

LEARNING FROM COLLECTIVE EXPERIENCE:  
SUCCESSFUL SMALL FARMER ASSOCIATIONS IN NORTHEAST BRAZIL

by  
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**Submitted to the Department of Urban Studies and Planning in June 1993  
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**ABSTRACT**

Both governments and international donors have long used farmer associations as a way of promoting rural development and directing benefits to the rural poor in developing countries. Although this remains still as a popular policy, the literature stresses that farmer associations often do not work well. The majority of this literature tends to emphasize this fact rather than analyzing situations in which this policy has been successful. This thesis, therefore, focuses not on the problems of farmer associations, but on what, how, and why a set of three small farmer associations in the state of Ceará in Northeast Brazil did well. Located in the poorest region of the country, all these farmer associations received major funding from government programs. But in contrast to what happens in Ceará and elsewhere, the poor members in the three associations discussed dominated in decision-making. The poor farmers received significant benefits in the form of services, and the associations were able to recover part of the costs of the services they provided. In addition, one association was successful in agricultural production.

The analysis of this case study concludes providing lessons for agricultural policy, and for program design and implementation.

Thesis supervisor: Judith Tendler  
Professor of Political Economy

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## LIST OF ACRONYMS

<b>BNB</b>	<b>Banco do Nordeste do Brasil</b> <b>(Bank of the Northeast Brazil)</b>
<b>CCA</b>	<b>Cooperativa Central dos Assentamentos da Reforma Agraria</b> <b>(Central Cooperative of Agrarian Reform Settlements)</b>
<b>CEB</b>	<b>Comunidades Eclesiais de Base</b> <b>(Christian Base Communities)</b>
<b>CEPA</b>	<b>Comissão Estadual de Planejamento Agrícola</b> <b>(State Commission of Agricultural Planning)</b>
<b>COAPEC</b>	<b>Cooperativa Agropecuária de Piquet Carneiro (Agricultural</b> <b>Cooperative of Piquet Carneiro)</b>
<b>COSENA</b>	<b>Cooperativa Agropecuária de Senador Pompeu</b> <b>(Agricultural Cooperative of Senador Pompeu)</b>
<b>EMATERCE</b>	<b>Emprêsa de Assistência Técnica e Extensão Rural do Ceará</b> <b>(Ceará Technical Assistance and Rural Extension Agency)</b>
<b>EPACE</b>	<b>Empresa de Pesquisa Agropecuária do Ceará</b> <b>(Ceará Agricultural Research Agency)</b>
<b>FNE</b>	<b>Fundo Constitucional de Financiamento do Nordeste</b> <b>(Constitutional Fund for the Northeast)</b>
<b>IBGE</b>	<b>Instituto Brasileiro de Geografia e Estadística</b> <b>(Brazilian Institute of Geography and Statistics)</b>

<b>INCRA</b>	<b>Instituto Nacional de Colonização e Reforma Agrária (National Institute of Colonization and Agrarian Reform)</b>
<b>IPLANCE</b>	<b>Instituto de Planejamento do Ceará (Planning Institute of Ceará)</b>
<b>MST</b>	<b>Movimento dos Sem Terra (Landless Rural Workers' Movement)</b>
<b>OCEC</b>	<b>Organização das Cooperativas do Estado do Ceará (Ceará Organization of Cooperatives)</b>
<b>PAPP</b>	<b>Programa de Apoio ao Pequeno Produtor Rural (Program for the Support of Small Farmers)</b>
<b>POLONORDESTE</b>	<b>Programa de Desenvolvimento de Areas Integradas do Nordeste (Development Program for Integrated Areas of the Northeast)</b>
<b>PROCERA</b>	<b>Programa de Crédito Especial para a Reforma Agrária (Program of Special Credit for Agrarian Reform)</b>
<b>SEPLAN</b>	<b>Secretaria de Planejamento do Estado do Ceará (State of Ceará's Secretariat of Planning)</b>

## CHAPTER 1

### INTRODUCTION

Most of the agricultural and rural development literature stresses the problems of farmer associations<sup>1</sup> and the limited benefits that they provide to the smaller farmers. A small group of large farmers often dominate the associations and benefit most from association services like credit and extension services (Attwood 1987, Fox & Hernández 1989, Lele 1981, Peek 1988, Peterson 1982). Financial problems often plague farmer associations due to frequent mismanagement (Tendler 1983 & 1984) and to the difficulty of controlling "free riders" who receive benefits without contributing to the costs of providing them (Ostrom 1990). These obstacles are so serious that many policy-makers in developing countries challenge the idea of promoting farmer associations as an instrument for rural development and the alleviation of rural poverty. Is it possible for farmer associations to overcome the above-mentioned problems and benefit the poorest members? Can they be appropriate instruments of poverty alleviation policies? This thesis will help answer these questions by focusing on the lessons provided by the accomplishments of three small farmer associations in the state of Ceará in Northeast Brazil, one of the poorest regions in the world. These associations have succeeded in many ways.

First, these associations provide significant benefits to their poorer members,

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<sup>1</sup> I use the term farmer association to define organizations in which their members are agricultural producers who join to pursue objectives of collective interest. These organizations may have different objectives, from selling their individual crops to producing collectively. They may undertake different tasks, from interest group representation to marketing and provision of services to members and non-members. They may have different legal status, ranging from informal groups to registered cooperatives.

such as rental services of machinery too expensive for them to purchase, and credit for working capital in the periods in which the poorer members have no other income. This is unusual because, elsewhere, farmer associations' services often benefit the larger members rather than the small ones (Attwood & Baviskar 1987, Fox & Hernández 1989, Tandler 1983 & 1984). Most importantly, the poorer farmers do not perceive these services as favors from the cooperatives' leaders and managers--as it happens elsewhere in Northeast Brazil--but as their rights as co-op members.

Second, the leadership of these associations comprises the poorer farmers. This contradicts what happens in most farmer associations elsewhere, which are usually controlled by the richer members (Attwood 1987, Fox & Hernández 1989, Lele 1981, Peek 1988, Peterson 1982, Tandler 1983 & 1984). Most interestingly, the smaller farmers took over the control of their associations in the middle 1980s after a struggle with entrenched leadership from the large farmers. This is uncommon in Northeast Brazil and elsewhere because the poor members are often weak and unable to organize (Korten 1980). In addition, the change in the associations' leadership relates to an educational component of a government program. This is also interesting because educational programs often fail for facing opposition from the rural elites (Tandler 1982 & 1991).

Third, the three associations have partially recovered the cost of some of their services by charging fees for specific tasks. This is striking because cost recovery is a typical problem with all small farmer associations for two reasons: a) most of their members are too poor to pay, and b) politicians also find it hard to insist on cost



recovery of services provided by government agencies (e.g. extension services) because they do not want to alienate their vote-ranks. Indeed, most Ceará government officials oppose charging small farmers for the services provided by their agencies.

Fourth, the most successful association examined is an agrarian reform settlement. This is unusual for three reasons: a) most of the literature about agrarian reforms --as well as the common wisdom in Brazil-- stresses that agrarian reforms often fail<sup>2</sup>; b) members of the agrarian reform studied here raise livestock, an enterprise in which they had no previous experience and which is often associated in the literature with large landholdings (CEPA 1986); c) the settlers of the agrarian reform settlement have succeeded in building a program from scratch. This contradicts most of the literature, which suggests that programs should build on what peasants already know (Korten 1980, Rao and Caballero 1990).

The associations in this study have managed to succeed in many tasks despite suffering from some of the same problems that the literature on collective action attributes to failure among these associations. Some of them used to be dominated by the large farmers. All of them have had to solve conflicts with non-collaborative members. Some suffer from management problems and serious financial deficit. All of them have suffered from an adverse environment--high inflation, adverse climatic conditions, and lack of support from local governments. Although these problems are

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<sup>2</sup> Kutcher and Scandizzo (1981) represent a remarkable exception in this literature because they argue strongly for agrarian reform in Northeast Brazil from a neoclassical economics framework. Using a linear programming model based on extensive field research, they conclude that agrarian reform would increase substantially employment and agricultural production, also benefiting consumers through lower prices of agricultural products.

important, I focus on what these three associations did well, trying to explain the conditions and circumstances under which they were successful providing benefits to their poor members--something that the literature rarely focuses on. The questions I ask in the thesis are: Why were small farmers motivated and able to take over the control of their cooperatives if poor members are often considered to be weak and unable to organize? How have small farmers built cooperatives that perform many tasks well, even better than when the elites dominated them? How have they recovered the costs of some of the services they provide? If most of the literature about collective action and the general wisdom in Brazil state that agrarian reform does not work well, why was the agrarian reform case in this study a successful one? How did its members of the agrarian reform settlement successfully raise livestock given that they had no previous experience with livestock? How did this agrarian reform settlement build its success from scratch? My aim is to generate lessons for agricultural policy, program design, and implementation. These lessons should also offer insights into the role that cooperatives and associations can play in poverty alleviation programs.

This study is organized in six parts. In this first chapter, I summarize the purpose and the organization of the study and outline the problem, research questions, and methodology. In Chapter 2, I present a brief overview of Ceará's agricultural sector and describe the three associations studied here. In Chapter 3, I concentrate on unexpected findings in agricultural production carried out by members of the farmer associations. Chapter 4 addresses the issue of extension services provision, comparing

the effectiveness of the extension services carried out by the state government agency on one hand, and by the two of the associations on the other hand. Chapter 5 presents findings on the factors that made it possible for poor peasants to control their associations, either taking them over from the large farmers who dominated them, or mobilizing to claim for the land and developing a powerful organization. In the last chapter I present the conclusions of the study.

## Methodology

This thesis is based on field research in the state of Ceará, Brazil, carried out in the three months between June and September of 1992. During that period, I conducted 112 interviews. In the first month I interviewed officials and field workers in state government agencies in Fortaleza (Ceará's capital city), professors at the Federal University of Ceará, and state-level leaders of cooperatives and of the agrarian reform movement. I spent the following two months interviewing peasant members, and leaders of the three associations (listed below). I also interviewed field workers, especially extension agents from the cooperatives and the government agency delivering extension services. In addition, I interviewed officials of local governments and state agencies in the *municípios*<sup>3</sup> where my three cases were located: Senador Pompeu, Piquet Carneiro, and Monsenhor Tabosa. The interviews followed a flexible

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<sup>3</sup> There are three levels of government in Brazil: federal, state, and *município*. A *município* corresponds roughly to the American county, but differs in that it contains one central township and an outlying and sometimes large rural area. The *município* is governed by an elected "*prefeito*" (mayor) and about a dozen councilmen called "*vereadores*". The total number of *municípios* in Brazil reaches 4,000, distributed among 23 states and three territories. Ceará has 178 *municípios*.

questionnaire with emphasis on open-ended questions. Questions varied with the interview, with the objective being to understand what activities worked better and why. These interviews helped me to select successful cases and to define the political, social, and economic environment of farmer associations in Ceará.

I chose the cases based on the success stories I collected during my first month of interviewing. Defining success was not an easy task. First, it is a relative concept. For example, financial performance represents an important measure of success, but in the adverse climatic and economic conditions of Ceará most of the associations have not shown a good financial performance. Indeed, the fact that small farmer associations were able to survive may be considered in itself an achievement. Second, from a policy perspective some relevant aspects--such as the participation of the small farmers in the associations' leadership and the degree to which the associations target benefits to their poorer members--are difficult to measure through quantitative indicators.

As a result of the problems with financial and other quantitative indicators, I identified the successful cases based on qualitative indicators. Specifically, the successful associations in this study shared the following characteristics:

- a) They were dominated by the poorer farmers rather than by the large ones;
- b) They provided significant benefits to their poor members;
- c) They developed innovative arrangements for internal decision-making and/or for dealing with government agencies that provided them with services;
- d) They performed very well one or more production or organizational tasks;
- e) They implemented organizational arrangements that allowed them to recover part of the costs of some services, even though they highly depended on subsidized credit from the public sector and their financial performance was not always good.

The cases I selected include two cooperatives of individual farmers (the Agricultural Cooperative of Senador Pompeu COSENA, and the Agricultural Cooperative of Piquet Carneiro COAPEC), and one agrarian reform settlement (the Production Cooperative of Santana) in which members collectively own and operate the means of production. The reasons for including the agrarian reform case was that it gave the opportunity to address the implications of different size farms, products, and work organization. At the same time, the three cases were representative of the situations that most small farmers face in Ceará. By comparing the paths they followed, I aim to generate some lessons for agricultural policy and for the design of rural development programs.

## CHAPTER 2

### THE CAST OF CHARACTERS

In this chapter, I describe the three associations included in my study, first situating them within the economic and agricultural policy context of Ceará. Most of the points presented in this chapter are more fully developed in other chapters.

#### The Agricultural Sector of Ceará

With 146,817 square kilometers, Ceará is one of the largest states in terms of area in Northeast Brazil. With a population of six million, it is also one of the poorest. Ceará's per capita Gross Domestic Product (GDP) reached US \$1,182 in 1991, 87% of that of the Northeast and 43% of that of Brazil (IPLANCE 1991 & 1992). The life expectancy of the population is six years less the nation's as a whole (59 compared with a national average of 65). The infant mortality rate of 65 (per 1,000 live births) is higher than Brazil's 57 (World Bank 1992).

Agriculture is still important in Ceará's economic and social structure. 37% of the state's population and 33% of the labor force live in rural areas. Most of this population is extremely poor, with 80% of the labor force earning less than the minimum wage (IBGE 1989). Rural poverty in Ceará stems from three major inter-related problems: recurrent droughts, low agricultural productivity, and a highly unequal distribution of land. Every seven years, droughts affect most of the rural Ceará causing the out-migration of thousands of people to Fortaleza and cities in the more developed south and southeast of Brazil. In part because of the droughts,

agricultural productivity remains low. The Gross Agricultural Product comprises only 14% of the state's GDP (IBGE 1991, IPLANCE 1992). During the drought periods, agricultural production falls dramatically, requiring the federal and state government to intervene regularly with emergency programs to provide food, water, and employment for the rural population.

Low agricultural productivity in the state also reflects Ceará's highly concentrated land distribution. Although 63% of the farms are less than 10 hectares, they have only 6% of the total land area; 39% of the farmers are sharecroppers or squatters who cultivate crops mainly for their own subsistence and live in extremely poor conditions (CEPA 1986, IPLANCE 1992). The sharecroppers grow cotton along with subsistence crops (especially corn and beans) and give the landowner 30 to 50% share of the cotton production. The landowner raises livestock and uses the stubble left in cotton fields to feed the cattle after the harvest.<sup>4</sup> Cotton and livestock, jointly produced in the sharecropping system, have been the most important products in Ceará's economy. These small and poor farmers often lack access to credit and new technologies, and are unable to sell their products at a good price (CEPA 1986). Most of the large farmers in the region are not interested in increasing productivity because they own large areas of land and can make up for low productivity by the low inputs costs (and risks) of raising beef cattle exclusively on natural pastures (CEPA 1986).

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<sup>4</sup> For an excellent ethnographic study of the sharecropping system in Ceará, see Allen Johnson (1971).

## Rural Development Programs and Farmer Associations in Ceará

Widespread rural poverty has led to the implementation of many policies and federal and state programs. Most of these policies and programs have paid special attention to the promotion of farmer associations. While these policies and programs assumed that farmer associations would benefit the small farmers, it was the large farmers who created and benefitted most from the first rural cooperatives in the late 1960s (CEPA 1986). At this time, the federal government started to provide rural cooperatives with subsidized credit and favorable tax treatment. All these co-ops worked around marketing cotton produced by their members. Two more recent programs strongly promoted small farmer associations in Ceará. These are:

- 1) The agrarian reform program, which started in 1987 and was implemented by a federal agency, the National Institute of Colonization and Agrarian Reform (*Instituto Nacional de Colonização e Reforma Agrária*, INCRA). INCRA expropriated large landholdings in Ceará and elsewhere in Brazil and supported the creation of settlements through credit and technical assistance. These settlements have often undertaken collective production, and settlers have formed associations and cooperatives in order to facilitate relationships with banks and other institutions.
- 2) The Program for the Support of Small Farmers (*Programa de Apoio ao Pequeno Produtor*, PAPP).<sup>5</sup> The PAPP program started in 1985 as part of a rural

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<sup>5</sup> The PAPP program was a continuation of another agricultural and rural development program, the Development Program for Integrated Areas of the Northeast (*Programa de Desenvolvimento de Áreas Integradas do Nordeste*, POLONORDESTE), which had started in 1974 and was also co-funded by the World Bank. POLONORDESTE included much the same components of PAPP, but the latter differed significantly in the implementation, providing a more important role to farmer associations. For a review of POLONORDESTE and other rural development programs, see World Bank (1983).



development program co-funded by the federal government and the World Bank. It provided funding for agricultural research and technical assistance, agricultural machinery and processing facilities for small farmer associations, and agricultural credit for working capital. The program used to be coordinated by the State Commission of Agricultural Planning (*Comissão Estadual de Planejamento Agrícola*, CEPA). After CEPA was abolished, the program has been coordinated by a special unit called PAPP in the State of Ceará Secretariat of Planning (*Secretaria de Planejamento do Estado do Ceará*, SEPLAN). The coordinating unit contracted with other state agencies the implementation of the program tasks. After program evaluations stressed that some tasks like agricultural extension and credit were not working well, PAPP began to decentralize the implementation of these tasks in 1987, by funding farmer associations to undertake these tasks instead of government agencies.

Critics of these programs are often quick to point out that most of the funding that they provide to small farmer associations comprise grants and heavily subsidized credit. Thus, the cost of these programs is so high that it would be impossible to extend the programs on a large scale. Second, their impacts on rural organizations are often limited. The associations often become dependent on subsidized funds to survive. After high expenditures on technical assistance, most co-ops' members often continue to apply traditional technologies. These criticisms often suggest that the focus of policy-makers should be on macroeconomic and agricultural policies rather than on these programs.

The three associations that are a focus of this study (and are described below) are all related to the above-mentioned programs.

### Three Farmer Associations

The farmer associations examined here include:

- 1) The Agricultural Cooperative of Senador Pompeu (*Cooperativa Agropecuária de Senador Pompeu* COSENA), located in the *município* of Senador Pompeu,
- 2) The Agricultural Cooperative of Piquet Carneiro (*Cooperativa Agropecuária de Piquet Carneiro* COAPEC), located in the *município* of Piquet Carneiro, and
- 3) The Production Cooperative of Santana (*Cooperativa de Produção do Asestamento Santana*), an agrarian reform settlement located in the *município* of Monsenhor Tabosa.

All three associations share a number of important similarities (see Table 1 for a summary):

- 1) First, they are all located in the semiarid zone of Ceará, between 200 and 250 miles from Fortaleza, Ceará's capital city. All three are located in poor, predominantly rural *municípios* that are dependent on agricultural production (cotton, beans, and corn) (CEPA 1988a & 1988b, IPLANCE 1992). Soils are poor and the drought resistant (xerophilus) vegetation that is predominant in the semiarid has an extremely low productivity for grazing.
- 2) Second, all three associations have received large amounts of state support through grants, subsidized credit, and technical assistance. The PAPP program has provided COSENA and COAPEC with support since 1987 (nine and 17 years after COSENA's and COAPEC's creation respectively). It gave them grants for their

extension services, agricultural machinery, small construction projects in the villages and social promotion, as well as subsidized credit for purchasing processing facilities and to provide agricultural credit for working capital to their members. Meanwhile, Santana has received highly subsidized credit from the Bank of Northeast Brazil (*Banco do Nordeste do Brasil*, BNB) available to all agrarian reform settlements. Credit includes funds from the Program of Special Credit for Agrarian Reform (*Programa de Crédito Especial para a Reforma Agrária*, PROCERA) and from the Constitutional Fund for the Northeast (*Fundo Constitucional de Financiamento do Nordeste*, FNE). The former offered credit for land and purchase of livestock. The latter is a fund set up by the Brazilian Constitution to support the development of the Northeast.

3) Third, poor members run all three associations. In the case of Santana, poor farmers have always predominated because they were the ones who struggled for the land and started the settlement in 1987. But poorer members have not always had control in the cases of COSENA and COAPEC. Large farmers had created and dominated both cooperatives in the 1970s, but leadership of the two co-ops shifted to the smaller farmers in the mid-1980s. The conditions and facts that led to such a change are described in Chapter 5.

There are also a number of key differences between COSENA and COAPEC (which are very similar among themselves) on the one hand, and Santana on the other:

1) The first difference relates to their size and ownership structure. COSENA and COAPEC are much larger in terms of membership and capital investments. They have

Table 1. Summary of main characteristics of the associations.

	COSENA	COAPEC	SANTANA
Location	Semiarid zone	Semiarid zone	Semiarid zone
Year established	1978	1970	1988
Nature of the organization	Cooperative of individual farmers	Cooperative of individual farmers	Agrarian reform settlement
Main cooperative activity	Marketing and processing of cotton	Marketing and processing of cotton	Collective livestock production
Number of active members	600	600	60
Number of communities assisted	24	25	One
Trend of membership	Increasing	Increasing	Stable
Extension services	Own	Own	State government agency
No. of extension agents	3	3	1
No. of farmers per extension agent	400	400	200 (1)
Main funding sources	PAPP (2)	PAPP (2)	Procera (3) PAPP (2) FNE (3)
Investments funded by subsidized state programs	Cotton oil production  2 trucks  3 Tractors	Cotton ginning/ cotton oil production  2 trucks  4 tractors	Dairy facility (cheese production)  1 truck

- (1) The extension agent also assists farmers in nearby villages.  
(2) PAPP = Program for the Support of Small Farmers  
(3) Procera = Program of Special Credit for Agrarian Reform  
(4) FNE = Constitutional Fund for the Northeast

about 600 active members each, most of which are sharecroppers, or small holders owning plots of less than 100 hectares--a small area given the poor soils and low quality of the vegetation in the semiarid region. They own large-scale facilities for

cotton ginning, cotton oil processing, and livestock feed produced from members' crops (cotton, corn, and cassava). Santana has only 60 members, and it only owns a small dairy processing facility to produce cheese during the higher milk production season (January-May). Most of its capital is comprised of 3,100 hectares of land and its improvements that their members own collectively.

2) The second difference relates to the main agricultural products in which they are involved, and the technical dynamism showed by agricultural production. While COSENA and COAPEC concentrate on the marketing of cotton, Santana raises dual-purpose beef and dairy livestock. Cotton is a traditional crop for which cultivated area and production have been declining in all of Ceará since the mid-1980s as a result of a pest (the boll weevil) attacking the traditional perennial varieties. COSENA's and COAPEC's cotton producers have been reluctant --as most cotton producers in Ceará-- to apply new technologies or to cultivate different crops. In contrast, Santana's settlers raise livestock in spite of having been cotton producers before forming the settlement. Although other agrarian reform settlements in Ceará also raise beef cattle, Santana differs in that it produces dual-purpose dairy and beef cattle. In contrast to most livestock producers in the state, who produce based on natural pastures and obtain low productivity (CEPA 1986), Santana has applied new methods of production and increased productivity of the livestock production.

3) The third difference relates to their organization of work. While COSENA's and COAPEC's members produce individually, Santana's settlers produce collectively. Settlers of Santana organize groups that work in different tasks such as fencing,

feeding the cattle, and preparing the land for crops. Instead of specializing in particular tasks, these groups rotate every few months so each settler knows how to do any of the tasks of the settlement and so can substitute freely for each other if needed. Administrative tasks such as accounting, sales, and relationship with banks are the only ones for which there is no rotation. Members also plant one-to-two hectare individual plots with subsistence crops (beans, corn, and cassava).

4) The fourth difference relates to their relationship with state agricultural and rural development programs and agencies. As a result of their involvement in the PAPP program, COSENA and COAPEC had a strong relationship with the State Agricultural Planning Agency (CEPA) and later with the newly created PAPP office in the State of Ceará Secretariat of Planning (SEPLAN). CEPA chose COSENA and COAPEC as the first two cooperatives to participate in the 1987 PAPP decentralization, starting by providing them with funds for the tasks mentioned earlier (agricultural extension and credit for working capital for their members). Santana is strongly related to two other government agencies: the National Institute of Colonization and Agrarian Reform (INCRA), and the Ceará Technical Assistance and Rural Extension Agency (*Empresa de Assistência Técnica e Extensão Rural do Ceará*, EMATERCE). This is because both agencies had an early involvement in the creation of Santana: the former agency expropriated the land and initiated the creation of the settlement, and the latter provided extension services.

5) Another difference relates to the associations' tasks other than agricultural production. All three associations operate foodstuffs stores for members. In addition,

COSENA and COAPEC implement small construction projects (e.g. cassava mills and village stores) using PAPP grants, administer agricultural credit that their members use for working capital, and sell inputs to both members and non-members.

In the next chapter, I present the main findings concerning agricultural production in the three associations. I show the striking success of one of the associations (Santana) in raising livestock, and I explain the most important reasons for such an unusual outcome. I then focus on the contrasting situation of the other two associations (COSENA and COAPEC), in which their extension services have promoted a new technology for cotton inappropriate for most of their members.

## CHAPTER 3

### FARMER ASSOCIATIONS AND AGRICULTURAL PRODUCTION

In this chapter, I turn my attention to decisions taken by the three associations that led to successful tasks. In the first section I focus on Santana--the most successful case in terms of agricultural production--arguing that the reasons for its success relate to decisions settlers made about production, technology, and organization of work. I compare these findings with what the literature often says about such things as agricultural production, technology, and collective action.

Santana's decisions about agricultural production differ from those that COSENA and COAPEC made--resulting in different outcomes. This in spite of the fact that Santana is located in the same region and thus has a similar climate and natural resource base. While settlers in Santana selected a production and technology appropriate to their conditions, COSENA's and COAPEC's extension services concentrated on promoting a declining crop such as cotton, and within that, a technology inappropriate for a large part of their membership. The history of the adoption of this new cotton technology is the focus of the second section.

#### **Raising livestock**

Conventional wisdom in Brazil associates livestock production with large farmers because raising livestock in natural pastures--the traditional technology in Brazil--requires large amounts of land. Brazilian planners also often associate livestock (especially beef production) with the low-productivity holdings found



elsewhere in the Northeast (CEPA 1986, 1987, and 1988). In contrast to these presumptions, Santana has been successful at livestock production. The settlers produce beef and dairy cattle rather than just beef, and they have been incorporating new methods of production. While these decisions do not in themselves explain success, they are the first step to understand how and why Santana worked well.

Santana's livestock production has been quite successful. The settlers have increased the number of animals per hectare from 0.13 when they took over the land to a current figure of 0.22.<sup>6</sup> Although productivity of dairy production remains lower than Ceará's average, it is higher than the average of Monsenhor Tabosa and nearby *municípios* in the semiarid zone. The milk production in Santana reached 24.2 liters per hectare in 1991, as compared to 13.7 liters per hectare in Monsenhor Tabosa, 18.1 liters in Senador Pompeu, and 23.6 liters in Piquet Carneiro. Ceará's average production reached 33 liters per hectare.

Santana's livestock production has worked well for two reasons:

- 1) First, dairy production has provided them with higher and more evenly distributed income than crops alone. Although information for quantifying the difference between current and past income was not available, all the settlers interviewed stressed that they eat more and better than before living in Santana. Their income is also more evenly distributed over the year because it accrues daily instead of during a short period of the year, as with crop production. Dairy livestock also turned out to be less risky than crops because adverse climatic conditions affect milk

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<sup>6</sup> The indicator weights one head of sheep or goats as 0.2 head of cattle.

production less than agricultural crop production. As one settler points out:

If it does not rain during the first month after planting the beans, you can lose the whole crop. But a cow only produces less milk during that period, and after the first rain production becomes normal. It may lose weight, but it is unusual that it dies.

Santana's settlers were to some extent forced to raise livestock; most of Santana's soils were too poor to support crops. But the large area that they had (3,100 hectares) compensated in part for the poor quality of the soils--something the settlers knew by looking at the landowners in the area, who obtained high returns with beef cattle in ranches of similar size. The decision was also in part influenced by the opinion of *técnicos* from INCRA and EMATERCE who participated in the settlers' initial discussions. The role of the extension services is further addressed in subsequent sections. The settlers also like milk production because it provides milk for their children --a product they lacked access during their times as sharecroppers.

2) Second, the settlers have applied a technology appropriate to their conditions. Having a high availability of labor, they have used labor-intensive technology, which is unusual, given that livestock production is known in Brazil for requiring very low quantities of labor. Most of the livestock producers in Ceará are large landowners who raise beef cattle and sheep using the low-productive natural pastures. Under these conditions, raising livestock is a simple process that requires very little labor. While the previous landowner of Santana had only one person in charge of raising the 400 cattle of his landholding, the current total demand for labor reaches 19 man-years, an unusually high quantity for a ranch the size of Santana. The settlers of Santana have applied a technology that requires a great deal of labor--an abundant factor for them:

a) First, the technology used in the set of tasks necessary to feed the livestock--

the most important task in livestock production--demands lots of labor. The settlers use improved pastures and grazing to feed cattle instead of the traditional natural pastures. Most of the varieties of grass used (*capim elefante*, *capim cacho-branco*, *capim cacho-roxo*, *capim braquiana*) are more productive if cut instead of grazed. Consequently, settlers have to harvest the grass-- manually -- and then feed the cattle. After the harvest, the settlers use machines to chop the grass, mixing it with other grains, such as wheat, and melaze, and cottonseed meal, to improve the quality of the feed. This method not only increases the cattle's productivity, but also the use of labor in the chopping and mixing stages. These tasks require about 11 man-years: cultivating and harvesting the grass demands about four man-years, chopping the grass and preparing the feed about four, and moving around the livestock three.

b) Second, the settlers subdivided the ranch into a large number of paddocks to avoid competition between sheep, goats, and cattle. With these subdivisions, the livestock can be moved from one field to another according to the availability of grass in the different pastures. At the same time, cows can be separated from bulls and put together at the most appropriate time of the year for breeding. Substantial demand for labor is generated through subdividing: wood must be cut for fences, and the fences themselves must be built--all requiring about four men-years.

c) The settlers also use irrigation in the improved pastures and grazing. I found this unusual, not only because irrigation is often expensive and difficult to learn, but also because it is often associated with crops rather than livestock. A grant from the Program of Special Credit for Agrarian Reform (*Programa de Crédito Especial para a*

*Reforma Agrária*, PROCERA) provided the settlers with irrigation equipment in 1989. With the help of the EMATERCE's extension agent, the settlers started to learn how to use the equipment. The irrigation system requires about three men-year to operate and maintain the equipment.

d) Settlers have improved the genetic quality of the livestock by buying high quality bulls and rams from outside of Ceará (especially in the neighbor state of Pernambuco), which consequently led to increased milk and beef production. Because higher quality livestock are less resistant to diseases than the native, low-productive animals, they require more frequent and better sanitary treatment, e.g. more frequent vaccinations and baths against parasites. These tasks have also increased the demand for labor to about one man-year.

The experience of Santana shows that raising livestock--especially for dairy production--may be a good alternative for small farmers in Ceará. The state government recognizes this potential, the PAPP program including dairy production in some of the most recent projects (e.g. the new project for COSENA). The lessons that Santana provides relate to the organization of production and the technology of dairy production. PAPP does not deal with the land constraints that small farmers face to raise livestock, giving credit to individual farmers for the purchase of one or a few animals. The evidence from Santana suggests that a successful dairy production among small farmers may require some kind of collective arrangements in land use. The collective use of the land--achieved through agrarian reform or other means--may be an appropriate solution to the relatively high amount of land required to raise

livestock in the semiarid zone. In addition, Santana shows that effective livestock-raising need not be capital intensive: a labor-intensive technology of the livestock production has been appropriate to their conditions, providing employment and increasing productivity.

The question of how the settlers of Santana decided to adopt this elaborate organization of production and technology will be addressed in the following pages. But first I want to contrast Santana's production with the experiences of COSENA and COAPEC.

### A New Technology for Cotton?

In contrast to Santana, members of COSENA and COAPEC have been producing the same crops, and a high proportion of them have not adopted new technology despite the efforts of the cooperatives' extension services to introduce new practices to reduce the impact of the boll weevil. In this section, I argue that only co-op members who are small holders found the new cotton technology attractive. In contrast, the sharecroppers--who comprise most of both co-ops' membership--found the new cotton technology to be inappropriate.

The damage caused to cotton by the boll weevil is illustrated in Table 2. The amount of land in Ceará under cotton cultivation decreased 73%, from an annual average of 1,218,000 hectares between 1975 and 1980 to only 330,000 hectares between 1987 and 1991. Total production in the same periods decreased 69%, from an annual average of 197,000 tons to 62,000 tons (IBGE 1975-1991). Such a decline

affected all of the *municípios* in Ceará. As a result, COSENA's average annual purchases fell 40% from the 1979-1986 period to the 1987-1991 period.<sup>7</sup>

Table 2. Area under cotton cultivation in Ceará from 1975 to 1991.

Year	% ANNUAL COTTON	% PERENNIAL COTTON	TOTAL AREA (hectares)
1975	7.0	93.0	1,123,000
1976	4.6	95.4	1,048,000
1991	32.1	67.9	226,190

\* 1 acre = 0.41 hectares

Source: IBGE. Anuários Estadísticos do Brasil, 1975-1991.

Partially as a result of the decline in cotton production, both COSENA and COAPEC have had unsatisfactory financial returns.<sup>8</sup> The Ceará Agricultural Research Agency (Empresa de Pesquisa Agropecuária do Ceará, EPACE) suggested a new technology based on the replacement of the traditional perennial cotton by a new variety of annual cotton. EMATERCE has been promoting this new technology in all Ceará, and COSENA's and COAPEC's extension services attempted to bring it to their members. But the rate of adoption has been low (see table 2), and with good reason.

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<sup>7</sup> COAPEC does not have data on purchases for before 1985, but its leaders estimate that the decrease in the purchase of cotton reached similar levels to those in COSENA.

<sup>8</sup> Financial problems were not only due to the decline in cotton production. Both coops also suffered delays in receiving funds from PAPP. Because the coops were highly dependent on this funding and the period was characterized by a monthly inflation of about 20%, delays affected significantly their financial results. As a result, the coops frequently were not able to purchase members' production on time, pay the extension agents' salaries, or provide fuel for their field trips.

Most of the cotton in Ceará is cultivated by sharecroppers,<sup>9</sup> and the landlords have been reluctant to let the sharecroppers adopt the annual variety, in part, because it is not compatible with their livestock production. Cotton stubble provides a significant quantity of feed during the dry season, when the production of the natural pastures decreases. This period coincides with the cotton harvest, so the landlord uses the stubble in the perennial cotton fields to feed his cattle. In contrast to perennial cotton, annual cotton fields do not provide feed for the cattle after the harvest. The plants are smaller, leaving less stubble than with perennial plants. Moreover, because the land used to plant annual cotton must be more carefully prepared to avoid weeds and grass, almost no grass remains after the harvest. This resulted in many landlords simply not providing sharecroppers with necessary inputs to cultivate it. Many landlords even prohibit the growing of annual cotton by their sharecroppers.

Not only do the landlords find the annual cotton unattractive, but the sharecroppers also find it expensive, risky, and inconvenient. In contrast to perennial cotton, annual cotton is not drought-resistant, so it requires irrigation to produce high yields. In addition, it demands better soils and more careful soil preparation; the technological package also includes pesticides to control the boll weevil. All these components of the new technology make it very expensive. Evaluations report that

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<sup>9</sup> About 63% of COSENA's members are sharecroppers. Although COAPEC does not collect data with respect to the land tenure of its members, their leaders estimate that the proportion of sharecroppers is similar to COSENA's. The arrangements between landowner and sharecroppers vary significantly. In general, the landowner prepares the land and provides some of the inputs while the sharecropper provides the labor. The sharecropper pays a rent to the landowner of between 30% and 50% of the cotton production, a proportion that depends on the contribution of the landowner to the inputs required by the crop. In addition, sharecroppers usually sell their own cotton production through the landowner. Sometimes this is part of the terms of the relationship, but it is frequently motivated by the sharecropper's need for cash.

irrigation increases the cost of production per hectare of annual cotton by 194%.<sup>10</sup>

The advantage of the annual cotton, however, is that it produces much higher yields than perennial cotton. Reasonable yields in Ceará would be 120 kilograms per hectare for perennial cotton, 800 kilograms per hectare for non-irrigated annual, and 1800 kilograms per hectare for irrigated annual. Without the means to adopt the whole technological package, farmers often choose to adopt the cheaper components of the package, such as the seeds or the pesticides, but not the most costly components, particularly irrigation. Thus, the possibility of obtaining higher yields depends on the rainfall levels during the growing cycle. In a dry year, a farmer cultivating annual cotton may obtain similar yields as with perennial cotton, but incur higher costs. Consequently, this new technology--at least in the way in which it has been most commonly adopted--implies higher risks. Moreover, annual cotton should not be interplanted with subsistence crops, a common practice when cultivating perennial cotton. This makes it even more unattractive for sharecroppers. It is rare that the interests of both landowners and sharecroppers converge. In this instance, however, they coincided exactly in rejecting the annual cotton.

Not all farmers have been against the annual cotton, however. My interviews with members of COSENA and COAPEC show that most small landowners (in all cases less than 100 hectares) saw the new variety as an attractive alternative. One of these farmers said:

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<sup>10</sup> The data comes from unpublished reports of SEPLAN about the technological change of cotton production in Ceará.



The boll weevil was destroying the only source of cash income of my family. If you own a small plot of land, you can't raise livestock and you don't have too many other options. The annual cotton is the best option for me, and the co-op gives me credit for the inputs.

The decline of cotton production has had important economic and social effects in Ceará. Sharecropping itself has become less common in the state because sharecroppers lack any viable alternatives when they cannot grow cotton profitably. Many sharecroppers have been substituting corn and beans for cotton, but others have abandoned the agricultural sector to join the mass of migrants going to Fortaleza and southern Brazil. At the same time, landowners have replaced areas formerly under cotton cultivation with low-productivity livestock.

From the sequence of events presented above, one could ask why both EMATERCE's and the cooperatives' extension services have been promoting annual cotton. The state government agricultural research agency (EPACE) took the technology of the annual cotton crop produced commonly in the south of Brazil, and attempted to adapt the technological package to the conditions of the semiarid Northeast. However, Ceará differs from southern Brazil not just in climate but also in structural characteristics such as land distribution and land tenure. The sharecropping system is typical of the Northeast but uncommon in the South; most cotton producers in the South are landowners. EPACE failed to consider the implications of cotton as the foundation of the Northeast's sharecropping system, and failed to predict the unfavorable attitudes of both sharecroppers and large landowners toward the new technology.

Almost all the extension agents I interviewed (from EMATERCE, COSENA, and COAPEC) were disappointed with the results of the annual cotton. In the words

of an EMATERCE's supervisor, who had worked in the field for fifteen years:

The annual cotton is an invention of the companies selling inputs. If the farmer has access to irrigation it may be convenient, but if he doesn't, the perennial cotton gives higher yields, even with the attacks by the boll weevil. Many of us [EMATERCE's extension agents] are convinced that perennial cotton is still a much better option for small farmers than annual cotton.

In fact, this opinion is common among EMATERCE extension agents. Many extension agents said that they openly encourage small farmers to use the perennial cotton instead of the annual varieties. The insistence by COSENA's and COAPEC's extension services on retaining an inappropriate technology for a declining crop has been one of the main reasons why so little annual cotton was adopted by co-ops' members. This is similar to what has been taking place in the rest of Ceará.

The state government has not yet responded to these problems with any major change in research and extension policies. Upper level officials I interviewed in EMATERCE and SEPLAN recognized that the new technology for cotton was having "mixed results", but I feel that these officials were not yet convinced of its failure. In part, this relates to the quite recent promotion of the new cotton technology in Ceará and lack of any major formal evaluation of how it was adopted, why, and by whom. Political problems not addressed here have isolated EMATERCE, the agency with more field experience, from SEPLAN and other planning agencies in charge of the agricultural policy design. All this has made it even more difficult to address the problem of cotton production.

In summary, this section shows that raising livestock--especially for dairy production--may be a good alternative for small farmers in Ceará. Small farmers have too little land to feed the cattle, so a successful livestock production may require

collective use of the land. This may be obvious for other contexts where raising livestock (though using a less sophisticated technology) is a traditional production among small farmers (e.g. in Africa). In Brazil and Latin America in general, however, peasants cultivate subsistence crops like corn and beans rather than livestock. In addition, Santana's experience with livestock shows that a successful program does not necessarily have to build upon what the beneficiaries already know. A correct selection of the product and the technology are much more important than how easy farmers may learn the new technologies.

This section also shows that the new cotton technology has been inappropriate for most of the farmers in Ceará. This explains the low rate of adoption of annual cotton, the decline in the cultivated area of cotton, and the frequent adoption of some components of the new technology rather than the whole package. It also helps explain the financial problems of COSENA and COAPEC, as well as those of most of the farmer associations in Ceará organized around the marketing of cotton. Interestingly, the evidence shows that small holders found the annual cotton attractive. However, it was the lack of other alternatives for small landowners rather than the intrinsic advantages of the new technology which explains this attraction. Although upper level officials and planners working at the government planning agencies have not ignored the problems of the annual cotton, they have not changed their policies. The evidence shown in this chapter may suggest that government agencies could at least re-formulate some of the policies supporting the new technology, like credit and technical assistance, by targeting those most likely adopters to adopt it--the small

landowners rather than more generally "the small farmers".

## CHAPTER 4

### DEALING WITH THE EXTENSION SERVICES: PRIVATE OR STATE PROVISION?

Recent developments in the public finance literature stress on user charges and privatization of public services as two major policies for expanding the source of revenue of local and national governments and for improving service quality. User charges are intended to recover service costs and ensure a more "efficient" service provision.<sup>11</sup> Privatization of some services provided by the public sector may improve fiscal balances and increase service quality because beneficiaries can participate, and private providers are more efficient and accountable if certain conditions are met (Donahue 1992, Rothenberg 1987, Roth 1988). Some authors stress the important role that non-governmental institutions such as cooperatives, membership organizations, and service organizations already play in providing services in rural areas of developing countries (Uphoff 1986). My interviews in Ceará show that many officials and planners at the State of Ceará's Secretariat of Planning (SEPLAN) share this point of view when thinking about the provision of extension services to farmers. Some of them stress the potential benefits of privatization over the fiscal accounts and the quality of the service. Others think that privatization may strengthen grassroots organizations if small farmer associations become the new

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<sup>11</sup> The efficiency argument calls for setting the price of the service equal to the marginal costs of producing it. The justification is that welfare is maximized when the benefit of an additional unit of the service to the consumer--reflected by his willingness to pay the price--is equal to the cost of producing this additional unit, that is, its marginal costs. See, for example, Bahl and Linn (1992), Cochrane (1983), Davey (1983), and Fisher (1988).

service providers. Both perspectives also point out that EMATERCE, the principal technical assistance provider to Santana, has consistently received poor ratings in evaluation reports of rural development programs in the Northeast. Most of these evaluations have stressed the need for more participation by farmers in the design and evaluation of technical assistance. This explains, in part, why the PAPP program decided to fund cooperatives and associations to provide extension services after funding EMATERCE for many years.

In the first section of this chapter I show that EMATERCE has worked reasonably well in Santana because the settlers negotiated informal working arrangements with the extension agent. These unusual arrangements allowed them to define their demands and to monitor the extensionist's tasks. In the second section I show that COSENA has been able to recover part of the extension service costs by charging its members fees for specific tasks. The evidence shown in the two sections suggests that the dichotomy between public-private service may not be the major policy problem in Ceará, and that recovering part of the service costs may be possible even when most of the "users" are poor farmers.

### **Recipients or Demanders? Farmers Planning and Monitoring the Extension Services**

In spite of numerous recommendations to involve farmers in the design and evaluation of technical assistance,<sup>12</sup> successful examples of participation in the

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<sup>12</sup> World Bank files, including evaluations of rural development programs and of agricultural extension in Brazil.

provision of extension services are rare because both officials and extension agents often oppose it.<sup>13</sup> The good results that Santana obtained in agricultural production, however, reflects precisely the high degree of participation by settlers in planning, monitoring, and evaluating the tasks of EMATERCE extension agent--something different the other cases studied here and quite unusual in Ceará. This situation contradicts the widely-held belief that government agencies always tend to deliver a more top-down style of service while cooperatives or non-governmental organizations incorporate farmers' opinions to a greater degree.

How did farmers participate in the three cases studied here? Both COSENA and COAPEC provide extension services to their members, which do not receive services from EMATERCE. The cooperative manager and the extension agents define the extension tasks themselves without consulting farmers on issues such as the number and order of visits to the different villages. Both co-ops hired young *técnicos* who had little or no previous experience and were usually born in the *município*. Most of the farmers I interviewed stressed that the latter improved their good relationship with the cooperative extension agents as compared with the EMATERCE ones, who may be from anywhere. However, though extension agents discussed many aspects of the service with the farmers in every village, it was the cooperative manager and not the villagers that planned and evaluated the extension agents' work. Thus, the farmers had a quite passive role in the relationship with the co-op extension

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<sup>13</sup> See Tendler (1991) in reference to Northeast Brazil. Also see Moore (1984) for an analysis of this and other problems of a World Bank funded agricultural extension program in India.

agent. The same situation occurs in the case of EMATERCE's technical assistance. The extension agent defines the agenda with his supervisor--having even fewer discussions with farmers than in COSENA and COAPEC--and the supervisor monitors and evaluates his work.

In contrast to COSENA and COAPEC, as well as most farmers visited by EMATERCE in Ceará, Santana's leaders had a relationship with the EMATERCE extension agent that was more like a boss-employee than a farmer-extension agent one. Santana's leaders periodically provided the EMATERCE agent with a list of priority activities that required his advice, e.g. the irrigation of a new improved pasture, the vaccination of cattle, or the attention to some disease in pastures or livestock. Sometimes the extension agent suggested some activity that required urgent attention, but in general he followed the list he was given. This working arrangement is unusual in Ceará, where EMATERCE has repeatedly opposed working under such terms when PAPP proposed them after program evaluations.

Why did the extension agent working in Santana accept these terms if EMATERCE disagreed with this approach? One of the reasons was that the settlers provided him with room and board not only when he visited the agrarian reform settlement, but also when he visited other nearby villages. Santana's leaders and the extension agent developed this arrangement about three years ago, when EMATERCE experienced delays in receiving government funds. Since EMATERCE could not pay the agent's per diem, the group thought of the arrangement in order to avoid long periods between visits. Later, room and board continued to represent an indirect



addition to the agent's income when EMATERCE was able to pay its technical staff's expenses.

In part, Santana's leaders view the situation in political terms. They provide room and board when the extensionist visits nearby villages because the political influence of the group would increase, convincing other farmers that agrarian reform and collective production work well. The settlers were willing to pay the extensionist also because the agent was able to perform tasks that they did not know how to complete. For example, the settlers had begun to irrigate their pastures only a few years earlier, and consequently did not have any experience repairing engines that powered the system. If the engines failed and they could not irrigate, the milk yields would drop in just a few days because the production of grass for feeding the cattle would fall. Because the extension agent had experience with machinery, settlers asked him for help every time they had some relatively simple problem with the irrigation equipment that they could not solve. Although the extension agent knew that repairing machines was not part of his job, he agreed to perform these services because he received food and lodging in exchange.

Most important, the arrangement between the extensionist and the settlers works well because it makes the agent's work easier by giving him a clear picture of what the settlers perceive as problems. In his own words:

It is much better for me to arrive at a farm knowing what I have to do than start to figure out what to do. The latter situation --which is the most frequent one-- is terrible considering that we do not have too much time to spend in a single farm.

As the list that Santana provides includes activities to be done about three weeks hence, the extension agent has enough time to do the necessary research or

background work, such as discussing with other extension agents about a certain problem, or reviewing some of his books to define the possible ways of solving it. From the settlers' point of view, setting a list of tasks represents an effective way to maximize the extension agent's time during his visits to the settlement, and gives them a basis for evaluating the extension agent's work. This arrangement remains completely informal because the EMATERCE extension agent is still evaluated by the normal hierarchical levels and criteria of the extension agency.<sup>14</sup>

This arrangement, however, could only occur because the extension agent and the settlers had developed a relationship based on trust during the early stages of the settlement. The EMATERCE agent had participated with *técnicos* from INCRA in meetings that the settlers had immediately after they settled in Santana's lands, helping them in their discussions about production and organization of their work. The agent not only knew how Santana had evolved, he also felt that his participation had been important in early decision-making, and consequently did not feel that the settlers were "imposing" a way of working on him. In other words, the early involvement gave the agent some control --or a sense of control-- of the decisions concerning production.

In addition, the recruitment of the extension agent in Santana diverged from the usual form, in which EMATERCE assigned extension agents to particular locations without farmer participation in such decisions. Santana's leaders stress the fact that they have to know the person or have information that he is committed to agrarian

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<sup>14</sup> The evaluation criteria used by EMATERCE include traditional indicators that have been criticized (Tendler 1984, Moore 1984) for not representing accurately the effectiveness of technical assistance, such as the number of farmers visited and the total number of visits.

reform. They consider it important to build a relationship based on trust because they feel that an extension agent with a divergent opinion could threaten their existence as a cohesive group. The settlers started setting such criteria because they had problems with another EMATERCE extension agent a few years ago. This agent had reportedly encouraged settlers to work individually rather than collectively, helping to deepen divergent opinions between two opposing groups. This problem resulted in some settlers, who did not agree with continuing with collective production, abandoning the settlement. In contrast, a committed extension agent, who shares the groups' long-term objectives, can facilitate a good relationship within the group of settlers. Settlers find it easier when he works under their conditions and are willing to rely more on his advice.

It is surprising that EMATERCE negotiated with Santana for having a particular extensionist assigned to them--an unusual occurrence for a government extension service. This happened because the success of Santana was well known to the state government and even outside Ceará. This visibility gave Santana more prestige and thus bargaining power with the government. In addition, they were supported in these negotiations by two important agrarian reform groups: the Landless Rural Workers' Movement (Movimento dos Sem Terra, MST) and the newly created Central Cooperative of Agrarian Reform Settlements (*Cooperativa Central dos Assentamentos da Reforma Agrária* CCA). Both organizations received the help of technicians committed to agrarian reform, especially agronomists who helped the settlers in the negotiations with EMATERCE. The negotiations between Santana and

EMATERCE to have a particular extension agent were highly informal. Usually, either Santana's leaders or an agronomist working closely with MST knew of an EMATERCE extension agent in a different municipality who was willing to work in the municipality of Monsenhor Tabosa. Since most agronomists and agricultural technicians in Ceará know each other, they also knew whether he was committed to agrarian reform. Sometimes, the extension agent would ask to be assigned to Monsenhor Tabosa and would be transferred to that municipality. Other times, there was a scissor movement: the EMATERCE extension agent would ask to be deployed to Monsenhor Tabosa and Santana's leaders would ask EMATERCE's supervisors in Fortaleza to have him sent to their *município*.

In summary, the informal working arrangements between Santana and the extension agent are partly responsible for the success of Santana in agricultural production. While the experience of Santana may support the case for groups of farmers hiring their own extensionists, the experience of COSENA and COAPEC--as I show later-- contradicts this. In Santana, these arrangements were possible even though Santana received extension services from a state government agency. Thus, the problems with the agricultural extension in Ceará and elsewhere in the Northeast may be more related to the kind of working arrangements set up with the extension agents than with the dichotomy of public vs. private service provision. In Santana, a simple list of tasks allowed the settlers to define what they considered major problems and to monitor the work of the extension agent. Trust relations based on an early involvement of the extension agent in the period of initiating the settlement and on a

common ideology facilitated the informal arrangements between the settlers and the extensionist. These arrangements also enhanced the agent's job satisfaction, which includes having a friendly relationship with farmers and working in a challenging environment. "Farmers who are demanding and receptive to technical advice at the same time are the model that any extensionist would like to have", the EMATERCE extensionist said.

To conclude, working arrangements like the ones between Santana and the EMATERCE extension agent may have beneficial effects in the quality of the technical assistance, independently of the public or private nature of the service. Two questions concerning the development of Santana's relationship with the extension agent remain to be answered. How did the settlers learn to negotiate and be demanding with public agencies? What special circumstances made these settlers open to technical assistance and training? I will return to these questions in Chapter 5.

### Recovering Service Costs

All the associations studied here regularly faced delays in receiving government funds. With an inflation rate of 20 to 25% monthly, receiving loans and grants one or two months later than expected meant receiving significantly fewer funds.<sup>15</sup>

COSENA and COAPEC, for example, received funding from PAPP to cover the costs of salaries, gas, and maintenance of vehicles for their extension services. When such delays occurred, the cooperatives could not pay the salaries of the extension agents,

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<sup>15</sup> Delays in the transfer of federal counterpart funding to the states characterized the Northeast projects supported by the World Bank during the 1980s (Tendler 1991).

creating a permanent state of dissatisfaction and disappointment among them.

Although the extension agents normally continued to work, the lack of money for gas and spare parts frequently prevented them from going to the fields to visit farmers.

Like the co-ops, EMATERCE frequently received state and federal funds late and could not pay the extension agents' per diem, the amount they are supposed to receive in order to cover expenses for food and lodging in the field. Therefore, Santana also suffered from lack of continuity of the technical assistance.

Planners and project evaluators have often suggested that one strategy for avoiding such funding problems would be to recover the costs of extension services from farmers by charging them for these services.<sup>16</sup> However, leaders of COSENA and COAPEC argue that most of their members do not have the means to pay any fees. Moreover, medium-sized members, who could afford to pay for services, are frequently reluctant to do so when they do not expect to receive immediate benefits. For these reasons, COSENA's and COAPEC's leaders are reluctant to charge farmers for the cost of extension services.<sup>17</sup>

Delays in receiving government funds forced the associations to find new ways to support their programs. One strategy was described in the last section, and consisted of Santana providing room and board to the EMATERCE extension agent when the agency was unable to pay his per diem. The second example involves

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<sup>16</sup> This view is based on an extensive literature in the field of public finance that argues for the cost recovery of services through user charges. For example, see Bahl and Linn (1992), Cochrane (1983), Davey (1983), and Fisher (1988).

<sup>17</sup> Most of the officials from EMATERCE and PAPP that I interviewed also disagreed with the idea of charging for extension services due to the extreme poverty of the beneficiaries of the PAPP program.

COSENA partially recovering the costs of technical assistance by charging fees for certain specialized services. COSENA charges a fee equal to the cost of gas to any farmer requesting a visit by the extension agents for veterinary services. Although this fee was low and it represented a low proportion of the total cost of the service, the cooperative was able to use the money thus collected to purchase fuel for the agents' vehicles in difficult financial periods. This allowed the agents to visit small farmers the same day that they visited the larger one requiring veterinary services, and it reduced the periods in which the co-op extension agents were not able to go to the field due to the lack of gas. While most of the cooperative members have one or two cows to meet their subsistence needs, those requiring veterinary services usually specialize in beef and dairy livestock production and have larger herds. Because they were among the better-off members, co-op managers thought that they would be more able to pay for services.

The decision to charge for veterinary services turned out to work well not only because the affected farmers were better able to pay, but also because farmers expected to have high losses if they did not receive the services. Veterinary services usually involve emergency care, such as cesarean sections for cows or other kinds of surgery, without which the farmer may lose the animal. This potential for loss provides a strong incentive for farmers to take an interest in technical assistance and to assume some costs. Moreover, farmers who received veterinary services see an immediate benefit, in the shape of a recovering animal. In contrast, the higher yields promised if farmers follow extension agents' advice concerning their crops do not

materialize until several months later, if at all. In Santana, the settlers paid the extension agent because he repaired irrigation machinery --a task not included in EMATERCE's normal service. As in the veterinary services case, the magnitude of the potential losses, coupled with the high cost and scarcity of engine mechanics in the region, motivated Santana's settlers to share costs of the extension services.

In summary, both farmer associations and EMATERCE were able to recover part of the costs of the extension services. The experience of COSENA shows that charging for veterinary services allowed the co-op to recover part of the extension services' costs without affecting the poorer members. The fees turned out to be distributionally desirable, involving an implicit "cross subsidy" effect to the smaller farmers from farmers doing livestock, who usually have more land and are the better-off. The evidence from Santana also shows that EMATERCE might actually be able to recover some of its service-costs, contrary to its current claim, by making agreements with farmer associations such as those discussed in the last section. For example, the agency could provide basic services for free but charge for additional services not included in the basic fare, such as equipment maintenance. Because farmers and associations find it easier to pay in kind than in cash, the fee for additional services could include food and lodging. The extension agent could receive additional compensation for the additional services he provides, and this would encourage him to receive further training.

In the next chapter, I focus on the factors that explain why members of the three associations joined to form them or to take over control of them.



## CHAPTER 5

### ORGANIZING FOR EFFECTIVE COLLECTIVE ACTION

In this chapter, I draw on the history of the three associations to explain what made it possible for poor members to dominate all of them. This is not only relevant by itself, but also because it helps explain why they were able to do what they did well.

#### Sharecroppers Undertaking Collective Production

Most of the literature about collective property resources focuses on their problems rather than their successes.<sup>18</sup> Such perspectives also characterize most of the literature on agrarian reform, which stresses that these reforms often fail.<sup>19</sup> This section focuses on the history of Santana and aims to identify the conditions that resulted in its success. I argue that although the working of Santana as a collective entity is impressive, it shares the historical roots and many of the achievements of other groups in Ceará and other parts of Brazil. What makes Santana different--and probably not replicable--is the presence of many unusual people, including motivated and dedicated leadership. The self-selection of the group members and the option to exit the group explain in part these features of Santana.

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<sup>18</sup> For a different perspective, see Ostrom (1990), Ostrom et al (1990), and Wade (1986).

<sup>19</sup> See for example De Janvry (1981) and Grindle (1986). For an argument for agrarian reform in developing countries see Adelman (1979), and for Northeast Brazil see Kutcher and Scandizzo (1981). For a more critical review of agrarian reform cases in different Latin American countries, see Thiesenhusen (1989).

As elsewhere in Brazil, the settlers of Santana have a long history of cooperation, bound together by their work with the Catholic Church. In the early 1960s, local priests began to promote grassroots groups, the "Christian Base Communities" (*Comunidades Eclesiais de Base* CEBs) in Monsenhor Tabosa.<sup>20</sup> The parents of the current settlers of Santana worked part of their time collectively on lands owned by the Church. Priests introduced these collective work programs called *mutirão*, which consisted of the exchange of workdays by small groups of peasants, usually about five persons per group. Group members would work together, for example, planting corn and beans on the plot belonging to one of their members for one week. The following week, they would work on the plot belonging to a different member. As in other parts of Ceará, peasants liked the *mutirão*. It made some tasks easier that were too difficult for one person to do, such as plowing or cleaning the land.

Many rural communities in Brazil share a similar history as the settlers of Santana, emerging from the work of the CEBs. After the new democratic government approved the agrarian reform law in 1986, Santana, and many other groups of landless peasants like Santana in the Northeast and the rest of Brazil, were successful in their

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<sup>20</sup> The Church promoted the creation of some 80,000 CEBs throughout Brazil, each one including 50 to 100 people. The CEBs first began as discussion groups in Northeast Brazil at the beginning of the 1960s. Having an enormous receptivity among the rural poor, the Brazilian episcopal hierarchy supported them officially since the mid-1960s. The CEBs spread out all over Brazil at the end of the 1960s and often evolved into more active roles, such as undertaking "land occupations" to claim for land. Many authors stress the crucial role of the CEBs in raising the consciousness of the rural poor in Brazil and their motivation to enter into social movements. See Della Cava (1989) and Mainwaring (1986) for an analysis of the role of the Catholic Church and the CEBs in the Brazilian transition to democracy between 1974-1985.

demands for land. In that sense, Santana is not a unique case. What makes Santana different from other non-successful cases is that it has an unusual number of qualified leaders and members with outstanding characteristics.<sup>21</sup> Unlike many other groups, in which one or two leaders "run the show", Santana has at least ten leaders who not only use their natural abilities for public speaking during the group meetings, but also supervise work teams, are in charge of the marketing of Santana's products, and of negotiating with the EMATERCE extensionist and with public agencies. These leaders speak about the history of the group with pride, but they speak more about the present and future of Santana. They argue with great conviction about the advantages of the collective use of the land--in strikingly "capitalist" terms. One of the leaders said: "We think our cooperative as a private enterprise. We are here to make profits because it is the only way we can improve the living conditions of our people." This particular view of the world (which blends the belief in socialism with an entrepreneurial "pragmatism") is typical of Santana's members, and it cannot be explained by the effects of a particular program or project.

In part, the exceptional characteristics of the settlers relates to a self-selection of the participants--something unusual in the experience of agrarian reform. While agrarian reform programs often benefits first the workers who previously lived or worked for the land, the settlers worked as sharecroppers in lands nearby rather than in the lands that currently comprise Santana. In these lands, only a few sharecroppers

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<sup>21</sup> Burdick (1991) argues that the success of a particular CEB had more to do with the characteristics of its members and their understandings of the CEB purpose and message. In a case study of one CEB, he found that illiterate people with heavy and inflexible labor schedules, blacks, and married women facing domestic conflict found the CEB less useful and thus participated less.

lived and only two of them finally join the group. In 1986, the representative of the Union of Rural Workers (*Sindicato dos Trabalhadores Rurais*) in Monsenhor Tabosa spread the word that the owner of the lands comprising present-day Santana did not have legal titles for the land--something that they soon confirmed. The settlers, who were already organized, presented their claim at the INCRA in 1986 and occupied the land. Only those willing to confront the risks of the struggle participated. All were young people (most of the settlers are now between 25 and 35 years old)--in contrast to most agrarian reform settlements in Ceará, in which settlers are of different ages. All of them had participated in christian youth groups in addition to working in *mutirão*. Local priests also promoted these groups, which discussed daily problems and promoted collective solutions. Their discussions involved, for example, the lack of land they suffered, the high rents they had to pay, and the possible solutions to the high prices of the local foodstuff store.

The youth groups represented an opportunity for young people to develop relations based on solidarity--values that the priests emphasized. They also learned how to jointly discuss problems, propose solutions, and undertake concrete and successful actions. For example, in the early 1980s, these meetings resulted in the creation of a foodstuffs store that they managed collectively. A group started it in response to the high prices charged by the only local consumer store, owned by the landowner.

The settlers also created the option to exit the group without losing all of the work done by the departing members. Once they decided to own the land and

produce collectively, many of the people who wanted to produce individually left the group. At that point, the settlers established the rule that allows members who do not want to work collectively to quit the settlement, receiving their share of the profit generated while they lived at Santana.

In summary, self-selection and the option to exit helped a group of young exceptional people with a long, commonly-held experience in collective action come together in a particular moment--after the federal government approved the agrarian reform program. While this explanation may not be new, it is essential to explain why Santana was successful in achieving the things explained in previous sections. The experience of Santana as a whole may be unique, and none of its components may by themselves explain Santana's success on its own, but lessons can be drawn from what Santana did (e.g. the dairy production unusual in agrarian reform settlements), and how it did it (applying new labor-intensive technologies and collectively using the land). These components were the focus of previous sections.

### **Small Farmers Taking Over COSENA and COAPEC**

Until the middle 1980s, a group of middle-sized and large farmers dominated both COSENA's and COAPEC's decision-making. Some of the most powerful members of the local elites were part of both groups. These large farmers had created both cooperatives in the 1970s in order to take advantage of subsidized credit from the Bank of Brazil for cooperatives based in ginning and marketing of cotton--a crop that planners of POLONORDESTE (and also CEPA in Ceará) perceived as the most

important for the development of the Northeast. Through the cooperatives, the large farmers wanted to obtain economies of scale in the marketing and processing of cotton.<sup>22</sup> Because the small farmers produced a significant fraction of the region's cotton crop, the large farmers needed their participation in the new cooperatives. At the same time, small farmers had few options other than joining the newly created co-ops. In any case, most of them were sharecroppers and their landlords forced them to join in. But, small landowners also perceived that the cooperatives could give them a better price for their cotton. Thus, small farmers soon dominated membership of both COSENA and COAPEC, even though the leadership remained in the hands of the large farmers. These large farmers controlled the main bodies of the co-ops: a Board of Directors elected by the active members every four years, an Assembly, and a Fiscal Board. This was normal in all the 35 rural cooperatives in Ceará. How were the poor members of COSENA and COAPEC able to take over their cooperatives?

I argue that the change in leadership in COSENA and COAPEC relates to the combination of two factors. First, an education component of a state program which succeeded in promoting the participation of the poorer members of the co-ops. Second, the contradictory effects of the new cotton technology over the motivation of small and large farmers to participate in the co-ops.

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<sup>22</sup> The processing of agricultural products that require heavy equipment promotes the collaboration between small and large farmers because fixed costs can be shared among more farmers and equipment can be used at full capacity (Attwood 1987, Attwood and Baviskar 1987).

## A Successful Educational Program

The changeover in leadership from large to small farmers only took place in the middle 1980s. During that period, the poorer members of COSENA and COAPEC became increasingly involved in the cooperatives' decision-making. One of the reasons why this happened was the success of an educational component of the POLONORDESTE program, which raised small farmers' consciousness about the benefits of participating in assemblies and meetings. This is unusual because even though many programs attempt to increase farmers participation, they often fail because they face elite opposition (Tendler 1982 & 1991).

POLONORDESTE's educational component was successful in part because it did not face--at least at the beginning--elite opposition. Just the opposite. CEPA (the implementing agency of POLONORDESTE) designed the program in such a way that the leadership of COSENA and COAPEC received strong pressures from their own upper level organizations to implement it. In fact, CEPA contracted the implementation of the program with the Ceará Organization of Cooperatives (*Organização das Cooperativas do Estado do Ceará*, OCEC), the state level organization of cooperatives dominated by the large farmers. Such a program design was possible because CEPA was integrated by leftist *técnicos* and managers who were committed to social change in the rural areas. Some of these managers had a long experience working with rural programs in Ceará and knew that the program would fail if elites opposed it. CEPA offered OCEC funds to implement the program throughout the state, but put the condition that CEPA would participate actively in the

hiring of staff. OCEC engaged in the program because its leaders thought that it would provide their organization with substantial funding. They did not think that the program would harm their position. One of these leaders, who later became President of OCEC pointed out: "We never thought that the educational activities would cause so many problems." CEPA has succeeded in creating pressures from above over the cooperatives' leadership to implement the educational activities.

At the same time that the program created pressure from above to implement the educational activities, it promoted the mobilization of grassroots groups created by the Catholic Church in earlier years of its work. Local priests had been working with community groups in Senador Pompeu and Piquet Carneiro. These groups were part of a successful major effort of the Catholic Church to mobilize the poor in all of rural Brazil.<sup>23</sup> In order to contact these grassroots groups, CEPA managers hired a group of 20 committed and motivated staff members to work on the educational tasks of the program. Most of these staff members thought that the support of CEPA could bring an opportunity to promote change in a very concrete and achievable way through the mobilization of the poorer members of Ceará's cooperatives. A former Director of CEPA pointed out:

The staff we hired comprised people we knew and trusted. Some of them came from vocational schools, but most of them had gained their experience working for Catholic Church groups. This made it easier to work with local people, to gain the trust of the communities and to work with existing grassroots groups of small farmers.

For example, in Senador Pompeu the program staff worked hand in hand with an

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<sup>23</sup> See Della Cava (1989) for an analysis of the role of the Catholic Church in the mobilization of the rural poor in Brazil during the 1970s and 1980s.



active Italian priest who had been expelled from the neighboring state of Bahía by the Church authorities for doing grassroots work. This priest facilitated the access of the program staff to the rural communities.

The educational component of POLONORDESTE began in 1982 and included training courses and conferences for small farmers in all of Ceará on issues related to cooperatives. The training courses discussed basic issues concerning cooperatives: how a cooperative works; what are the characteristics of a good co-op administration, a good co-op manager and a good co-op President. As a small farmer who is now a member of the COAPEC leadership said:

We started to realize that our leaders did not fit any of these characteristics. They decided everything by themselves and we were not supposed to have any doubt about their honesty or capacity.

Small farmers also learned that they have important rights as co-op members, rights that they were not fully exercising. Another small farmer of COSENA commented:

We used to wait for hours to see the manager for any problem we had. His attitude was that of a ruler and ours of beggars. We know now that we have the right to talk to the manager at any time, and that he is an employee of our co-op who has the obligation to help members.

The educational program turned out to be so successful in creating strong pressures from below over entrenched leadership that most of these leadership began to complain to OCEC. Threatened by the effects of increased participation, these leaders wanted to terminate the agreement that OCEC had with CEPA. Because the President of OCEC still supported the training activities, they elected a more conservative President who opposed the courses in the next election in 1987. In the words of the new elected President: "The educational activities were causing problems among the membership, promoting the mobilization of a few radicals who questioned

the elected leadership." Under his leadership, OCEC rapidly retired from the implementation of training courses, terminating the agreement with CEPA.

The mobilization of small farmers achieved its most impressive results in COSENA and COAPEC. The educational programs helped to encourage the formation of groups of small farmers in every village who were interested in participating more in the local decision-making. Following OCEC's withdrawal, CEPA did not have another implementing agency that could fulfill the same training function as OCEC. However, officials and technical staff from CEPA saw that it was highly probable that the small farmers would take over the leadership of COSENA and COAPEC in the next elections of the cooperatives' authorities. They decided to hire the social workers who had worked for OCEC in Senador Pompeu and Piquet Carneiro and to continue the mobilization of small farmers in COSENA and COAPEC. This decision contributed to the final takeover, which took place in 1985 in COSENA and in 1986 in COAPEC, and led to the establishment of a more participative decision-making process with input from the village groups. In COSENA, the change in leadership occurred in the co-op election of 1986. While there used to be only one candidate for President and for members of the Board of Directors, the intense work of the social workers encouraged a group of small landowners to present another list. The eventual winners were elected from this list. The control of these two cooperatives by the small farmers became the basis for CEPA choosing them in 1986 as the first farmer associations to take over the newly decentralized tasks such as credit administration and extension services.

In summary, the educational component of POLONORDESTE succeeded because it was able to create simultaneous pressures "from above" and "from below" over the COSENA's and COAPEC's leadership.<sup>24</sup>

### Who Needs the Co-ops?

In both COSENA and COAPEC, the entrenched leadership did not struggle strongly enough to maintain their control. My conversations with both large and small farmers suggest that the spectacular spread of the boll weevil in the cotton crop affected large farmers, small landowners, and sharecroppers differently. While most of the larger farmers lost interest in the co-ops by the mid 1980s following the spectacular spread of the boll weevil in the cotton crop, small landowners became more interested and comprised the main portion of those who mobilized against the previous leadership. This relates to the characteristics of the new cotton technology promoted by the state government agencies (EPACE and EMATERCE), which the small holders rather than the large ones found attractive. This is unusual because an extensive literature argue that new technologies often benefit the large farmers, increasing inequality of income and asset distribution.<sup>25</sup>

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<sup>24</sup> Analyzing a rural food distribution program in Mexico that worked under a similar dynamics, Fox (1992) called this phenomenon "sandwich strategy".

<sup>25</sup> See, for example, Griffin (1974) and Pearse (1980). Other authors provide evidence contradicting this assertion. See, for example, Gosch (1972), Hazel and Ramasamy (1991) and Lipton (1989).

As noted in Chapter 2, cotton production fell as a result of the boll weevil,<sup>26</sup> and all the cooperatives in Ceará faced serious financial problems. The Ceará Agricultural Research Agency (*Empresa de Pesquisa Agropecuária do Ceará, EPACE*) began promoting the use of a new technology based on an annual variety of cotton. The new technology was capital-intensive, requiring the use of new seeds, pesticides, and irrigation. Therefore, the larger farmers were apparently better positioned than small farmers to adopt the new technology. However, most large farmers were reluctant to adopt the annual cotton because it was less compatible, as I explained in a previous chapter, with livestock production--their most important activity. The lack of compatibility of the annual variety of cotton and the landowners' livestock production also explains why most of them did not let their sharecroppers adopt the annual cotton, though the high capital requirements already made it unlikely that the sharecroppers could cultivate it on their own.

The pest affected both large and small farmers, but the large farmers had the option of switching to livestock, as they had never abandoned it and it was still their central product. Not producing cotton, the cooperatives became less useful to these large farmers so they lost part of their interest in them. In contrast, the group of small landowners became more interested in controlling the cooperatives. Without the land required to raise livestock instead of cotton, small farmers had no other production alternatives and, consequently, were very interested in adopting the new cotton

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<sup>26</sup> See section discussing new technologies for cotton production in chapter 3 for a complete analysis of the effects of the boll weevil and of the suitability of perennial and annual cotton for small and large farmers. Also see table 2.

technology being promoted by EPACE and EMATERCE. They needed to participate more in order to have access to the new technology being promoted by the government extension services. Control of cooperative decision-making would give small farmers access to the credit and inputs they needed to implement this new technology.

## CHAPTER 6

### CONCLUSIONS

This thesis has focused on the lessons for program design and implementation provided by the experience of three small farmer associations in the state of Ceará, Brazil. The evidence shows that some facts common in the literature, as well as in the conventional wisdom among Brazilian planners, may not always be true.

The experience of Santana, the agrarian reform case, shows that a group of landless peasants were able to succeed in raising livestock--a product they had no previous experience with--and to learn a whole set of new technologies. This suggests that a successful program does not necessarily have to be built upon what the beneficiaries already know, in contrast to what most of the literature points out. Rather than being concerned with the past experience of the beneficiaries, the successful programs selected an activity and a technology appropriate to the environmental and social conditions of these beneficiaries.

This study shows that COSENA and COAPEC directed high expenditures from a federal program (PAPP) to promote a new technology for cotton (a traditional cash crop among small farmers) inappropriate for most of their members. While the new technology based on annual cotton may prevent the attack of the cotton disease (the boll weevil) and increase yields, both landlords and sharecroppers (the most important agents in Ceará's cotton production) coincide in their negative perception of the new technology. Because annual cotton provides no feed after the harvest, landlords find the new technology inappropriate to their livestock production. Sharecroppers not only

find it expensive, but also they face the opposition of their landlords to adopt the new technology. Interestingly enough, small landowners were the only ones who found the annual cotton attractive, but it was more because they lacked other alternatives rather than for the advantages of the technology on itself.

The effects of the boll weevil and the new cotton technology explain, at least in part, the change in leadership in COSENA and COAPEC. The evidence in this thesis shows that the large farmers who dominated both cooperatives lost a great deal of their interest in them as a result of the decline in cotton production due to the attack of the boll weevil. At the same time, the small landowners--attracted by the annual cotton--became active participants in the takeover of COSENA and COAPEC from entrenched leadership. They needed to control the cooperatives more than ever to get access to the inputs, technical assistance, and credit required by the annual cotton. The decline of the cotton production also affects the sharecropping system that has traditionally dominated in Northeast Brazil. While this is an ongoing process and its results difficult to predict, it represents a remarkable area for further research.

It seems striking that an inappropriate technology for most of the producers (the annual cotton) has been created and strongly promoted by state agencies. Because the state research and extension agencies (EPACE and EMATERCE) started the massive promotion of the annual cotton relatively recently, the state planning agency (SEPLAN) has not yet conducted any formal evaluation. Although many EMATERCE extension agents and supervisors think that the new cotton technology is inappropriate, political problems that have isolated EMATERCE from SEPLAN have

simultaneously contributed to the lack of information of higher level officials in the planning agency about these problems. All this does not necessarily imply that the annual cotton is totally inappropriate for Ceará's conditions, but it suggests the importance for the state agencies to know the most likely adopters of the new technology--the small landowners--in order to better target credit and technical assistance.

Santana's success raising dual-purpose beef and dairy livestock contradicts most programs targeting small farmers elsewhere, which focus primarily on crops rather than on livestock. This is not new in Ceará, where the PAPP program has been recently incorporating dairy production into some projects in the semiarid zone for small farmer associations based on its perceived potential benefits to small farmers. Labor-intensive livestock is also a traditional production among small farmers in other regions (e.g. in Africa). But it is uncommon in Brazil and Latin America in general, where peasants produce subsistence crops rather than livestock. Most importantly, the success of Santana raising livestock would have been impossible without the collective use of the land. Individual farmers would have failed because every farmer would have had too little land to feed his cattle. This suggests that raising livestock may be appropriate among small farmers even in conditions of semiarid climate and poor soils, provided they can work out collective arrangements for the use of the land.

The evidence from Santana shows that job satisfaction on the part of the extension agent and farmer participation in planning and monitoring the extension services dramatically improved the performance of the extension services. This is



important because successful cases of farmer participation in planning technical assistance are uncommon. In this case, a list of tasks that the farmers elaborated in advance not only allowed them to define what they considered important technical problems, but also to maximize the time that the extension agent spent in Santana. This system allowed the extension agent to do the necessary background work for the tasks and arrive at the fields knowing exactly what to do. Such arrangements contributed to the extension agent's job satisfaction because he found that the settlers were demanding and open to their advice. Most striking is that Santana worked out these arrangements with an extension agent from EMATERCE, a state agency that has received poor grades in evaluation reports and has been repeatedly opposing to work under similar conditions. In part, this suggests that government extension services do not have to be top-down to be effective, and that the solution to problems of the extension services do not necessarily lie in privatizing the service. In fact, the problems with the agricultural extension in Ceará and elsewhere in the Northeast may be more related to the kind of working arrangements set up with the extension agents than with the dichotomy of public vs. private provision.

The experiences of the associations also show that even though most of their members are poor farmers without means to pay, they can find alternative ways of recovering part of the costs of the extension services. COSENA, for example, charged for gas when its extension agents provided veterinary services. Although the farmers using veterinary services owned cattle and were the better-off of the cooperative, they did not oppose to the fees because potential losses of not having the service (for

example, loosing a cow) were high. While the fees covered a small proportion of the total service costs, they allowed the extension agents to purchase gas and visit small farmers in periods of delay receiving government funds. The fees were also distributionally desirable, as they cross-subsidized the service provided to the small farmers.

A successful educational component of a state program has been able to avoid the opposition of local elites by using as implementing agencies a state level organization, OCEC, dominated by the large farmers. At the same time, the program hired committed staff who mobilized existing grassroots groups at the local level. While the participation of OCEC created strong pressures from above to implement the educational tasks, the increased participation of their poor members focused pressure from below. This turned out to be one the major reasons explaining how small farmers in COSENA and COAPEC were able to take over coop leadership.

Introducing organizational skills among small farmers and promoting their capacity to act collectively can have an enduring effect. The experience of the associations in this study shows that government programs should look to building upon active or nascent groups that already exist given the action of the Catholic Church or other Non-Governmental Organizations, rather than merely relying on creating new groups. When there is self-selection and the option of exit exists, these groups may contain the best of the people.

To conclude, this thesis has provided lessons which often emerge not by the success of a particular government program or project, but from tasks that the three

associations did well precisely outside the programs--or even against formal program arrangements. The success stories often come from solutions that the associations created, for example, to confront delays from government funding, to avoid formal arrangements perceived as ineffective, or to comply with ideological and political objectives of their membership. It is looking at these unexpected solutions that government programs often considered as a failure may be improved to benefit the rural poor and promote rural development.

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