection of the farmers on people who have experience in the production of similar crops, that have minimum levels of infrastructure development in their plots, who are geographically concentrated in an area in order to reduce transportation costs, or on some other such sort of criteria.

In this case, the administrators accepted all the farmers who expressed an interest in participating in the project, regardless of experience, locality, or capital investments pre-requirements. I interviewed 25 producers of the 39 who participated in the project. Of these

25, two producers had farms relatively larger than the rest (of 36 Ha. and 110 Ha.), and 7 had non-agricultural activities as their main source of income (7)¹².

Table 5
Size of Parcels among Cayenne Farmers,
Guanacaste, 1997

| Size of Parcel | No. of Farmers |
|-------------------|----------------|
| Landless Farmers* | 10 |
| Less than 1 | 3 |
| 1-5 Ha. | 2 |
| 5-10 Ha. | 6 |
| 10-15 Ha. | 1 |
| 15-20 Ha. | 2 |
| 20-100 Ha. | 2 |

* Includes town dwellers with other sources of income (3), and sons planting in family's lands (5).

No doubt, there is some element of self-selection in these types of projects. Most farmers learned about the project through personal relationships with the MAG personnel. And all but three of the small farmers were either landholders or worked in family lands that they would inherit in the future. Of the non-owners, only two had agricultural activities as their main source of income. The rest had jobs in the towns that enabled them to pay for rented land. Also, several of the producers, particularly those from Liberia, live closer to the cantonal centers. The ownership of land and the relative proximity to more urban settings (and therefore a greater access to sources of more stable income) could be an indication of self-selection of the producers who can have access to this type of project. However, my findings show that, regardless of these indications, landlessness is not a serious problem in the zone of Guanacaste,

¹²Of these, three worked in public sector institutions, two were self-employed, -one in construction, the other in agricultural services provision-, and the other two were students supported by their parents.

and in general the project was accessible to all, including small and medium farmers, in remote or close localities.

The cayenne pepper farmers have a more diverse range of income generating activities relative to traditional farmers. This is in part a result of the proximity of a number of them to the town centers (they have greater access to employment opportunities). But even the farmers who live in remote areas tried to diversify their parcels with sugar cane, or garden vegetables, which they sell to neighboring commerces in the area, or take directly to town if there is enough production.

Table 6
Diversification of Crops among Cayenne Farmers,
Guanacaste, 1997

| No. of commercial crops | No. of Farmers |
|------------------------------|----------------|
| 1 crop (ayote or watermelon) | 4 |
| 2 crops | 4 |
| 3 crops | 4 |
| 4 or more crops | 12 |

Most farmers plant a mix of crops, some for family consumption, others for cash income. The most common crops they plant for cash are one or a mixture of the following: watermelon, corn, garden vegetables (onions, culantro, red and green peppers), rice, and sugar cane.

Table 7
Major Sources of Income of Cayenne
Farmers, Guanacaste, 1997

| Activity | No. of Farmers* |
|--------------------------|-----------------|
| watermelon | 11 |
| wage employment | 9 |
| corn | 7 |
| garden vegetables | 5 |
| cattle | 5 |
| rice | 4 |
| sugar cane | 4 |

Farmers are counted more than once to account for their different activities.

The most popular crops farmers plant for commercial purposes are watermelon and corn.

They market the watermelons either directly, by selling the fruit in stands at the sides of the highway, or they can also sell them to middlemen that go to the farms during the harvest season. The farmers plant the crop with their own resources (without credits). The assistance that they give to it depends on the resources available at the moment. The main problem with the marketing of watermelons is the rapid saturation of the markets. The local markets are very small, and when an elevated number of farmers takes to the activity, the prices of the fruit decrease rapidly. Nonetheless, watermelons are one of the few alternatives for the summer. The farmers plant them even when the profit margins are very small. Corn is also a popular crop because the farmers plant it primarily for consumption, and sell the excesses to agroindustrial. However, the profit margins for corn are also very small.

Problems with Change: Why do some farmers do better than others?

In this section, I will compare the activities of the farmers who obtained the highest output yields in the project, to analyze how the process of technological adoption takes place and what makes farmers behave so differently under analogous circumstances.

The cayenne pepper project offers a microcosmic perspective of what can happen when extension agents promote the adoption of a new crop among farmers that have traditionally planted basic grains. One of the first problems that emerged in the project was the culture of production. The farmers plant basic grains in what is typically called slash and burn agriculture. As one farmer said: “The problem is that the others [farmers] think that this is like planting rice, just throwing it in there and coming back to see it in 15 days.” The producers were accustomed to a farming method that, if labor intensive, was not attention intensive. After a farmer plants rice, corn, or beans, his or her main concern is to hope that it either rains or stops raining. But with this type of crop, the farmer has to assist his or her parcel every day.

The process for planting capsicums involves three steps. First, the producer has to plant a greenhouse, in the beginning of November, that is the end of the rainy season. Twenty-two days later, they transplant the plants to the field. Ten weeks later, they can expect the first harvest. The farmers can harvest chili peppers from February to August, which provides for a stable income source throughout most of the year, and particularly, throughout the summer, the period in which productive options are most scarce.

The cayenne project came with a “proven” technological package. This implies that all farmers who planted under similar conditions should have had similar production yields. This

was not the case. To the contrary, the yields among the farmers showed extreme variance. It is important to analyze this question of why were the levels of output among the farmers so inconsistent, because it provides relevant policy lessons for the adoption of new crops, and particularly, because it was one of the primary factors in the farmer's decision to continue with a crop or abandon it in favor of another one.

As a first point, the notion of optimal density is a good example of the cultural problems to change for non-traditional crops. With the cayenne pepper crop, the density of the plots is supposed to be of approximately 44,000 plants per hectare. But the farmers in Guanacaste were not accustomed to plant by density, or to think that a lesser number of plants would significantly decrease their output yield levels. They planted the peppers in the same way that they planted rice, or corn, or beans, by area. Some farmers said: "I don't know how many plants are in there, but I did take good care of filling the hectare." The problem is that the production costs and profits for a crop like this are calculated on the basis of the levels of output that the farmer should obtain, which by the same token, depend on the density of his or her plot. For this reason, the yields that most farmers obtained -and the profits that they made- were significantly distant from what PROPICA and the MAG agents had anticipated.

Table 8
Successful Farmers: Comparison of Yields and Production Costs, Guanacaste 1996

| Producer | Size of Plot | Size of the Loan | Density in Plants/Ha. | Kg/Plot | Kg/Ha. | Production Costs (Total)* |
|----------|--------------|------------------|-----------------------|---------|--------|---------------------------|
| Miguel | 1 Ha. | \$1,316 | 30,500 | 14,540 | 14,540 | \$3,190 |
| Pedro | 0.25 Ha. | \$658 | 44,000 | 3,415 | 13,660 | \$995 |
| Dimas | 1 Ha. | \$877 | 32,000 | 8,838 | 8,838 | \$2,243 |
| Rafael | 1 Ha. | \$1,096 | 27,000 | 3,643 | 3,643 | \$2,008 |

* Including costs of labor.

In Table 8 we see a comparison of the farmers who came close to the optimal density, which were in turn the farmers with the highest output levels in the project. The experiences of these farmers are important because they test the accuracy of the production costs and profit calculations that MAG and PROPICA elaborated, and in a broader sense, the potential of the cayenne pepper crop as a feasible economic activity.

Miguel Hernández was the producer with the highest output level. He is convinced that the cayenne pepper crop is an excellent production alternative for the small farmer in Guanacaste. On the basis of his own experience, he has calculated the production costs, average yields, and net returns from the crop. He does not have to trust PROPICA's estimates, which the other farmers considered was inaccurate and misleading, because he made his own, and found the crop to have very favorable returns. Miguel, regards his losses on the first cayenne farm as an investment in education and experience. "No business leaves you with net profits in the first year", was a phrase that he repeated several times to other farmers in group meetings. Miguel's entrepreneurial attitude and business oriented mentality are in perfect correspondence with what the MAG extension agents have in mind. He points out as the main problem with the project - not administrative or organizational problems attributable to PROPICA or MAG, or that "the price was too low"-, but that the lack of curiosity and in-farm research on the part of the farmers prevents them from achieving good results.

As an example of his innovative attitude, he separated his parcel in three plots, which he labeled A, B, and C, and developed different activities in the three to compare results. In some he applied different levels of inputs (fertilizers, pesticides), in others he altered the form and

quantity of irrigation, and in others he planted and transplanted at different stages of plant growth. With the help of the MAG regional office of Santa Cruz, he analyzed his findings, and later presented his production yields and cost estimates in the form of graphs and flow charts in the project's group meetings.

Pedro González obtained the second highest yield. This case is interesting because he planted the smallest size plot in the project. In one quarter of a hectare he obtained absolute yields higher than 14 farmers who planted one whole hectare. This could serve to support the argument that smaller plots are more productive than larger plots for some types of crops, therefore constituting an advantage for the smaller farmers (Binswanger and Elgin 1990). However, the other cases do not prove or disprove this, because most of the plots were similar sizes, and all intended to be the size of one hectare. The smaller size plots were more a result of low plant output in the greenhouse stage.

Another interesting factor in Pedro's case is that he decided not to use the entire amount of the credit available to him. He took out only half of the amount of the loan, and with this financed also the costs for some of his other crops. He was also one of the few farmers who have been able to pay back the loan, from incomes from other crops and from his son's day wages.

But the most interesting finding in this case is that, while he was relatively successful in terms of production yields, he disliked the crop and decided not to plant again. Instead, he decided to participate in a project to plant ayotes, also for export, promoted by the regional MAG office of Bagaces. He expressed that he disliked the crop because it required too much

attention, and PROPICA did not recognize this in the price that they paid. He considered that the company was not “involved” enough in the project, and was not assuming any of the risks from the new experience.

However, his main reason for abandoning the crop was the reticence of the MAG-Bagaces agents in continuing to work with the project. This is interesting because it evidences the influence that personal positions at the institutional level can have over farmers’ decisions on what to plant. In Pedro’s own words, the MAG agents are, “besides extension providers, my best friends, like part of the family”. In this sense, in the farmers perception, staying in a project that did not have the approval of his support group was disloyal. It is also contrary to the farmer’s interests. A number of farmers who liked the crop and wanted to plant it again, were unable to because the regional offices withdrew their support to the activity, which is crucial for transportation of inputs and of the product, for negotiating and administering the loans with the NGO, and for providing the necessary assistance.

Same Conditions, Different Results: Cultural Problems to Change

Pedro, Edison, and Elías are next door neighbors in La Falconiana, one of the IDA agrarian reform settlements. They planted cayenne under the same conditions in terms of soils, geographical location, timing of the production phases, and climatic conditions. Nonetheless, their results were strikingly different.

For one thing, Edison decided not to accept the loan, and plant with his own resources, which were very limited. He took this decision because he did not want to incur in loans with a product he did not know, and risk the possibility of being left with a substantial debt that he

would then have no way of re-paying. In the absence of financial resources for the production of the crop, he decided to alter the technological package, substituting inputs use in kind and quantity. Moreover, he did not know the density of his parcel, and had trouble recalling the dates on which he started planting, transplanting, and harvesting. His answers to many of my questions were: "Ask Pedro, he's the one who writes everything down. We all did what he was doing.". But when we compare their performances, it seems that they did not do *all* that Pedro was doing.

Table 9
Comparison of Yields and Production Costs of Three Neighboring Farmers in La Falconiana, Bagaces, 1996

| Producer | Size of Plot | Loan | Density in Plants/Ha. | Kg/Plot | Kg/Ha. | Amount Spent* |
|---------------|--------------|-------|-----------------------|---------|--------|---------------|
| Pedro | 0.25 Ha. | \$658 | 11,000 | 3,415 | 13,660 | \$329 |
| Edison | 0.50 Ha. | \$0 | ?15,000 | 544 | 1,088 | \$175 |
| Elias | 0.50 Ha. | \$417 | unknown | 922 | 1,844 | \$417 |

*Does not include family labor expenses.

The three cases employed only family labor and spent a comparable amount of person/hr. in the different tasks of the production process. Nonetheless, while Pedro could recall without difficulty the timing of the phases, the density of his plot, and his production yields, Edison and Elias gave very inaccurate answers to these questions. For example, Edison estimated an output of 4,700Kg, when what he produced was 544Kg. Similarly, Elias thought he might have produced 250Kg, compared to the 922Kg he actually delivered. Nonetheless, they both considered that their parcels had produced well, and that the only problem with the project was that "the price was too low".

This examples serve to make a case for the potential for success of NTPs. The yields for cayenne varied substantially from farmer to farmer. But in this case, the farmers were

producing under similar conditions, or in any case under conditions very easy to make equal. That is to say, with the credit provisions and the technical assistance that the MAG and the company provide, the farmers can install drip irrigation, apply the required amounts of fertilizers and pesticides, and administer the same types of tasks and labor. This suggests that agents and producers could succeed in reducing the erratic variations in yield in future years, as farmers and extension service providers acquire knowledge of the crop and are able to control for differentiating factors. This is very different from the case of the production of basic grains. In that case, the possibilities of success for small farmers are very limited relative to those of non-traditional farmers. The farming method (non-irrigated), the absence of credits, and the indifference of the extensions service providers puts farmers involved in traditional agriculture at a disadvantage.

Conclusion

In the absence of links between the private agro-industrial companies and the farmers, the MAG plays a crucial mediating role between the sellers and the buyers. The farmers lack the managerial skills to asses the market situation and elaborate the necessary studies. In this case, the MAG elaborated all pertinent financial studies. It also secured the financial credit sources for the project. Personal relations between the MAG representatives and the NGOs played a decisive role in the decision to provide the credit for the project. Moreover, MAG has stood with the interests of the small farmers and acted as a mediator with the private enterprise, watching that the company complies with the clauses of the contracts, and trying to negotiate better terms of trade for the agricultural producers. The negotiating power of the farmers is

small, because they do not know the demand conditions, the prices, or the international market situation. This type of information is more accessible to the MAG agents than to the small producers.

The farmers had numerous technical problems in terms of the irrigation system, pests and plagues, and use of fertilizer. They had the custom of planting crops such as rice and corn, what is locally known as “la cultura de volar machete” (the culture of slashing everything down with a machete). From slash and burn to providing attention plant by plant was a big change. For some, it was their first time working with an irrigation system, or having to apply a technological package with exact measures. However, these problems are potentially solvable as both producers and agents acquire a better knowledge of the crop.

In the next chapter, I compare the relative conditions of farmers producing traditional agriculture and farmers who have changed to non-traditional export crops, to analyze which groups are better off on the basis of the set of criteria explained in chapter 1.

Chapter V

Comparison of the Performance of Rice and Cayenne Producers

In this chapter I will compare the performance of traditional and non-traditional farmers to determine what are the relative advantages and disadvantages of engaging in both sets of activities. I will make this comparison on the basis of the following criteria: 1) levels and stability of incomes; 2) the relationship between the size of the farms and productivity, and the relative uses of labor and capital; 3) the development of human capital and transfer of technology; 4) the technical and logistical support from the public and private sector; 5) the availability and conditions of the credit markets; and 6) the uses the producers give to excess income and their possibilities for savings.

Levels and Stability of Incomes

It is difficult to compare the income generating capacity of the NTP in this case because the project to plant cayenne pepper has been in effect for only two years. The initial process of learning alters the perceptions of the real possibilities of extra income that the producers can obtain from the cayenne pepper. Nonetheless, I will calculate the projected future incomes from the crop, on the basis of the past experiences of the farmers who kept detailed accounts of their expenses and revenues.

On the basis of my sample, and making a rather broad generalization, we can calculate that small rice producers in this region with a level of rainfall in the winter on the order of 1.500 to 2.000mm, -what is considered a “good winter”- can obtain net incomes of approximately

US\$351/Ha.¹³. This is from an optimistic perspective, estimating an output yield of 28 sacks/Ha.¹⁴ If they plant 7 Ha., roughly the average area planted in my sample, this yields a total of US\$2,456.

For the case of cayenne pepper, assuming that the farmer plants one hectare, with an adequate density of plants of 44,000 plants per hectare, and on the basis of 1996's average production costs, his or her yields would be of about 1.5MT, or \$1,233 at the current price of US\$0.30/Kg. That is to say, \$1,233/Ha. of peppers, compared to \$351/Ha. of rice. In short, a farmer with one hectare of cayenne peppers could easily receive as much net income as a farmer with 3.5 hectares of rice. In reality, one would expect the differences in net incomes to be even higher, if one considers that the rice production yields in the absence of irrigation in this region are highly unreliable, and "good winters", a rare occurrence.

These figures clearly indicate higher returns for cayenne pepper than for rice. But more important than these numbers, the incomes from cayenne pepper are spread out over a harvest period from February to August. The harvest can be extended year long if the transplants are phased¹⁵. This represents a great advantage over rice, which harvest yields are one lump some once a year.

Size of Farm and Productivity: Relative Uses of Labor and Capital

Medium and large rice producers in Guanacaste are more efficient than the small rice producers. This difference in efficiency stems mainly from the fact that most small farmers lack

¹³At the exchange rate of ₡228=US\$1 (January 1997).

¹⁴The average output per Ha. in my sample of rice farmers was of 28 sacks/Ha.

¹⁵The transplants are not phased at present, as the crop is still very experimental, but phasing the production process to make it year-long should not present any major problems. It would require coordination between the producers and the processing plant, but both parts have expressed a strong interest in this possibility for the future.

irrigation, and irrigation is necessary to regulate the output yields in rice production. Therefore, small rice farmers that plant in non-irrigated lands: a) have highly variable production yields depending on the levels of rainfall, and b) cannot access the credit market because commercial banks only give out loans for irrigated agriculture. Furthermore, the larger size farms benefit from economies of scale in the production of rice. Medium and large rice farmers employ a more capital intensive technology, in which they are able to substitute labor for machinery. The use of these inputs increases their output yields. The cost of this technology for smaller size farms is prohibitively expensive.

Contrary to the case of rice, my findings indicate that the cayenne crop is more productive in smaller farms than in larger farms. The crop is very labor and attention intensive, and in a larger area it would be more difficult to provide it with the necessary assistance. Moreover, small farms that employ mainly family labor make a more productive use of the labor factor. As other research studies have documented, family workers tend to be cheaper and more efficient than hired workers (Binswanger and Rosenzweig 1986, Binswanger and Elgin 1990). This is partly because family members receive a share of the profits and share a part of the risk, and therefore they have higher incentives than hired wage workers to do more and better quality work for the same given supervision.

Developing Human Capital and Transferring Technology

The levels of technology employed in small and medium-large rice farms are very different. On the first case, the technology is based on abundant manual labor and low use of capital investments. In the second case, the opposite occurs. Therefore, at the technological

levels that are accessible to small farmers, the possibilities for technological transfers between small and large rice farmers are limited. The production of basic grains is through traditional technology that small farmers know very well. The room for acquiring new skills and technologies is restricted.

For the case of cayenne, I found that PROPICA's pepper plantations in San Carlos, the location where they have the other pepper plantations and where the processing plant is situated, they apply the same technological levels that the farmers in Guanacaste. In this sense, there is a transfer of technology from the agro-industrial sector to the small farmers. The transfer of technology is embedded in the technological package, the provision of the seeds, and the technical assistance that the PROPICA engineers provide to the cayenne producers. The farmers are able to increase the human resource by acquiring new skills, information, and knowledge.

Another central issue is the development of human capital through a change in the culture of production, the idea being that farmers are able to develop a more entrepreneurial mentality to farming. I found this to be true for the case of the cayenne farmers. Some of them expressed that it was the first time that they had had to keep records of all their expenses and information on their farming system (such as the density of the parcel, the amount of fertilizer she applied, the dates of the transplants, etc.) This behavior is helpful to build on past experiences and particularly to mature the ability of assessing the costs and benefits to a product when the farmers are presented with different production alternatives.

Technical and Logistical Support

The MAG extension service in Guanacaste is a key element to the activities of small farmers in the region. There is a strong commitment to the success of the projects, fortified by personal ties and friendship between the farmers and the extension agents. Some extension agents in the MAG do work mainly with traditional agriculture. But they focus their efforts towards the middle and large producers and rice mills in the zone because that is where the research takes place, the producers pay them directly for their services, and they do not believe that non-irrigated rice production has success possibilities as an economic activity.

Contrary to this, small farmers are the main concern of the Department of Research and Special Projects in Liberia. The central MAG created this Department with the specific objective of developing economically viable projects for the small farmers in the region. Thus, the Department orients the greater part of its efforts towards the research of markets, sources for financial credit, and finding crop alternatives that the small farmers can adopt at the regional level. The regional dimension is an important variable in understanding the MAG agents and administrators drive and commitment to their work with small farmers. It is part of the regional identity that sets the Northwestern region of Costa Rica away from the rest of the country. The MAG agents, the producers, and the local leaders, all referred to the importance of finding a *regional* crop alternative, that is, a crop that the farmers can adopt at a regional level¹⁶.

¹⁶The answer of several farmers to the question of why they decided to plant cayenne pepper was that they wanted to find a crop that was good for the region, so that they could share it with the neighboring farmers and they could all plant the same crop. The concept of regional development, and of working together in the same sort of economic activity, was very present in the mind-sets of most producers and agents.

The hacienda Pelón also provides assistance that is important to the neighboring farmers. Nonetheless, this is a particular situation, almost a historical accident, and does not serve to make generalizations. Moreover, the rice farmers do not need technical assistance as much as the NTP farmers, because the first have a long experience with the rice crop in the region.

The Credit Markets

National credit policies favor NTP and disincentive the production of basic grains. The credit options for the small rice producers are scarcer every day. There is also a point to be made about farmers going to where the credits are. If the credit options are going to be in the non-traditional crops, it is going to be difficult for farmers to remain in basic grains.

For the case of NTPs, the MAG agents are able to secure credits for the projects from NGOs and from other sources such as international grants. This is to a great extent a result of the fact that the national credit policies favor NTPs. But it is also a function of the personal close relationships that the MAG administrators have with some of the credit providing entities, such as the two NGOs in this case. These relationships evolved in the course of living and working in the same communities and with the same target population, the small farmers. In this sense, there is a coincidence of interests between the credit policy goals, the objectives of the MAG agents, and the projects that benefit small farmers.

Excess Income and the Possibilities for Savings

In terms of the opportunities of savings presented to the producers from both activities, it appears that NTP farmers have a greater concern of saving than the traditional farmers.

NTP farmers have saving very present in their minds. This could partly respond to the fact that the NTP farmer population is in general “more urban” than the traditional farmers. They live closer to the town areas and several of them have stable jobs that provide them with a fixed salary every month. Regardless, it is evident that NTPs excite greater expectations among the farmers than the production of basic grains. In accordance to this, most of the cayenne farmers had higher expectations of being able to save in the near future.

Both sets of farmers do similar things with their income excesses, namely, buy a farm animal, or make improvements in the house or on the business. However, the basic grains producers save less in cash than the NTP farmers. Only nine rice farmers save in cash. The other sixteen farmers did not save, had never saved, nor had major expectations of being able to save in the near future. When asked what they did with their income returns, most expressed that the money went to buy more food, and there were practically no excesses that they could save or re-invest. Of the NTP farmers, only two out of 25 had never saved nor expressed expectations of being able to do it in the future. This patterns indicate a greater preoccupation with saving on the part of the NTP farmers.

Conclusions

The incomes for farmers who plant cayenne pepper are more stable than those of farmers who plant basic food grains. For the latter, most of whom plant without irrigation, income is concentrated in the profits from the production in the rainy season. During the summer, most producers have no income source, unless they employ themselves as wage day-workers in nearby farms. But the demand for jobs greatly exceeds the demand for day-workers. One

option is to emigrate to other regions of the country and work, for example, in banana plantations, but farmers do not like to take this route. It implies leaving their families for several months and living in very uncomfortable conditions.

Even when most NTP farmers expressed a strong preference towards NTPs in general over basic grains, a limited number of them (5) still stated that they preferred the basic grains option. They said: "there is nothing like grains, but we can't plant them anymore because the

government took away the market”¹⁷. In fact, when the national agricultural policies favored the basic grains producers with credit policies, floor prices, and guaranteed markets, traditional agriculture was a feasible economic option. But at present, the opinion of most farmers regarding the production of basic grains - “with traditional products we are not going to get anywhere, they are only to get by, but they will never better our living conditions”- seems very accurate.

Table 10
Comparison of Net Profits for One Hectare of Rice, Beans, Corn, and Cayenne Pepper in Guanacaste, 1996

| Crop | Net Profits |
|---------|-------------|
| Rice | \$351 |
| Corn | \$231 |
| Beans | \$64 |
| Cayenne | \$1,233 |

*In non-irrigated lands, using manual labor, and limited mechanization for rice and corn.

Source: Estimates from the Ministry of Agriculture and Livestock, Department of Research and Special Projects, 1996 and from my field research.

On another point, the production of a crop that such as cayenne pepper has relatively high returns to land favors the landless rural producers more than rice and other basic food grains. As we can see in Table 10, the returns to land from basic grains is much lower than for cayenne (and other NTPs). This explains why most of the rice farmers are landowners, as opposed to land-renters. On the other hand, many cayenne farmers are land-renters. They are able to rent land because cayenne yields higher profits and because it has lower land requirements (requires renting only one hectare, compared to around seven to ten for rice production). It is not surprising then that town dwellers, most of them landless, prefer NTPs to

¹⁷With this, they were referring to the times (before the late 1980's) when the government had fixed floor prices for

foodgrains. They can obtain higher returns from a smaller number of hectareage. In this sense, NTPs have the benefit that they can be more accessible to farmers located closer to the urban centers. These farmers tend to have less access to land, both because of quantity (less agricultural land available) and because of the cost of renting and owning land (higher land prices) in these localities.

Finally, one of the basic reasons that explain why the yields from the cayenne crop presented such high levels of variance was the input substitution behavior of the farmers in the production process. Farmers in traditional agriculture are accustomed to make economic decisions at the margins on the use of key inputs such as fertilizer. In the absence of cash resources, farmers will economize in input use with a consequential decrease in production yields. This substitution behavior can be efficient when the farmers have experience with a crop, such as in the case of rice and basic grains. But applied to a new crop, it had negative consequences and ultimately resulted in the highly unsteady yields. In the first place, they did not know the crop well enough to know what were the minimum possible applications of these inputs. In the second place, the agents and PROPICA calculated profit on the basis of specific densities and expected yields for each parcel. The alterations to the technological package were one of the reasons why some farmers were very distant from the expected output (and profit) levels. Even when agricultural technology is location specific and there is certainly room for adaptation of the package to the local conditions, this adaptation should take time and be done in

basic grains, favorable credit policies for the production of these crops, and a State marketing board, the Consejo Nacional de Producción, which purchased the small farm production.

a gradual way. Otherwise, this irregular experimentation may pose a threat to the households' minimum subsistence requirements.

Chapter 6

Conclusions and Policy Recommendations

This thesis has focused on the lessons for program design and implementation provided by the experience of the transition of a group of farmers in the province of Guanacaste, Costa Rica, from traditional agriculture to non-traditional export crops.

Analysts studying agricultural export booms in Latin America have found that the effects that these export-led growth strategies can have on rural poverty depend on the specific characteristics of the crops promoted and on the government policies that affect the microeconomics of the specific crops involved (Barham 1995, Carter and Mesbah 1993, Carter 1995). In the case of Costa Rica, the evidence from this study and from previous research shows also that the social structure in which these (and any other) types of policies are pursued, are a major determinant of the nature of the consequences that these types of measures will have over the social and economic conditions of the rural poor (Brockett, 1997). Policy makers and government officials cannot apply non-traditional export crops as a recipe for poverty reduction. They need to analyze the different crop alternatives on an individual basis, in order to determine whether their farming method, production structure, and level of technology are suitable to the specific local conditions. This analysis will enable the policy makers to determine the real possibilities of success for different agricultural projects.

Through my research, I was able to determine a series of crucial decision criteria for measuring the success possibilities of export crop projects for the rural poor. These are:

1) The organizational capabilities of the administrators involved in the project-

Evidently, organizational skills and leadership capabilities are a key ingredient for the success of any type of project. In the absence of structured organizational institutions for farmers' participation, the public sector has an important role to play in providing the administrative structure and the organizational capabilities necessary for the success of the agro-export initiatives. In the case of this study, the extension agents were able to coordinate the different aspects of the production and marketing structure, i.e., credit contracts, transportation of the product, and negotiations with the agro-industrial company, among others.

2) The institutional support from the public sector authorities- The support of the

public sector is particularly important for projects that are aimed at small farmers and the rural poor, because these groups lack the knowledge of market conditions and organizational structures to generate these sorts of projects through their own initiatives. The types of support that the public sector needs to provide will depend on the specific local necessities. These can be in agricultural extension, in developing organizational capability, or in directing financial credit sources, among others. In any case, it is necessary that the extent of the involvement of the public sector does not surpass the real necessities of the local conditions, as these public services also have costs which have to be considered.

3) The links with the private sector- The links with the private sector are central to the

success of the projects because the private companies have the markets and posses the technologies to make the production processes work. They can also provide for stable and relatively secure markets. Even when the prices that farmers receive for their products tend to

be relatively lower in these types of fixed marketing arrangements, these contracts have important positive outcomes for the stability of their incomes.

4) The accessibility of the technology- The characteristics of the new technologies have to be adaptable to the local conditions for the farmers to adopt it. If the technologies of the agro-export crops that the projects promote are labor displacing, or favor the concentration of land, the development model will evidently have negative effects for the rural poor. Nonetheless, the evidence shows that it is feasible to find NTPs which are suited for small farm developments, and which emphasize investments in the abundant resource (usually labor) instead of in the scarce one (usually capital).

5) The availability of financial credit resources- Credit policies are an important way in which the national authorities incentive and disincentive agricultural activities. In the case of Costa Rica, and specifically of the small farmers in Guanacaste, the effects of the national credit policies are evident. The areas in cultivation for basic grains have experienced considerable reductions in the last few years¹⁸, while the areas in production of NTPs have gradually increased. This has been a result of the policies that government and non-government institutions have enacted towards the promotion of NTPs through the provision of subsidized credits for the production of these crops.

6) The availability and productivity of the labor force- The government of Costa Rica has invested substantially in public works for the rural sector. These massive investments are evident in infrastructure, education, and social services. These policies have provided for a

¹⁸ For beans, the areas in cultivation went from 57,447 Ha. in 1994-95 to 33,160 Ha. in 1995-96, and for corn, from 18,109 Ha. to 12,489 for the same period (MAG 1997).

social, economic, and political setting of relative homogeneity and limited inequality. But at the same time, it has also had positive effects over the quality of the rural work force, and the development of human capital. Costa Rican rural workers benefit from education levels relatively high compared to those in the other Central American countries, and this condition allows them to absorb the new technologies in a more rapid and efficient way.

The study of the NTP project in this research indicates that export crops can have positive effects for the rural poor if the scale of the technology that farmers use to produce them is appropriate to the local conditions. Moreover, it serves to demonstrate how small size farms can be more productive than larger sized farms in cases when the technology is labor intensive. This responds to the fact that their use of the labor factor is more productive, because family labor in general is more productive than hired labor (Binswanger and Elgin 1990)¹⁹. This study also reveals several interesting characteristics of the transition from traditional agriculture to NTPs:

1. The income levels of the farmers who switched from traditional agriculture to NTPs did not change significantly. However, farmers who made the switch to NTPs tended to have a more diverse range of income generating activities even before participating in the cayenne pepper project. This evidences some element of self-selection in farmers who participate in NTP projects. A number of cayenne pepper farmers also lived closer to the town areas and thus had a wider spectrum of economic opportunities. However, one can also make the argument that some farmers are naturally more innovating than others, or have a more commercially oriented

¹⁹ Family labor is more productive than hired labor because the workers share in the profits and the risks from the work they perform, and therefore have higher incentives to perform more and better work for the same given level of supervision than hired laborers.

attitude. In this sense, the fact that farmers in the NTPs have higher incomes from the start does not mean that NTPs are inaccessible for farmers below a certain socio-economic level. Rather, it poses a policy question on how public sector institutions can approach the farmers who present a more conformist behavior in relation to their production alternatives.

2. The economic benefits from planting non-traditional export crops do not necessarily stem from the fact that the prices for these types of product are higher relative to the prices of products for the local or domestic market. All peasant agriculture is relatively handicapped, compared to the economic activities in the modern sector (Mynt 1979). Nonetheless, peasant export production under free market conditions is favored compared to subsistence production and to cash production of food crops for the local or domestic market. The advantage arises from the fact that non-traditional exports are better served with marketing, transport, and credit facilities than are cash crops for the local market.

3- Most farmers who made the shift from traditional agriculture to the non-traditional export crop -cayenne pepper- decided not to plant the same crop for a second time. This was true even for some of the farmers who obtained high levels of output within the project. Nonetheless, their decision was not based on a desire to go back to traditional crops, but rather to find another NTP that was *better*. The farmers perceive this crop shifting behavior as a way of diversifying their risks and increasing their probabilities of success from agricultural activities. However, they are also dissipating the specific skills, knowledge, and experiences that they have acquired during the production process. They are aware of the value of the experience acquired, and of the costs of that acquisition. Yet with NTPs the farmers' expectations of immediate

profits are higher than with traditional agriculture. The producers express more impatience in waiting for the returns to their investment. Moreover, with different crop options leaping up everyday, and with extension agents searching for bigger and better projects, agricultural producers are easily convinced of turning over one crop for another.

6- Most farmers place a high value on the advice of the extension agents. Loyalty to the project that their regional office is promoting is an important factor for the decision on what to plant. The competitiveness within the MAG institutional system is expressed at a very personal level. The agents claim ownership of the projects at the local town level, and this generates intra-regional conflicts for project implementation. The agents prefer to participate in projects that originate in their own office, as opposed to participating in the projects developed by the other localities.

On the other hand, it was interesting to find that the levels of commitment of the public servers were considerably high, even in the absence of effective incentive and sanctions mechanisms to reward or penalize the administrators for their contributions. The agents were strongly committed to the activities of the small farmers and the concerns of the communities of which they formed a part. This is contradictory to the common wisdom about public sector workers, which considers that personalism at the local government level has negative outcomes for outspread poverty reduction programs.

Finally, regarding small farm production of rice, corn, and beans, these activities have historically been characterized by low productivity, scarce transfers of technology, absence of credit and insurance markets, and low usage of improved seeds. However, the government's

intervention in the rural sector helped to maintain for many years a security net for poor farmers, which included redistribution of land, subsidized credits, technical assistance, and floor prices for rice, beans, and corn. Notwithstanding the low levels of productivity in the basic grains sector, transferring all the productive resources from traditional to non-traditional agriculture could be very costly from the socio-political perspective. The production of basic grains is also related to the problem of macro-food security. Macro-food security is a priority for all governments, as it has important effects over the political stability of the country. Conserving political stability has historically been an important priority in the Costa Rican governments. The benevolent nature of agrarian policies in the past are one of the factors that explain why Costa Rica experienced social and political tranquillity in the rural sector, while the neighboring Central American republics lived through decades of violence and war in the countryside.

A six-nation study of a diverse set of Third World countries published in 1980 found Costa Rica and Taiwan unique in having successfully combined rapid economic growth with declining inequality. The author concluded that perhaps a distributionally oriented development program that integrates the poor into the mainstream of the economy may cause a higher growth rate, other things being equal" (Gary Fields (1980). Poverty, Inequality, and Development. NY: Cambridge University Press, p. 241). Costa Rica has maintained the best performing economy in Central America since 1980, validating the critical point -as have the performance of the Asian success stories- that, not only do equitable growth strategies do less harm to the poor, but they also produce better for the whole of society (Brockett, 1997). In this sense, and considering the

high proportion of small farmers involved in traditional activities, before the government authorities can totally disincentive the production of basic grains, they need to find ways to incorporate the small grain producers into other production alternatives.

References

- Ahmed, Iftikhan and Vernon Ruttan, eds. *Generation and Diffusion of Agricultural Innovation: The Role of Institutional Actors.* Gower: Aldershot, 1988.
- Anderson, Leslie E. *The Political Ecology of the Modern Peasant: Calculation Community.* Baltimore: Johns Hopkins University Press, 1994.
- Barham, Bradford, et. al., “Nontraditional Agricultural Exports in Latin America”, in: *Latin American Research Review*, vol. 27, no. 2, 1992.
- Barlett, Peggy. *Agricultural Choice and Change: Decision Making in a Costa Rican Community.* New Brunswick, N.J.: Rutgers University Press, 1982.
- Binswanger, Hans P. and Miranda Elgin. “Reflections on Land Reform and Farm Size,” in: *Agricultural Development in the Third World.* ed. by Carl K. Eicher and John M. Staatz. 2 ed. The John Hopkins Studies in Development, Maryland: The John Hopkins University Press, 1990.
- Binswanger, Hans P. and M.R. Rosenzweig. “Behavioral and Material Determinants of Production Relations in Agriculture”, in: *Journal of Development Studies* 22, no. 3 (April), 1986.
- Binswanger, Hans P. and Vernon W. Ruttan, and Uri Ben-Zion (et al.). *Induced innovation: technology, institutions, and development.* Baltimore: Johns Hopkins University Press, 1978.
- Brockett, Charles D. *The Agro-Export Development Model in Central America: An Assessment of Recent Trends.* Department of Political Science, University of the South Sewanee. Paper prepared for delivery at the 1997 meeting of the Latin American Studies Association, Guadalajara, México, April 17-19, 1997.
- Carter, Michael, Barham, Bradford, and Mesbah, Dinah. “Agricultural Export Booms and the Rural Resource Poor in Chile, Guatemala, and Paraguay,” in: *Latin American Research Review*, 1995.
- Carter, Michael, Mesbah, Dinah. Can Land Market Reform Mitigate the Exclusionary Aspects of Rapid Agro-Export Growth? in: *World Development* 21, 1993.
- Damiani, Octavio. *Agroexport Boom and “Inclusionary” Growth: The Case of Petrolina-Juazeiro in Northeast Brazil.* Ph.D. Dissertation Proposal. Department of Urban Studies and Planning. MIT, 1996.

Feder Gr. R. E. Just and D. Zilberman. "Adoption of Agricultural Innovations in Developing Countries: A Survey" in: Economic Development and Cultural Change, Vol. 33, No. 2 (April), 1985.

Gotsch, Carl. "Technical change and the distribution of income in rural areas," in: American Journal of Agricultural Economics, 54:2:326-341, 1972.

Guzmán, Juany and Victoria Naranjo. La Política Arrocera en Costa Rica. Thesis in Political Science, Universidad de Costa Rica, 1988.

Guzmán, Juany. La Sociedad Civil ante el Ajuste Económico: Los Productores de Granos Básicos en Costa Rica 1982-1990. Master's Thesis in Political Science. Universidad Complutense de Madrid, 1993.

Hazell, Peter B.R. and Alisa Röell. Rural Growth Linkages: Household Expenditure Pattern in Malaysia and Nigeria. Washington, DC: Research Report/ International Food Policy Research Institute; 41. September, 1983.

Helwege, Ann and Towney, Michael J. Modernization and Stagnation: Latin American Agriculture into the 1990s. New York: Greenwood Press, 1991.

Lipsky, Michael. "Training and the Management of Discretion Among Public Employees: The Perspective of Field-Based Bureaucracy". Paper prepared for the conference on Jornadas Internacionales de Adiestramiento. Caracas, Venezuela, June 27-July 2, 1989.

Lipton, Michael and Richard Longhurst. New Seeds and Poor People. Baltimore, MD: The John Hopkins University Press. The John Hopkins Studies in Development, 1989.

Myint, Hla. "Exports and Economic Development of Less Developed Countries", in: Economic Growth and Resources, Vol. 4: National and International Policies, ed. by Irma Adelman. Sr. Martin's Press, New York, 1979.

Niskanen, W. A. The peculiar economics of Bureaucracy. American Economic Review 58 (2): 293-305, 1968.

Rhee, Yung W. Export catalysts in low-income countries: a review of eleven success stories Washington, D.C.: World Bank. World Bank discussion papers; 72, 1990.

Ranis, Gustav and Stewart, Frances. Rural Linkages in the Philippines and Taiwan. In: Macroeconomic Policies for Appropriate Technology in Developing Countries. New York: Westview Press, 1987.

Ruttan, Vernon. "How the World Feeds itself," in: Society 17, no. 6. Transaction Publishers, 1980.

Ruttan, Vernon and Yujiro Hayami. "Induced Innovation Model of Agricultural Development", in: Agricultural Development in the Third World. ed. by Carl K. Eicher and John M. Staatz. 2 ed. The John Hopkins Studies in Development, Maryland: The John Hopkins University Press, 1990.

Staatz, John and Eicher Carl. "Agricultural Development Ideas in Historical Perspective," in: Agricultural Development in the Third World. ed. by Carl K. Eicher and John M. Staatz. 2 ed. The John Hopkins Studies in Development, Maryland: The John Hopkins University Press, 1990.

Stanley, Denise. "The Welfare Effects of an Export Boom: Land Enclosure and Labor Market Segmentation in Honduras." Paper prepared for the Latin American Studies Association Conference, 1994.

Tendler, Judith. "Tales of Dissemination in Small-farm Agriculture: Lessons for Institutions Builders", in: World Development vol. 21 No. 10, pp. 1567-1582, 1980.

Timmer, Peter. The Agricultural Transformation. in: Agricultural Development in the Third World. ed. by Carl K. Eicher and John M. Staatz. 2 ed. The John Hopkins Studies in Development, Maryland: The John Hopkins University Press, 1990.