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April 2002

Challenging Conventional  
Wisdom:  
Smallholder Perceptions and  
Experience of Land Access  
and Tenure Security in the  
Cotton Belt of Northern  
Mozambique

Paul J. Strasberg and Scott Kloeck-Jenson



Land Tenure Center

AN INSTITUTE FOR  
RESEARCH AND EDUCATION  
ON SOCIAL STRUCTURE,  
RURAL INSTITUTIONS,  
RESOURCE USE,  
AND DEVELOPMENT

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UNIVERSITY OF WISCONSIN —  
MADISON

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**CHALLENGING CONVENTIONAL WISDOM:  
SMALLHOLDER PERCEPTIONS AND  
EXPERIENCE OF LAND ACCESS AND  
TENURE SECURITY IN THE COTTON BELT  
OF NORTHERN MOZAMBIQUE**

by

**Paul J. Strasberg and Scott Kloeck-Jenson**

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*I dedicate this paper to our departed friends, Scott, Barbara, Zoe and Noah Kloeck-Jenson.*

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## Acronyms

ADB	African Development Bank
CARE-OPEN	Oilseed Press Enterprises in Nampula
EEAN	Empresa Estatal de Algodao de Nampula
GOM	Government of Mozambique
JVC	Joint Venture Company
LOMACO	Lonrho Mozambique Agro-Industrial Company
LTC	Land Tenure Center
MAP	Ministerio de Agricultura e Pesca (Ministry of Agriculture and Fisheries)
MAP/MSU FSP	MAP/Michigan State University Food Security Project
NET	Nucleo de Estudo de Terras e Desenvolvimento
NGO	Non-governmental Organization
ORAM	Organizacao Rural de Ajuda Mutua
PVO	Private Voluntary Organization
PUPI	Pequena Unidade de Producao Intensiva
SAMO	Sociedade Algodoeira de Monapo
SODAN	Sociedade de Desenvolvimento de Algodao de Namialo
UEM	Universidade Eduardo Mondlane
UNAC	Uniao Nacional de Associacoes Camponesas
USAID	United States Agency for International Development

## FOREWORD

Results reported on in this draft document derive from data collected by the Land Tenure Center (LTC), University of Wisconsin–Madison, in collaboration with the Ministry of Agriculture and Fisheries/Michigan State University Food Security Project in Cabo Delgado and Nampula Provinces from June 1994 to February 1996. Funding for this report was provided to LTC by the United States Agency for International Development/Mozambique. The LTC project was based at Eduardo Mondlane University and worked with a variety of institutions in civil society and the government sector. The LTC project collaborated with USAID in promoting increases in rural household income and agricultural productivity through improving smallholder land tenure security in Mozambique.

While the authors accept all responsibility for errors of fact, interpretation and omission, we would like to thank the following institutions and individuals for providing useful insights and support:

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## EXECUTIVE SUMMARY

The Council of Ministers of Mozambique recently approved regulations to accompany the new land law that went into effect in January 1998. The impetus behind these actions was the belief that a new legal and regulatory framework was necessary to reduce the frequency of land conflicts between largeholders and smallholders while simultaneously promoting much-needed investment in the agricultural sector. Based on media reports from across the country, it appeared that conflicts over land had been increasing in both frequency and intensity as smallholders, forced to flee during the war, began to return home and reoccupy their land area.

Under the former legal framework, millions of hectares of land concessions had been provisionally granted with apparently little or no consultation with local communities to determine the extent to which smallholders were already occupying the land being requested. The new legal framework mandates that local community consultation be a component of any new or pending request for land proffered by outside investors to government. Perhaps more importantly, the new land law requires all requests for land which had been provisionally granted be treated the same as new requests. Specifically, this requires local community consultation be an integral part of these processes. In all probability this provision will help communities, where land requests are “in the pipeline,” play a meaningful role in determining ownership and use rights of these areas.

Government policy with respect to granting land concessions (largely from now defunct state farms) has focused on allocating these prime areas to Mozambican and international large-scale agribusiness interests. Implicitly assumed is that land access in the smallholder sector, allocated through customary tenure systems, is abundant. With empirical evidence presented in this report, based on smallholder survey data collected from 1994 to 1996 we challenge this and two related widely held beliefs about land tenure and access in the smallholder sector in Mozambique.

The report suggests that, although the new land law may improve tenure security for smallholders who experience conflicts with largeholders, two key areas of policy concern have been neglected. First, while provisions in the new legal framework to safeguard local community land-use rights vis-à-vis outsiders are important, they will not be sufficient to eliminate and/or adjudicate land conflicts between smallholders themselves. Second, while much attention has been devoted to the legal and regulatory component of land tenure in Mozambique, research results reveal significant variation in the size of household landholdings even when controlling for household size. Further, land access was found to be closely linked to key welfare indicators such as income and calorie availability; a weak nonfarm economy heightens the importance of land for the welfare of rural families. These results are surprising and contradict views held by many in the policy community in Mozambique that land access is unconstrained for smallholders.



## Methodology

Using case study methodology, the LTC Mozambique Project has documented a number of smallholder conflicts on land formerly held by the state since 1991. To analyze these issues in a statistically rigorous fashion and determine whether these tenure-related conflicts were confined to the areas of case study or were more widespread, LTC collaborated with the Ministry of Agriculture and Fisheries/Michigan State University Food Security Project (FSP) to implement a household survey in six districts within Mozambique's northern Cotton Belt. Prior to the LTC survey in January-February 1996, FSP had visited the same sample of 521 households at regular 4-month intervals between 1994 and 1996 to assess the impact of their participation in cotton production schemes organized around Joint Venture Companies (JVCs).

## JVCs and land use in the Cotton Belt

Acknowledging the failure of the state farm sector in the Cotton Belt in the late 1980s, the Mozambican government invited Portuguese and British firms to form JVCs with government to revive cotton production systems in selected areas of influence in Nampula and Cabo Delgado provinces. Three JVCs were formed, each enjoying the exclusive right to purchase cotton from smallholders within its area of influence. Promoting cotton through the JVC model was designed both to increase smallholder cash income as well as to improve food production by enhancing the availability of agricultural inputs and extension services. The JVCs were to inject capital to rehabilitate ginning facilities, build rural roads, and provide other infrastructure for the postwar reconstruction.

JVC cotton-related activities in the north have generated substantial debate on a number of issues, including the implications for smallholder access to land and food security. Some have suggested that land conflicts and smallholder concerns about tenure security are a significant problem in JVC areas and have suggested that a key cause is JVCs' eviction of smallholders from the land they had been cultivating. Others have posited that while the JVCs or other private largeholders (*privados*) have not acquired lands that legally belonged to smallholders, the JVCs' presence has nevertheless generated land conflicts for two reasons. First, the JVCs and *privados* have acquired land-use rights for *blocos* formerly possessed by now-defunct state farms. These *blocos* themselves could be seen as an unjust colonial legacy that entailed the dispossession of smallholders from their land and compressed smallholders onto more marginal areas. Second, smallholders moved onto and cultivated these areas during the war years of the 1980s and early 1990s, when the state farms no longer had the resources to cultivate the land. The more recent arrival of JVCs and *privados* holding provisional or permanent titles could be generating conflicts with smallholders who have been cultivating the areas for ten years or more.

## Research questions

The recent land legislation provides remedies for smallholders who experience land conflicts with outsiders by mandating community consultation when investors seek land concessions in rural areas.

- What is the perception and experience of smallholders with regard to tenure security?
- What has been the experience of returning refugees seeking to cultivate traditional lands?
- Given Mozambique's low population density and traditional smallholder production technologies, it is assumed that land access is abundant for rural households. To what extent is land an abundant resource for rural households?
- For households with relatively small farm sizes, to what extent do other, nonfarm income-generating opportunities exist?

## Findings

- Smallholders perceive their land tenure security to be weak. Four out of five respondents across the sample of 521 households reported that land conflicts were a serious concern in their communities while nearly half expressed concern about losing land in the future. An analysis of smallholder experience with conflicts demonstrates that JVCs and *privados* are an important source of the problem. Across the study zone, one-half of all smallholder conflicts were with either JVCs or *privados*.
- The existence of land conflicts between largeholders and smallholders has caused some to criticize the JVC model of promoting smallholder integration into the market economy. It is important to move away from this perspective rooted in the assumption that largeholders and smallholders are inherently involved in a zero-sum struggle over land. While land conflicts between smallholders and JVCs are problematic, the JVCs have brought positive contributions including improved inputs and credit, investment in rural roads, and rehabilitation of cotton-ginning facilities. While JVCs may be associated with a number of land conflicts, this may also be attributed to the fact that they introduce vibrancy into local economies that increase the demand for agricultural land. This vibrancy has, at least in the case of prime parts of Montepuez and Monapo Districts, attracted individuals to relocate to these regions in search of economic opportunity and high quality land, further exacerbating the potential for land scarcity.
- One-half of all land conflicts experienced by smallholders were with other smallholders. This challenges the belief that the principal cause of tenure insecurity in rural areas can be attributed to outsiders and suggests that understanding the dynamics of local-level tenure systems is increasingly important.
- Almost all policy attention related to land tenure in Mozambique has focused on reforming the legal framework. While the new land law is a positive step, we suggest that government focus more on smallholder land-access issues. When we analyzed the relationship between land access and household income, two clear patterns emerged. First, in each study zone, fully one-quarter of the population has access to approximately 0.5 hectare per laborer while the richest quarter of the population owns 3-5 times that amount. Second, household income is closely linked to farm size. In short, with a weak nonfarm economy, those with less land access than their neighbors are likely to be significantly poorer. These results challenge the

perception of a land-abundant countryside and suggest the importance of improving the understanding of the reasons behind these variations.

Based upon conclusions drawn in the text, we offer the following recommendations:

1. Government and certain civil society organizations should continue to concentrate on defending smallholders that are involved in conflicts with economically or powerful outsiders. On the other hand, these organizations should also focus upon constructing new and mutually beneficial relationships between local communities and potential investors. The civil society's National Land Campaign's fourth message articulates this theme quite effectively. *Article 27(3) of the recently approved land regulations permit local communities to establish such partnerships by effectively negotiating community land use rights with potential investors.* These partnerships will need to be negotiated with caution and with the assistance of outside actors within government or civil society. Yet, this represents a new and exciting opportunity that could allow local communities to view investment more positively and benefit more directly from land-based resources for which they have acquired full land use rights.
2. Current government and NGO efforts to delimit or demarcate community lands should be pursued on a pilot basis and with the objective of facilitating meaningful integration of smallholders and largeholder economic activities rather than their geographic separation. Some advocates of the community delimitation approach have viewed it as an opportunity to protect smallholders *from* larger investors. Yet, the results from the Cotton Belt clearly demonstrate that even if one protects smallholders from larger companies, a more vibrant local economy will still give rise to conflicts within communities and among smallholders. As such, delineating local communities *could* have little effect on perceived tenure security or the frequency of land conflicts.
3. The new land regulations permit local communities to effectively negotiate community use rights with potential investors. As such, community land delimitation's primary goal should be to strengthen the rights of local communities so that they can negotiate more meaningful partnerships with private investors.
4. Although this report emphasizes that a sizable proportion of land conflicts takes place between smallholders themselves, a significant percentage of conflicts occur between smallholders and JVCs and other largeholders. Many of these largeholders have use rights that remain provisional. Significantly, Article 46 of the recently approved land regulations requires that these requests that remain "in the pipeline" be subject to the new land law and regulations. This will likely lead to the modification, if not cancellation, of many of these provisional use rights as they often correspond to areas currently occupied by smallholders. While this is an extremely positive development, the government needs to rapidly develop a procedure for dealing with the thousands of "concessions in the pipeline" (*em tramitação*) that were initiated under the former legal framework.
5. With respect to the "largeholder" sector, it important to establish mechanisms that discourage the acquisition of land use rights by entities with little capacity or desire to actually execute

their proposed agricultural activities. Safeguards need to be established to prevent largeholders from diminishing the rights of others. However, policies should be designed to encourage a mutuality of interests between largeholders and smallholders in structurally long-term and productive economic and social relationships.

6. Our survey data clearly demonstrates that non-natives are attracted to areas if they perceive that the area has economic opportunities. This can contribute to land conflicts and tensions between native and non-native residents. More research is necessary to determine which groups, if any, tend to be advantaged or disadvantaged in these dynamics. Such research should also identify ways in which the government and/or civil society institutions can influence local land allocation and adjudication systems so that they are equitable for all community members.
7. It is frequently assumed that local-level tenure systems have their “own” ways of handling conflicts and that community members tend to perceive those adjudication mechanisms as fair and legitimate. The fact that only a small percentage of smallholders who lost land they perceived as their own to other smallholders received any compensation suggests that these local-level adjudication systems are not perfect. There is a need for understanding more precisely how these systems work and whether the government can introduce changes in these systems without adding yet another artificial and ill-functioning institutional layer on local communities.
8. There is still considerable debate on whether or not there exists differential size of landholdings among farmers in the smallholder sector. Some observers have criticized on methodological grounds the findings reported in this study concerning the relationship between land access and household welfare. Some have produced their own quantitative data based upon surveys in which smallholders declared the size of their areas. Others contend that the land area data that have produced the findings from both sets of studies may be inaccurate for some households, given that this variable was based on area declared by smallholders rather than through field measurements. This is a potential problem and can only be remedied through additional research in which, among other things, fields are actually measured. Marrule (1998) has already done research in Nampula Province and has produced findings consistent with the results cited above. There is nevertheless considerable need to examine these issues across a wider geographic spectrum both to further confirm these findings and, more importantly, to provide insights into why the size of landholdings may vary across smallholder households.

Figure 2-1. Map of Mozambique



Map No. 3706 Rev. 2 UNITED NATIONS  
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# Challenging Conventional Wisdom: Smallholder Perceptions and Experiences of Land Access and Tenure Security in the Cotton Belt of Northern Mozambique

## I. INTRODUCTION

The Council of Ministers recently approved regulations to accompany the land law that went into effect 1 January 1998. A critical impetus behind these actions was recognition that a new legal and regulatory framework was required to reduce the incidence of largeholder-smallholder land conflicts that, according to press reports, had been increasing in both frequency and intensity. Indeed, millions of hectares of land concessions had been provisionally granted under the former legal framework with apparently little or no consultation with local communities to determine whether smallholders were already occupying the land being requested. Smallholders rarely have any form of written title to prove occupancy or use of land which they may have used for years, or even generations. The new law states that occupancy-based rights are equal to those of entities acquiring use rights through a formal titling process, hopefully improving tenure security for many.

In light of this legislation, the Inter-Ministerial Land Commission and other institutions established the Land Campaign (*Campanha de Terras*) to develop and implement informational programs related to the new legislation in rural areas throughout the country. Consequently, non-governmental organizations such as the *Organizacao Rural de Ajuda Mutua* (ORAM) and the *Uniao Nacional de Associacoes Camponeses* (UNAC) have begun assisting smallholders experiencing conflicts with private investors seeking to acquire land in rural areas.

*A conventional wisdom has developed that the only major problem with respect to land tenure security and conflict stems from largeholders acquiring—or seeking to acquire—land which non-titled smallholders already occupy.* A fundamental objective of the new land law and regulations, therefore, was to establish safeguards for local communities and smallholders vis-à-vis largeholders.<sup>2</sup> We examine smallholder attitudes in six districts of northern Mozambique using rural household data collected between 1994 and 1996 among a sample of 521 randomly selected households. Results derived from these data provide a useful benchmark with respect to attitudes held by smallholders in the period between the end of the war and passage of the new land law. We believe these results will be particularly useful to future researchers wishing to study changes in rural household attitudes about key tenure issues once the new legislation has taken effect.

Using the smallholder survey data, we challenge two further aspects of conventional wisdom about land tenure in the smallholder sector:

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<sup>2</sup> Some potential remedies envisaged by the new law include a structured process for community consultation in land titling and community land demarcation and delimitation.

- *Conventional Wisdom 2*: To the extent that smallholders experience land conflicts with their neighbors, adequate mechanisms exist within traditional authorities to adjudicate these issues in a manner acceptable to community members involved in such disputes.
- *Conventional Wisdom 3*: Given Mozambique’s low population density and traditional smallholder production technologies, land access is abundant for rural households whose livelihood depends largely on agricultural production.

We hope that analysis in this report informs and promotes a fruitful dialogue between Government, the research community, the donors and PVOs related to these three issues surrounding smallholder land tenure and access.

This report has seven sections. Following this introduction, we provide background information on land use patterns among JVCs, smallholders, and larger private landholders in the Cotton Belt. Section III discusses the specific research questions, sampling strategy, and the division of the overall sample into five study zones. Section IV provides background on the characteristics of the five study zones while Section V examines smallholder experiences with conflict and their perceptions of tenure security. In Section VI, we examine the differential size of landholdings within the smallholder sector and argue that while more research is necessary, dynamics within the smallholder sector challenge the notion that land is abundant and local communities are relatively homogenous. Section VII provides conclusions, recommendations to the government and the NGO community and priorities for future research.

## **II. LAND USE PATTERNS IN THE COTTON BELT: JOINT VENTURE COMPANIES, SMALLHOLDERS, AND *PRIVADOS***

Large portions of northern Mozambique are favorably endowed for the production of cashew nut, cotton, and a broad range of food crops. Following independence, the Mozambican government pursued an agricultural strategy that, like those of the colonial regime it replaced, emphasized the production of cashew and cotton for export. Cashew production was concentrated in the littoral and intermediate zones and has almost exclusively been a smallholder crop. The Cotton Belt, zones where agroecological conditions are favorable to cotton production, comprises much of the intermediate and interior portions of Mozambique’s northern three provinces of Cabo Delgado, Nampula and Niassa (see Figure 2-1, page xii).

During the colonial period and to the present, cotton has been promoted both as a smallholder crop and through large-scale direct production on large blocks of land. During the colonial era, the Portuguese initially relied upon coercion to compel Mozambican smallholders in these regions to cultivate one-half to one hectare of cotton on their own land. Portuguese settlers and private companies were allocated larger areas—*blocos*—upon which they produced cotton through reliance upon wage labor and mechanized technologies. As the land allocated for *blocos* were usually the most fertile and advantageously situated in terms of access to markets and/or transport infrastructure, smallholders were frequently occupying those lands when the

settlers or companies arrived. As a result, many of the *blocos* were created as a consequence of dispossessing and forcibly removing smallholder communities (Isaacman 1996).

Following independence, the Mozambican state nationalized the larger colonial companies, transforming them into state farms. These state farms attempted to continue similar production strategies as their colonial predecessors, though in a manner, according to official policy, that was less exploitative of smallholder producers.<sup>3</sup> With few exceptions, the post-independence government rarely re-allocated land to smallholders claiming to have had land taken from them during colonial rule.

### **A. JVCs and the Smallholder Sector**

In the late-1980s, the Mozambican government, acknowledging the failure of the state farm sector in the Cotton Belt, invited three multi-national firms to form joint-venture companies (JVCs) with the government to revive cotton production systems in selected “areas of influence” in Nampula and Cabo Delgado Provinces. In Nampula, the government dismantled the former state farm, *Empresa Estatal de Algodão de Nampula* (EEAN) and formed separate JVCs with *Grupo Comercial João Ferreira dos Santos (Sociedade de Desenvolvimento Algodoeira de Namialo—SODAN)* and *Grupo Entrepasto (Sociedade Algodoeira de Monapo—SAMO)*. In Cabo Delgado, the government signed an agreement with Lonrho Mozambique Agro-Industrial Company (LOMACO), a JVC that was already operating in several other provinces.

The Government’s policy to promote smallholder cotton production through JVCs was partially designed to increase smallholder cash income and improve food production through enhancing the availability of agricultural inputs, extension services and providing a guaranteed market outlet for seed cotton. The JVCs, partially in return for favorable monopsonistic privileges and varying tax exemptions, were also to inject capital to rehabilitate ginning facilities, rural roads and other infrastructure.

Based upon their contractual agreements with the state the JVCs have pursued three different cotton production strategies. First, the JVCs have initiated direct agricultural production systems for which they employ permanent and seasonal labor. These contracts are not clear on the duration of the land use rights nor on the precise size of JVC holdings. In any case, the JVCs received use rights on some blocks of land that had been formerly controlled by state farms that virtually ceased functioning by the late-1980s.<sup>4</sup> In Montepuez District, for example, LOMACO cultivated 1,252 hectares in direct production during the 1994/1995 agricultural campaign (SEED, Vol. 2, p. 18). Pitcher (1996) reports that in 1993-1994, SODAN engaged in direct

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<sup>3</sup> In practice, the post-independence government often employed similar methods for encouraging or even compelling cotton production in the smallholder sector (See Isaacman 1996, p.13-16; Pitcher 1998).

<sup>4</sup> For a discussion of these issues, see Pitcher 1996 and Myers, West and Eliseu, 1993, p. 48-57. Myers, West, and Eliseu report that in 1993 officials from LOMACO expressed concern that their land use rights were legally ambiguous and that the former colonial enterprise, SAGAL, could return to claim lands that LOMACO was using. At the same time, LOMACO was apparently allocated a total of 39,000 hectares upon which it could engage in direct and block production.



production on approximately 1,000 hectares on lands formerly controlled by the defunct state farm, *Empresa Estatal de Algodao de Namputa*.

The JVCs have relied upon a second production strategy on some of the blocks for which they have been granted provisional land use rights. Instead of engaging in direct production, they have divided the blocks and allocated annual use rights of one-half to five hectares to selected smallholders under contract farming arrangements. In these *blocos*, the JVCs provide seeds and insecticide credits to individual smallholder farmers (“low-input block”). In some cases, the JVCs provide fertilizers, herbicides and tractor services to smallholders cultivating JVC block land (“high-input block”). Participating smallholder households receive temporary land use rights from the company and are responsible for cultivating their parcels individually or through labor that the households themselves hire. The JVCs are then required to purchase seed cotton from participating farmers at (or above) a price established by the *Comissao Nacional de Salarios e Precos*. During the 1994/95 agricultural campaign, smallholders in Montepuez district cultivated cotton on 636 hectares of LOMACO block land and on approximately 4,000 hectares of block land in the SODAN and SAMO areas of influence in Monapo and Meconta Districts (Pitcher 1996; Strasberg 1997).

While the block production schemes may offer a variety of advantages to participating smallholders and the companies themselves,<sup>5</sup> there has been some concern that the production arrangement could generate land conflicts for two reasons. First, although the company retains the legal right to bar smallholders from participating in these *blocos* from year to year, many of the participating smallholders have cultivated a particular parcel for several consecutive years. As a result of continuous cultivation, these smallholders may perceive that they have acquired individual land use rights, regardless of whether this was officially stated in the (unwritten) contract between the firm and the smallholder. When a company decides to cancel these use rights, as LOMACO did in Mararange in 1996, one of the Montepuez study villages, many smallholders perceive that they are engaged in a conflict regarding land believed to be their own. A second source of tension over block land is the fact that following independence, many smallholders were cultivating parcels on block land that the state farms did not have the capacity to cultivate. From the perspective of these smallholders, they had effectively secured use rights on land that the JVCs with more capital and managerial capacity were now attempting to reclaim.

The third and most pervasive JVC agricultural production strategy is based upon outgrower schemes in which the companies enjoy monopsony rights over smallholder cotton production in large geographic expanses (“zone of influence”).<sup>6</sup> Termed *concessões de fomento*, these contractual arrangements do not confer upon JVCs any direct land use rights. Smallholders grow cotton on their own parcels and retain full use rights over that land. Participants secure access to these parcels through a variety of mechanisms at the local-level, including inheritance, allocation

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<sup>5</sup> For a discussion of the advantages of disadvantages of these schemes for the JVCs as well as smallholders themselves, see Strasberg 1997.

<sup>6</sup> See Table 2-1 for a list of the districts comprising each of the companies’ areas of influence.

by a parent or relative, clearing with or without the approval of a local leader (traditional authority, secretary, production chief), or sales and rental.

The monopsonistic cotton concessions, while not conferring any land use rights to JVCs, nevertheless grant them the exclusive right to purchase cotton that smallholders are producing on their own dispersed plots. The JVCs must pay the producers a price at or above a minimum level that the National Commission of Salaries and Prices establishes annually.<sup>7</sup> The JVCs, in return, are responsible for providing credit in the form of seeds and pesticides, to be deducted from the smallholders' total sale at the cotton markets each year (Strasberg 1997, p. 9-11; Pitcher 1998; Pitcher 1996b).<sup>8</sup> During the 1993/94 agricultural campaign, smallholders participating in LOMACO's outgrower scheme involved 16,180 smallholders in four districts of Cabo Delgado and approximately 65,000 smallholders in the SODAN and SAMO areas of influence in Nampula and southern Cabo Delgado.

## **B. Larger Private Landholders (*Privados*)**

Although smallholders and JVC are the primary producers of agricultural commodities in the study zones, some of the districts in the study zones have been marked by an influx of private landholders seeking definitive land use rights. This influx has often produced land conflicts and/or uncertainty among smallholders regarding their tenure security. Indeed, despite the fact that the previous legal framework articulated a desire to protect non-titled smallholders, private landholders (*privados*) have acquired provisional or definitive use rights for land that smallholders have occupied for generations. Table 2-2 provides information on the size, purpose and status of a number of land concessions for the six districts included in this study.

The data itself provides some insights into the situation within the districts but should be interpreted cautiously for several reasons. First, the apparent population densities can be misleading since population density varies across regions *within* a district, a fact that the district-level data obscures. For example, while Montepuez appears to have a low population density, most of the district is forested, has few roads and much of it is currently inaccessible to human settlement. The actual study zone within Montepuez is much more densely populated than the district-level figures would suggest. Second, data on land use rights that have been granted to JVCs do not appear in the table. This significantly under-represents the amount of land for which smallholders can secure individualized and permanent use rights. For example, it has been suggested that LOMACO received land use rights for 39,000 hectares in Cabo Delgado, the

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<sup>7</sup> Chapter 2, Article 2, of the Ministry of Agriculture's *Regulamento para a cultura de algodao* defines "smallholder" as any economic entity growing under 20 hectares of seed cotton in a particular year. These producers are required by the *Regulamento* to sell their seed cotton to the JVC designated to operate in their geographic area. Those with larger holdings, whether within or outside of a JVC area of influence, may sell their seed cotton to whomever they choose.

<sup>8</sup> For example, the contract between Lonhro International Limited and the GOM, *Autorização do Projecto LOMACO Montepuez* (1990) states: "LOMACO-Montepuez, in the region of Montepuez, will develop ... rural extension services for cotton and other crop production together with family sector farmers." The *Autorização do Projecto SODAN* (1990, p.1) contains nearly identical language on this issue.

largest percentage of which are in the relatively densely populated regions of its four district area of influence (West and Myers 1996, p. 44).

Third, the land use requests do not necessarily translate into definitive use rights associated with agricultural activity on the entirety of the requested lands. Indeed, Article 46 of the land regulations stipulates that land applications initiated under the previous legal framework must undergo a new—or perhaps for many, first time—local community consultation process. (Kloeck-Jenson 1999)

Most *privados* seeking land use rights are not actually initiating agricultural activities on the land in question. Many appear to be attempting to secure use rights so that in the future they could transfer or, if land is privatized, sell those rights to other investors with sufficient capital. In addition, most of the requests had not received definitive approval and remained provisional or precarious (“*em tramitação*”) in early 1996 when the survey data was being collected.

Nevertheless, it is important to emphasize that entities with “precarious” use rights had government permission to begin using the requested land; they simply had no government guarantee that those use rights were definitive for a period of up to fifty years.<sup>9</sup> Whether they had initiated agricultural activities on the requested parcels or not, the mere existence of the provisional rights generated considerable uncertainty amongst smallholders that were frequently adjacent to or residing upon the land in question. Indeed, as will be discussed in more detail below, sixteen percent of the disputes that smallholders reported in the LTC/FSP survey were with *privados*.

### **III. RESEARCH QUESTIONS, SAMPLING STRATEGY, AND DIVISION OF SAMPLE**

#### **A. Research Questions**

JVC cotton-related activities in Northern Mozambique have generated substantial debate on a number of issues, including the implications for smallholder food security as well as smallholder access to land.<sup>10</sup> Some have suggested that land conflicts and smallholder concerns about tenure

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<sup>9</sup> The recently approved land regulations include articles that will require such processes to be subject to the requirements of the new land law, including community consultation regarding the occupancy status of the land in question. As a result, many of the provisional/precarious use rights currently enjoyed by *privados* will likely be rescinded.

<sup>10</sup> With respect to food security, MAP/MSU FSP research has demonstrated that over a two-year period, caloric intake and smallholder income were higher among households participating in cotton outgrower schemes in JVC areas than non-cotton growing households. For example, the FSP Nampula/Cabo Delgado study found that, all things being equal, per capita incomes increased by between 25 and 36 percent in zones of significant JVC investment relative to non-cotton growers when the company supplied seeds and insecticides to smallholders for production on their own dispersed fields or on “block” fields (Strasberg 1997, p. 232-239). More definitive assessments of the effects of cotton production on smallholder income and food security necessitate further research

security are a significant problem in the cotton-producing areas where JVCs operate and have suggested that a key cause is that JVCs have been evicting smallholders from their holdings within areas of influence. Others have posited that while the JVCs or other *privados* have not necessarily acquired lands that legally belong to smallholders, their presence has nevertheless generated land conflicts in two respects. First, the JVCs and *privados* have perhaps only acquired land use rights for *blocos* formerly possessed by the now defunct state farms (which prior to independence colonial companies and settlers had owned). These *blocos* themselves could be perceived to be an unjust colonial legacy that entailed the dispossession of smallholders from their land and which compressed smallholders onto less expansive and more marginal areas. Second, it has been argued that the reactivation of JVC and *privado* activities on former *bloco* lands has generated conflicts because, during the 1980s when the state farms no longer had the managerial, material, or financial resources to cultivate these areas, smallholders had effectively moved onto and occupied these areas. The re-occupation by different largeholders could be generating conflicts with smallholders that have now been cultivating some of these areas for perhaps more than ten years.

The LTC Mozambique Project had documented a number of smallholder conflicts reported on land formerly held by the state using a case study methodology in several studies beginning in 1991. In an effort to analyze these questions in a statistically rigorous way and determine whether these tenure-related conflicts were confined to the areas of the case studies or were more widespread, LTC collaborated with the MAP/MSU Food Security Project to carry out a survey in Montepuez District (Cabo Delgado) and Meconta, Mecuburi, Monapo, Namapa, and Ribaue Districts (Nampula). Prior to the LTC survey in January-February 1996, FSP had visited the same sample of 521 households at regular four month intervals between 1994 and 1996 for purposes of assessing the impact of participation in cotton-production schemes on household income and food security. FSP gathered data concerning household landholdings, production, income, consumption and demographic characteristics. By using the LTC and broader FSP data in this report, we investigate smallholder perceptions of tenure security and actual experiences with land conflicts and their relationship to socioeconomic variables across the sample.

In particular, this report addresses the following research objectives and sub-objectives:

**1. Characteristics of smallholder farms, land size and methods of land acquisition.**

- a) What is the size of smallholder farms in the Cotton Belt?
- b) What are the demographic characteristics of the study zones?
- c) What are the cropping patterns, income sources, and key determinants of caloric intake across study zones?
- d) By what methods do smallholders gain tenure or use rights to land?

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over a longer-time period. Nevertheless, the existing FSP data and the continuing enthusiasm among smallholders for participating in these schemes suggest that cotton production has produced material advantages for many participants.

## **2. Smallholder perceptions of the seriousness of land tenure conflicts.**

- a) What proportion of households perceive that land tenure conflicts represent a community problem?
- b) To what extent do smallholders perceive that land tenure conflicts are likely to intensify or lessen in the future?
- c) To what extent do smallholders in favorable zones perceive that the arrival of new individuals and households represents a problem with respect to land availability?

## **3. Smallholder experience with land disputes.**

- a) What proportion of households have experienced land disputes?
- b) What are the characteristics of households who have been most (least) likely to experience disputes?
- c) To what extent are land disputes about ownership, use rights or parcel borders?
- d) With whom do smallholders report having such conflicts? (JVCs, *privados* or other smallholders)
- e) What has been the resolution of these disputes?

## **4. Differential size of landholdings and access issues in the smallholder sector.**

- a) To what extent is land access concentrated or equal among smallholders in terms of land to labor ratios?
- b) By what methods do smallholders gain tenure or use rights to land?
- c) What are the demographic and socioeconomic characteristics (e.g., income, calorie availability) of households who enjoy greater (lesser) access?

## **B. Sampling Strategy and Representativeness**

As noted above, the sample upon which the current report is based was originally selected by FSP in 1994 to meet research objectives that were not primarily focused upon land tenure issues. While the details of the FSP study objectives and sampling strategy are outlined in FSP Working Paper 22, a brief description is provided here to help the reader understand the statistical representativeness of the joint LTC/FSP sample of 521 households.

The FSP motivation in its research design was to understand the effects of smallholder:JVC agricultural production schemes on household welfare and the macroeconomy and to recommend steps the government should take to enhance the contribution cash-cropping makes to rural development. As such, the sample frame was limited to those villages with at least 20 cotton growers based on the 1992/93 growing season, the most recent period for which data were available.

A 1993 Rapid Rural Appraisal in Nampula Province determined that smallholder:JVC contracting arrangements varied along two dimensions that were hypothesized to influence smallholder welfare differently (MAP/MSU FSP1994). These factors were:

1. whether smallholders grew cotton on land provided by the JVC (block) or on land acquired through the customary/traditional tenure system (dispersed); and
2. the level of chemical inputs used on cotton plots. The only chemical input the vast majority of smallholders growing cotton on their own dispersed fields or cotton was insecticide. An experimental group of PUPI (*Pequenas Unidades de Produção Intensivas*) farmers, however, were provided seed, fertilizers and herbicides in addition to the insecticides. They could therefore use these inputs on block land that LOMACO subdivided and lent to them on an annual basis.

Table 3-1 displays the number of villages within the sample frame of the three study zones (LOMACO, SODAN/SAMO, CARE-OPEN) which FSP established during their research on food security issues. The table also lists the number of villages where each cotton-production system was present and the number of villages selected within each zone/cotton production system combination. Factors 1 and 2 provided the rationale for a multi-stage quasi-experimental sampling design implemented in 1994. These stages included:

1. Establishment of two JVC study areas: LOMACO and SODAN/SAMO:
2. Within the four-district LOMACO area of influence, Montepuez district was selected because it had a significant number of villages with both PUPI and low-input cotton producers;
3. SODAN and SAMO, operating in the neighboring districts of Monapo and Meconta, were grouped for sampling purposes. Early research results indicated that these firms were similar to each other (and different from LOMACO) in terms of their relationship with smallholders.<sup>11</sup> Each provided cotton-producing households with seed and insecticide but neither offered the more intensive input packages (e.g., fertilizer, herbicides) that LOMACO was providing some smallholders.
4. To ensure meaningful sample size within each zone:strata combination (e.g., SODAN/SAMO block, dispersed, and non-cotton producers, LOMACO PUPI block, dispersed and non-cotton producers), the universe of villages within each study zone was identified according to the production systems present. The presence of block land was a key stratification variable, given that dispersed and non-cotton producing households were believed present in nearly all villages.

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<sup>11</sup> See also Pitcher 1996.

5. A third study zone—CARE-OPEN—was also established as a control group given its similarity in terms of agroecological characteristics for cotton production but its lack of significant JVC presence.<sup>12</sup>
6. Within each selected village, a household-level census was conducted to identify households by their cotton production category. A random sample of 12 households from each relevant cotton production category was selected within each study village.

The sample of households is displayed in Table 3-2 by study zone and cotton production category.<sup>13</sup>

In a strict statistical sense, study results are representative of only those areas included within the sample frame. Table 3-2 also includes the number of households by zone and cotton production category of which the study is statistically representative. Within the Montepuez and Monapo/Meconta regions, this population includes the 32,964 households estimated to reside within the 125 villages that could have fallen into the sample; these 125 villages represented all communities with at least 20 cotton-producing households based on the 1992/93 cropping season. Within the CARE-OPEN zone, the sample is statistically representative of the 12 villages in Mecuburi, Ribaué and Namapa that participated in the first phase of the oilseed press project in 1994/95; the population of these 12 villages is estimated at 6,391 households.<sup>14</sup>

Several factors suggest much wider geographic generalizability of study results, however. First, the entire Cotton Belt is agroecologically endowed with a similar range of soil types, rainfall levels and altitude, giving rise to similar agricultural potential throughout. Second, the regions are generally dominated by the Macua ethnic group and had similar histories during the colonial period with respect to cashew, cotton and food crop strategies. Third, informal interviews with JVC, NGO and Government officials suggest that each JVC operates in a similar fashion vis-à-vis smallholders throughout the whole of their areas of influence. For example, the types of relationships and levels of investment that LOMACO has with smallholders in Montepuez District is similar to patterns found in the three other districts—Ancuabe, Balama and Namuno—which comprise its area of influence in Cabo Delgado Province. As such, study results are broadly generalizable to the interior regions of northern Mozambique where cotton is

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<sup>12</sup> CARE-Mozambique and MAP/MSU FSP researchers collaborated on the first round of data collection in March 1995 as part of CARE's baseline survey activities for its OPEN project. See CARE-Mozambique (1996) for further details on this aspect of the study.

<sup>13</sup> The number of households interviewed in Round 5 of the study is presented in Table 3-2 by study zone, and in the Appendix on a per village/cotton production category basis. The number of households interviewed in each village/cotton production category frequently differs from the initial goal of 12 households. This is due to a variety of factors, including: (a) less than 12 households existed within a particular category in some villages; and (b) attrition of some households over the 20 month period from Round 1 to Round 5.

<sup>14</sup> All statistical results within this report are weighted to compensate for the fact that households within the selected villages had unequal probabilities of being selected, depending on their cotton production category. Weighting thus permits statistical representativeness of the sample of 521 households to the population of 39,355 households estimated to live within the sample frame of 137 villages. See the Appendix for village population and sample size by cotton production category used to derive sampling weights.

or can be grown and where maize, manioc, sorghum, groundnuts and beans are the dominant food crops grown by smallholders.

### **C. Division of Sample into Five Zones for Purposes of Land Tenure Study**

The analysis in this report is *disaggregated into five zones* by grouping the 21 sampled villages according to four variables: presence of a JVC, presence of a high-input production system, the existence of blocks (*blocos*) in or near the village, and the accessibility of the village by road. These variables, displayed for each village in Table 3-3, are hypothesized to be associated with the incidence and type of land tenure issues of relevance to smallholders across the north.

#### **Study Zones One and Two: Montepuez Nropa and Montepuez Southeast**

For purposes of this study, we divide the FSP LOMACO category into two study zones: *Montepuez Nropa* and *Montepuez Southeast*. See Figure 3-1 for a map of these zones.

The four villages in the *Montepuez Nropa* zone are located in close proximity to the *Nropa Unidade da Produção* and share three characteristics:

- LOMACO has land use rights in or near the villages and is engaged in direct production of cotton and maize on relatively large areas that require the employment of seasonal and permanent laborers;
- LOMACO's high-input pilot project both on blocks (*Pequena Unidade de Producao Intensiva or PUPI*) and in dispersed production;
- A relatively high percentage (56 percent) of sampled households who grow cotton.

The three villages in the *Montepuez Southeast* set are in geographically separate parts of the district from the Nropa set. These villages differ in important ways from Montepuez Nropa and are homogenous with respect to the following characteristics:

- LOMACO has no land use rights in the area and is not involved in either direct production or smallholder block schemes in close proximity to these villages;
- No households used fertilizer, herbicides or mechanized farm equipment (high-input schemes) in their crop production during the study period;
- Only 15 percent of sampled households in the Montepuez Southeast cultivate cotton; LOMACO's influence and impact on smallholders in these villages is therefore likely to be less intensive than in the villages in the Nropa set.

#### **Study Zones Three and Four: Monapo and Corrane (Meconta District)**

For purposes of the land tenure study the nine villages have been divided into two zones: *Monapo* and *Corrane*. Like the villages in *Montepuez Nropa* and *Montepuez Southeast*, all of the villages in *Monapo* and *Corrane* are marked by the presence of a JVC. Unlike *Montepuez Nropa*, however, SODAN and SAMO have not established any high-input production schemes. Like *Montepuez Nropa* and unlike *Montepuez Southeast*, all of the villages in the *Monapo* and *Corrane* sets have land blocks located within or near them upon which the JVCs are engaged in



direct production or have temporarily allocated parcels to individual smallholders. See Figure 3-2 for a map of these zones.

The *Monapo* set is comprised by six villages in Monapo District and one in Meconta District that is located adjacent to the Monapo/Meconta district border and near the SODAN cotton gin in Namialo. The seven *Monapo* villages are similar in the following key features that differentiate them from the two villages in the *Corrane* set:

- The *Monapo* villages have relatively good access to the main national highway or principal secondary roads and rural/peri-urban markets (e.g., Namialo, Monapo-Sede). The *Corrane* villages, however, were relatively isolated as a result of poor transport infrastructure at the time of the survey in early-1996. The 75 kilometer road from Nampula City to Corrane was nearly impassable. SODAN had done some basic rehabilitation on the 60 kilometer road linking Meconta-sede and Corrane sede, but it was nevertheless in poor condition.
- The *Monapo* study zone had a higher number of *privado* claims and a greater intensity of actual agricultural activities on block land than in Corrane. In addition, the JVCs in *Monapo* area were engaged in direct block production of sisal and cotton.
- Soil productivity in the *Monapo* region appears to be poorer than that in the *Corrane* set because of wartime dynamics. During the civil conflict, the *Corrane* villages suffered substantial violence, causing most of the inhabitants to flee and relocate elsewhere. The villages in the *Monapo* data set, on the other hand, were part of a zone that the Frelimo government had devoted disproportionate resources to defending. As a result, most inhabitants remained throughout the conflict and were supplemented by thousands of displaced families that temporarily relocated to the region. All of these farmers continued to cultivate cotton and food crops during the civil conflict. Anecdotal evidence suggests that continuous cultivation, much of it cotton mono-cropping, has depleted the clay soils of essential nutrients over the years, diminishing its fertility (Tique 1996). Corrane, on the other hand, was left virtually abandoned for many years during the war, allowing soils to replenish key nutrients and soil fertility.

#### **Study Zone Five: CARE-OPEN**

Five villages were sampled within Mecuburi, Namapa, and Ribaue districts. These villages were randomly selected from the 12 villages where CARE-Mozambique began implementation of its OPEN project in 1994/95. This region is distinct from the other study zones because it does not have a JVC with monopsony rights vis-à-vis smallholder cotton; cotton promotion in these regions is done by two private firms who were significantly less capitalized than the JVCs: Cinpofim and Eduardo Pinto. Compared with the areas in the other four zones, relatively few land use concessions have been definitively or provisionally granted to largeholders in the CARE-OPEN zone. In addition, these villages at the time of the survey were, in comparison with Montepuez Nropa, Montepuez Southeast, and Monapo, relatively isolated from national or well-maintained secondary road networks and marked by low levels of agricultural commercialization. See Figure 3-2 for a map of this study zone.

## IV. CHARACTERISTICS OF THE FIVE STUDY ZONES

A fundamental premise of the quasi-experimental design underpinning sampling in this study was the assumption that the Cotton Belt was relatively homogenous throughout in terms of ethnic group (Macua), soil type, rainfall, altitude and agroecological potential. Had this been a true experimental design, any differences found between zones would have been attributable to the characteristics used to differentiate the five study zones: differences between JVCs; the contrast between zones with and without a JVC; the presence or non-presence of block land in or near the villages in a particular zone; and the accessibility of the area via road. Of course, no social science study can replicate a true experimental design. As such, it is critical to discuss in detail observable differences between and within zones before proceeding to analyze land tenure and dispute issues.

### A. Demographic Characteristics

Table 4-1 provides average levels of selected demographic variables for sampled households in the five study zones. On average, the demographic profile of households across the five study zones is quite similar with respect to household size, composition, and characteristics of the household head. For example, a typical sampled household in each zone has approximately five resident members, three of whom are adults, and is male-headed (98 percent).<sup>15</sup> Corrane has a slightly higher level of female-headed households (six percent) than all other zones where female-headed households represent less than three percent of the sample. Education levels are very low in rural Mozambique, with the typical household head achieving only two years of formal education, with little differentiation either between or within zones.

While Table 4-1 presents mean levels of these demographic variables, Table 4-2 displays a breakdown of sampled households based on the number of family members and the age of household head. Through this optic, we see clearly that household composition varies considerably. Household size ranges from one to 11 members, with the most common size at four members and with 370 of 521 households having between three and six members. The fact that household size varies so dramatically across the sample is important to an analytical issue within this report: the extent to which land access is relatively equal among smallholder households. In light of this variation, we will present such analyses on both a per household and a *per adult basis*. We would expect households with more available labor to have greater land access in a traditional tenure system where land was abundant. On the other hand, we likewise expect to find that this inequality would lessen markedly when taken on a per adult basis. Yet, as will be discussed in Section VI, there is a substantial difference in the size of landholdings within the smallholder sector, even when labor availability per household is taken into account.

There are two important demographic distinctions between zones apparent in Table 4-1. First, a significant number of households in Corrane (95 percent) and the CARE-OPEN samples

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<sup>15</sup> Throughout this report, the term adult refers to an individual above ten years of age.

(27 percent) were displaced at some point during the war. This reflects the fact that the Corrane zone witnessed significant violence throughout the war and that Renamo forces occupied the area for an extended period. The second significant demographic distinction is the percentage of household heads in each area that are native to the village where they were residing at the time of the surveys.<sup>16</sup> While 90 percent of household heads in Corrane and the CARE-OPEN zones were born in the communities where they currently reside, that figure drops to 75 and 72 percent for the Monapo and Montepuez Southeast study zones, respectively. Of greater significance, in Montepuez Nropa, only 29 percent of household heads are village natives.

As indicated in Table 4-3, it appears that there were three primary reasons for the migration of the non-natives to the villages in the Montepuez-Nropa zone. Approximately 27 percent were probably forced to move into the area as a result of two sets of Frelimo government policies in the 1980s (“Operation Production” and the communal village policy).<sup>17</sup> Second, approximately 17 percent indicated that they migrated to these areas to seek better security during the war. Indeed, during the war, Montepuez and Monapo districts were relatively secure zones that the Government prioritized in its military and economic strategies in an effort to protect important cashew and cotton interests in the region (Pitcher 1998; Myers, West and Eliseu 1993).

The third, and perhaps most important reason for moving into Montepuez Nropa area, however, is the perception that there may have been better economic opportunities. Indeed, 34 percent of the non-natives moved to the area seeking employment while an additional 11 percent sought land that perhaps was probably perceived to be more valuable since it provided smallholders the opportunity to participate in cotton outgrower schemes. Similarly, in the Monapo and Corrane zones, 47 percent and 26 percent of the non-native household heads moved to the villages seeking employment and land, respectively. As will be discussed below, to the extent that there is a higher incidence of land conflicts or high degree of perceived tenure insecurity in these study zones, it could derive from the fact that perceived economic opportunities in the area have attracted more people, thereby heightening population pressures and competition for land resources.

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<sup>16</sup> Native household is defined in this report as one in which at least one spouse from a household was born in the community in which they currently reside.

<sup>17</sup> “Operation Production” was an initiative launched in the early 1980s in which urban dwellers deemed to be “unproductive” were forced to move to the countryside as agricultural producers. The communal village policies were partly driven by a socialist program designed to encourage and enforce collective agricultural production initiatives as well as to concentrate geographically dispersed populations to facilitate the provision of social services (schools, health clinics, clean water). Significantly, the communal village policy by the mid-1980s was driven more by security than economic or developmental imperatives. At that time, communal villages in many areas were established less for production purposes than to provide security to, and control the movements of, populations during the civil conflict.

## B. Agriculture, Income and Calorie Availability

Table 4-1 displays farm and income characteristics as well as calorie availability data for sampled households across the five study zones. There are seven insights from this table which merit discussion in helping us to characterize the economies of the five study zones.

1. *There is a severe scarcity of income-earning opportunities outside of the household farm.* In fact, income derived from household production of food crops, cotton and cashew account for over 70 percent of all income generated by households throughout the year. Note that between 8 and 18 percent of household income is from labor sales and micro-enterprises, and that labor sales are most frequently made by individuals seeking to work on land owned and operated by either largeholders (including the JVCs) or other smallholders. In light of this situation, we would expect household welfare to be closely associated with agricultural productivity.
2. *There is a positive association between both household and per capita income levels and the intensity and presence of a JVC promoting cotton among the regions.* The three zones with the greatest proportion of households producing cotton in 1994/95, Montepuez Nropa, Monapo and Corrane each have average income levels similar to each other (\$58 to \$65 per capita). Income in the CARE-OPEN (\$48 per capita) and Montepuez Southeast (\$40 per capita) zones where there was less cotton investment and a smaller percentage of households engaged in cotton production was considerably lower.<sup>18</sup>
3. *Retained food crops for home consumption constitute, by far, the largest share of household income (45 to 66 percent).* Across the five zones, marketed food production represents between two and seven percent of household income. Two exceptions to this general pattern are found, however. In Montepuez Nropa, many of the households who participate in the high-input block cotton scheme with LOMACO also participated in a similar block scheme for maize production that permitted them to produce surpluses that could be sold. In Ribaeu, a district that has historically had high potential for maize production, several households reported significantly higher maize sales than their counterparts in the CARE-OPEN zone.
4. *Cotton is the second largest source of income in Montepuez Nropa, Monapo and Corrane, providing between 17 and 25 percent of household income across the three zones.* For the majority of households selling cotton, it represented, by far, the most important source for cash income.
5. *Historically the cotton belt has been an important cashew-producing area; however, at the time of the survey cashew contributed little to household income.* Cashew production in all

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<sup>18</sup> It is likely that differences between the two Montepuez zones reflect two factors: a) investment decisions on the part of LOMACO to concentrate its operations in particular areas; and b) relatively higher quality soils for cotton production in Montepuez Nropa than in Montepuez Southeast. With respect to the two Montepuez zones, we would anticipate that these differences would be associated with a lower degree of land conflict Montepuez Southeast since it appears to have less economic and agricultural potential. Note that this explanation is consistent with the earlier observation that Montepuez Nropa has witnessed significant in-migration among its current residents.

regions of Mozambique has witnessed dramatic declines since 1973 when the country was the world's leading cashew exporter. In recent years the African Development Bank (ADB), the United States Agency for International Development (USAID) and private sector agents have devoted sizable resources to stimulating cashew production in Nampula. On the other hand, little investment on the part of smallholders took place with respect to cashew holdings (e.g., new trees, pruning, top-dressing, disease treatment) prior to the end of field research for this study. While smallholders have, on average, between 21 and 38 cashew trees across the three Nampula zones, yields are low (1.5 to 2.0kgs raw nut per tree per year), and as such, cashew provides only three to six percent of average income for sampled Nampula households. Given the large amount of arable land planted with cashew trees, the results demonstrating how little cashew contributes to income are striking.

6. *Livestock represents an insignificant source of income for nearly all households.* While many households are beginning to rebuild their livestock holdings, several factors may make such recovery slow. These include: a) decimation of small ruminants and poultry during the war; b) tsetse fly infestation, making cattle a risky investment; and c) a low level of veterinary services available to support intensified livestock production in the smallholder sector.
7. *Although calorie availability per capita per day were higher in Monapo and Corrane than in the two Montepuez zones, a more detailed study of the data indicates that calorie and protein intakes periodically fell below the amount recommended in each of the study zones, particularly during the hungry season.* Average intakes reached only 1,551 and 1,377 in Montepuez Nropa and Montepuez Southeast during the hungry season (January 1996); these mean results are both considerably lower than the 2,200 calories per capita recommended for Mozambique (Rose, Strasberg, Jeje and Tschirley 1998).<sup>19</sup>

### **C. Cropping Patterns**

Further demonstrating similarity in agroecological conditions across the study zones, Table 4-4 shows that the relative importance of various food and cash crops varies little. Maize is most important in both Montepuez zones, Monapo and CARE-OPEN (tied with sorghum), while manioc occupies the largest area of Corrane households. Little specialization in terms of crop production is found, with the typical household producing four to five food crops each cropping season.

The majority of food crop area is intercropped, frequently with households planting leguminous, nitrogen-fixing crops (e.g., beans, groundnuts) in combination with grains (e.g., maize, sorghum) and tubers (manioc). In the absence of chemical fertilizers, this is an important method for preserving and promoting soil fertility. Intercropping is also a good soil conservation practice to control erosion in this region, since it provides ground cover to protect soil against

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<sup>19</sup> Households in four of the five study zones (excluding CARE-OPEN) were interviewed about their food consumption using 24-hour recall techniques during three rounds of data collection

direct exposure to direct and heavy rainfall on exposed soil. Likewise, intercropping is attractive to farmers in this region as a labor-saving technique; farmers who cultivate two crops on one field reduce the amount of labor required for field preparation, weeding and other activities (Tique 1996). By contrast, cotton in this region is almost exclusively mono-cropped, following the recommendations of JVC extension programs.

Not surprisingly, given the importance of cropping activities with respect to total income in each study zone, Table 4-4 displays a similar relationship in terms of the gross value of crop production per adult between the zones as mean income levels found in Table 4-1. The relatively intense cotton zones of Montepuez Nropa, Monapo and Corrane demonstrate significantly higher value of crop production on both a per household and per adult basis than is found in either Montepuez Southeast or CARE-OPEN.

#### **D. Farm Fragmentation**

Farm fragmentation is defined as the geographic dispersion or scattering of a farm into distinct and non-contiguous parcels (Blarel 1994). Table 4-5 displays selected statistics concerning the extent to which smallholder farms are fragmented in this study zone. Ninety-five percent of households own or cultivate three or more parcels, with the average number of parcels per household across the sample at approximately five. Table 4-5 shows a positive relationship between total farm size and the number of parcels held per household in each study zone as measured by the linear correlation coefficient. Further, this table shows the significant distances farmers must walk each way from home to field: 59 percent of all fields are 31 or more minutes from the household residence.

The issue of farm fragmentation has received little attention from the research community in Mozambique. However, given the fragmentation that exists for nearly all farmers across the zones and the significant amount of time and energy necessary to reach most fields, this is an important issue for future research. For example, is it the case that the long distances required to reach fields in these areas derive from a scarcity of high-quality land near village centers? Is fragmentation a rational response for farmers seeking to cultivate a range of food and cash crops requiring different soil characteristics that can only be found across a wider geographic area? Do micro-climates exist with differing rainfall patterns and pest cycles making farm fragmentation a useful way to diversify intra-annual risk across a given geographic area? Or, have inheritance patterns across several generations created a situation in which individual farmers today have inherited a series of plots that are fragmented and geographically dispersed?

Available data does not permit us to distinguish between these or other plausible explanations for farm fragmentation across the study zones. However, given the close relationship between farm size and number of fields, this issue represents an important area for future LTC/NET research.

## E. Mode of Land Acquisition by Use

Table 4-6 displays the mode of land acquisition for four land use categories: food crop, cotton, cashew and fallow for each study zone. Several clear patterns emerge regarding the types of crops cultivated on block land versus smallholders' own dispersed fields.

1. In each zone smallholders depend on land within the customary/traditional system for food crop production nearly exclusively (88 to 100 percent). Only in Corrane and Monapo do block fields represent even 10 percent of food crop parcels. This suggests that food security strategies by smallholders are largely dependent on land within the traditional system. To the extent that smallholder land access is constrained within the traditional system, land is generally not available via blocks to make up for this constraint.
2. When smallholders gain access to parcels within blocks, they nearly always cultivate cotton. To the extent that smallholders seek to cultivate these block lands, they probably do not have a choice—they must use it to grow cotton. In all probability this reflects the interest of the JVC (or *privado*) controlling the block's use at the time of the survey. From their perspective, cotton outgrower schemes are attractive due to their interest in short-term profits, capital constraint, risk preference and their lack of interest in promoting food crops, which have a much less certain output market.
3. There is a wide variation in terms of how smallholders gain access to land for cotton cultivation across the zones. In Montepuez Nropa, for example, blocks account for 16 percent of area that smallholders have planted with cotton while 84 percent of cotton cultivation takes place on the smallholders' own dispersed plots. This situation is markedly different from Corrane where nearly all cotton smallholder cultivation was done on blocks (92 percent). Blocks in Corrane were generally left in fallow during much of the war, as discussed above, and as such represent prime areas for agricultural production in the post-war era. Cotton yield data, as well as informal discussions with smallholders, suggests that Corrane blocks are nutrient rich, high in clay content, and as such have relatively high agricultural potential.
4. Land with cashew trees is exclusively found within the customary/traditional tenure system. This is logical, given that smallholder access to blocks has always been on a temporary use basis, thereby discouraging or proscribing smallholders from making long-term investments such as planting cashew trees. As Government and donors attempt to increase cashew production and income, it is clear that such improvements must come from land within the customary/traditional tenure system.
5. In each of the three zones where some households gain access to block land for cotton production, average farm size is greater for these households than their neighbors unable to gain such access. Consider, for example, the Monapo study zone, where the average farm size held by households is 4.42 ha. Households with access to block land to produce cotton have, on average, 6.18 ha, or nearly 50 percent more than their neighbors producing cotton on land held in the traditional system (3.81 ha) or non-cotton producers (3.15 ha). The same pattern is observed in Corrane and Montepuez Nropa. This suggests that access to block land

may be contributing to inequality in land access, rather than providing access to relatively land-poor households that may have been experiencing difficulties in acquiring access to land in the traditional or customary sector (See also Pitcher 1998, p. 135-137).

6. The resurgence of cotton production may be increasing pressure on land, thereby diminishing the amount of time land is left in fallow. Historically, permitting land to lie in fallow in the Cotton Belt during one or more cropping seasons has traditionally represented an important mechanism by which soil fertility has been maintained in a system where no chemical fertilizers have been used. Table 4-7 shows that, with an average farm size of 3.95ha across the sample, the average farm had 0.70ha in fallow during the 1994/95 cropping season. A recent study about land degradation and soil fertility management in Namialo (Meconta District) suggests that fallow periods have declined in recent years and that households in the area attribute this to growing land scarcity. According to Tique (1996), the re-introduction of cotton in these regions has resulted in “an influx of private farmers (who) have taken up large tracts of land.... These changes have resulted in the scarcity of land, making it difficult to practice shifting cultivation (and fallowing) ... the fallow periods are becoming shorter as competition for land has gone up.”

## **V. SMALLHOLDER PERCEPTIONS OF LAND TENURE SECURITY AND EXPERIENCES WITH CONFLICT IN THE COTTON BELT**

### **A. Conventional Wisdom: Are JVCs and Larger Landholders the Source of the Problem?**

In this section, we discuss smallholder perceptions of land tenure security and their actual experiences with land conflict across and within the five study zones. While the data will be used to provide an overall description of the types of conflicts and their frequency, it will also be used to assess the validity of a broader conventional wisdom upon which various academics and policymakers have relied in analyzing the problem of tenure security in Mozambique and formulating policy. This conventional wisdom suggests that land conflicts experienced by smallholders nearly always occur with larger private landholders or companies.<sup>20</sup> As discussed in the introduction, this perspective has contributed to a land law and an accompanying set of regulations that tend to view smallholders and largeholders as having opposing interests; the legal framework therefore establishes safeguards for local communities and smallholders that have acquired rights through occupancy rather than formal title.

In addition, the notion that largeholders are the primary threat to smallholder tenure security has led some to advocate community delimitation or demarcation endeavors with the objective of clearly delineating community boundaries. As will be discussed below, there are different approaches undergirding this activity. Yet, those adopting a zero-sum perspective on the land-

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<sup>20</sup> For a discussion of this issue, see O’Laughlin 1996 and Kloeck-Jenson 1998b.



related relationship between smallholders and largeholders view delimitation as a mechanism to geographically separate smallholders from larger investors. Once community lands have been delimited, according to this approach, investors would be able to acquire land use rights only on whatever land remains.<sup>21</sup>

The division of our sample into five study zones provides a useful opportunity to more rigorously examine the validity of this conventional wisdom. In particular, if it is true that most of the land conflicts which smallholders experience are with JVCs and *privados*, the data should indicate that the percentage of smallholders experiencing land conflicts are highest in Montepuez Nropa and Monapo. Both of these zones are relatively accessible and marked by the presence of JVCs and *privados* that are the most active in terms of direct and smallholder block production strategies as well as the acquisition of temporary and definitive land use rights. One would anticipate as well that perceived tenure insecurity would be highest in these areas. The incidence on land conflicts and tenure insecurity would be lowest in the CARE-OPEN areas since they are more isolated and there is no JVC and few *privados* in the zone. Given that LOMACO is present, but less active in Montepuez Southeast (no direct or smallholder block production), we would expect that Montepuez Southeast would have fewer conflicts than Montepuez Nropa and Monapo. Given its better road accessibility than the Corrane zone, we would expect Montepuez Southeast to experience more conflicts than Corrane. On the other hand, SODAN is involved in smallholder block production strategies in Corrane so this may encourage more conflicts, despite the relative inaccessibility of the area. To summarize, based simply on the conventional wisdom regarding largeholders as well as accessibility via road, one would assume that land conflicts and perceived tenure insecurity would be highest in Montepuez Nropa and Monapo. It would be followed by Montepuez Southeast and Corrane. One would anticipate that perceived tenure security would be highest and problems with conflicts lowest in the CARE-OPEN areas.

## **B. Smallholder Perceptions of Land Tenure Security<sup>22</sup>**

Table 5-1 presents results across the 21 survey villages concerning smallholder perceptions of land tenure security within their communities. Prior to discussing the results, it is important to be explicit concerning methods used in querying smallholders about these issues. Three questions asked of smallholders regarding their perceptions of land tenure problems within their communities within the LTC survey module included:

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<sup>21</sup> At a national seminar in Beira in August 1998, the government signaled its apparent willingness to move away from this orientation in its planned community land delimitation programs. For a discussion of these issues, see Tanner, de Wit, and Levy 1998 and Negrão 1998.

<sup>22</sup> We note that the analysis herein concerns smallholder perceptions and experiences with land disputes. Throughout this report, statistical results are based on answers provided by smallholders to survey questions. As such, these data reflect *smallholder opinions about these topics*. We do not intend through this report to suggest that any particular JVC, *privado*, traditional authority or smallholder is necessarily at fault in any or all disputes cited by smallholders. Rather, we hope this report encourages and informs a constructive dialogue between all relevant parties to lessen the extent of land disputes and encourage more effective and mutually beneficial partnerships between smallholders and larger investors in the future.

- Are conflicts over land a problem for the community? Respondents who answered yes were asked whether these conflicts were (i) becoming very serious; (ii) becoming somewhat serious; or (iii) not very serious.
- Are smallholders in your community worried about losing land? Respondents who answered yes were whether their concerns were (i) very serious; or (ii) somewhat serious;
- Is the arrival of new persons seeking land in your community a problem? Again, respondents who answered yes were whether their concerns were (i) very serious; or (ii) somewhat serious.

Results in Table 5-1 have been grouped such that if a respondent answered that their concerns about any of the three questions were “very” or “somewhat,” the response was classified as “yes” in the table.

*A critical finding of this research is that 83 percent, or over four of five rural households sampled, perceive that land conflicts are a problem within their communities.* In six of the 21 villages, this was a unanimous opinion. Only among households in the two Corrane villages, where 28 percent of the sample said they perceived a problem to exist, did we find significant differences from the other four study zones. Yet, even the figure for Corrane is cause for concern since these perceptions are found in a zone with such significant agricultural potential. We suggest that with more than one of every four households in each region concerned about tenure insecurity, an economic and social climate that will foster crucial agricultural investments is in jeopardy.

Answers to questions b and c are largely consistent with the responses to the first question regarding land conflicts being a problem in the respondents’ respective communities. Nearly one-half of all households report that smallholders within their communities are concerned about actually losing land in the near future; only 32 percent definitively said that it was *not* a concern. Similarly, 47 percent of the informants reported that the arrival of new persons (other smallholders) seeking land is a problem for their communities.

While results from the survey suggest significant apprehension about land conflicts in four of the five study zones, one sees significant variation across study zones in results for the two follow-up questions. Consistent with our initial hypotheses, the results from all three questions indicate a high-level of uncertainty about tenure security in Montepuez Nropa. On the other hand, the results for Monapo, an area hypothesized to be experiencing similar problems as Montepuez Nropa, are mixed. On one hand, 91 percent of Monapo respondents reported that land conflicts are a problem in their community. On the other hand, only 33 percent gave a definitive “yes” to both follow-up questions while 32 percent gave a definitive “no” to the question regarding smallholder apprehension about losing land. The responses to the follow-up questions indicate that although concerns about losing land are more serious in the Monapo zone than in the Corrane and CARE-OPEN zones, they are less serious than in Montepuez Southeast and Montepuez Nropa.

The results from the CARE-OPEN and Montepuez Southeast appear to confound our initial expectations. In Montepuez Southeast one finds a high degree of concern expressed in the

answers to all three questions; indeed, the level of concern is similar to what respondents in the Montepuez Nropa zone expressed. In CARE-OPEN, the zone for which we anticipated the fewest problems, 74 percent of the sample reported that land conflicts are a problem in their communities. At the same time, however, it is striking that this did not translate into a percentage of informants concerned about smallholders losing land in their communities (26 percent) or about the arrival of newcomers seeking land (18 percent).

While the following section on actual experiences with conflict will discuss in more detail differences across zones, we would call attention to two dynamics surrounding perceived problems related to tenure security. First, within study zones, there does not appear to be a significant correlation at the *village-level* between the answers to the question regarding land conflicts being a problem and actual experience with conflicts. That is, within study zones, one does not see villages that have more experiences with land conflict expressing significantly more concern about land conflicts in their communities than villages with fewer actual experiences of land conflicts. We would argue that while a village's actual experience with land conflict is important, smallholders in villages with few land conflicts may nevertheless be concerned about losing land in the future if neighboring villages are themselves experiencing land conflicts.

Second, while only six percent of the households in Montepuez Southeast were experiencing a conflict at the time of the survey (Table 5-2), we note that their tenure concerns are nearly as high as their counterparts in Montepuez Nropa where 27 percent of smallholders were experiencing conflicts at the time of the survey. These results are somewhat contradictory and we are not aware of a definitive explanation. We would suggest, however, that the available data indicates that the insecurity in Montepuez Southeast could derive from two factors. First, while the influx of non-natives is significantly lower than in the Montepuez Nropa zone, it is still higher than in the other three study zones. The arrival of these smallholders could be perceived as contributing to future land-related problems. Second, while households may not yet have had many actual conflicts, they are relatively near another area, Montepuez Nropa, where smallholders had experienced a high percentage of conflicts and where the same JVC, LOMACO, was operating. Individuals in Montepuez Southeast could simply be concerned that the problematic dynamics their neighbors were experiencing in Montepuez Nropa might spill over into their communities.

### **C. Smallholder Experiences with Land Disputes**

Smallholder perceptions about land tenure problems in their communities are rather alarming. In this section, we consider the extent to which smallholder experiences with land conflict correspond to their perceptions. To gain insight into this issue, we consider smallholder responses to several questions regarding their experience with land disputes in Table 5-3.

Respondents were asked whether they have experienced land disputes at any time in the past or if they are currently involved in a land-related dispute. Respondents who answered "yes" to either question were asked several further questions related to these experiences. These questions included:

- a. With whom did you experience this conflict? Three answers dominated the responses obtained regarding this question: (i) with another smallholder; (ii) a JVC; or (iii) a *privado*.
- b. Did you perceive that you were the owner of the parcel subject to dispute?
- c. Did the dispute concern (i) ownership; (ii) borders of the parcel; or (in Montepuez Nropa only) (iii) PUPI-related problems—defined as a disagreement with LOMACO concerning current or future rights to cultivate LOMACO-held blocks under PUPI contracting arrangements.
- d. Did the dispute end in your loss of use rights to the given parcel?
- e. In cases where you lost rights over parcels you believed you owned, did you receive compensation?

### **Households Experiencing Land Disputes: A Look Across Five Zones**

Table 5-2 indicates that across the sample, 23 percent of households reported having had a land dispute at some point; 61 percent of those having reported a conflict further stated that they were involved in a dispute that was still ongoing at the time of the survey. Of households that had ever experienced a land dispute, 65 percent reported that it was over a parcel that they considered their own. Of ongoing disputes, 71 percent concerned parcels considered to be owned by the smallholder. Although the figures on actual land disputes represent a much smaller proportion of households than the proportion that perceived land conflicts to be a problem in their community, the fact that nearly a quarter of the households have experienced conflicts helps to explain why so many households expressed concern about land tenure insecurity.

Looking across the study zones, we find significant variation both: (a) between study zones with respect to the incidence of land disputes; and (b) between villages within each study zone. A comparison of study zones is only partially consistent with our initial hypotheses predicated on key characteristics differentiating the zones.

Smallholders in Montepuez Nropa and Monapo, as we hypothesized, experienced disputes more frequently than the other zones (36 and 29 percent, respectively). Likewise, 27 percent of the Montepuez Nropa sample and 21 percent of the Monapo sample were involved in disputes at the time of the survey. The majority of all conflicts reported in these zones was over land that the informants perceived to be their own.

Table 5-2 highlights an important difference in terms of the nature of *current* disputes experienced by smallholders between the two Montepuez zones and Monapo. In Montepuez Nropa and Montepuez Southeast most disputes concerned parcel borders. Meanwhile, parcel ownership was the subject of dispute in nearly all (91 percent) cases in Monapo. Therefore, even though Montepuez Nropa households are more likely to experience land disputes than households in Monapo, we suggest that the nature of disputes is more intense in the latter where parcel ownership is at issue.

CARE-OPEN, on the other hand, has only eight percent of sampled households reporting current conflicts, much lower than in Montepuez Nropa and Monapo. The lower level of tenure

disputes in this zone with considerably less economic activity and agricultural investment is consistent with our expectations. Too, Corrane has almost no current conflicts (five percent of the sample); a possible explanation is that its relative isolation has meant much less private sector activity to date than in neighboring Monapo. An important issue for policy makers in the future will be the extent to which planned (and in some cases already realized) road improvements increase competition for land in zones such as Corrane and CARE-OPEN.

### **Households Losing Land**

Approximately two-fifths of all households who have ever had a dispute report having lost access to a parcel they perceived as their own. Whereas Montepuez Nropa ranked highest among the five zones in terms of incidence of a dispute, households in Monapo may have suffered the gravest consequences. Consider that 14 percent of Monapo households reported having lost access to one or more of their fields compared to only 8 percent in Montepuez Nropa and lower proportions elsewhere.

Tables 5-2 and 5-3 also include information regarding the question of with whom smallholders experience land disputes. Across the sample, fully one-half of reported disputes were with other smallholders whereas disputes with JVCs and *privados* were 34 percent and 16 percent, respectively. In the Monapo zone, SODAN and SAMO were responsible for the plurality of land disputes (45 percent) in the minds of smallholders. Yet in Montepuez Nropa, Corrane, and Montepuez Southeast, all zones marked by the presence of a JVC, the majority of land disputes were between individual smallholders. *Indeed, a key finding is that smallholder-smallholder disputes occur with considerable frequency, regardless of whether the zone has a JVC or a large number of privados present.*

### **Households Experiencing Land Disputes: Comparisons Within Zones**

Within each study zone, there is a great deal of heterogeneity between villages concerning the incidence of disputes. This within-zone heterogeneity helps to substantiate an argument within this report that no single variable or small set of variables fully explains why some villages experience more land disputes than others. The impact of the presence of a JVC is therefore likely to be mixed, and will often depend upon the particular historical dynamics surrounding block land in or near a community or perhaps the individuals acting on behalf of the JVCs and/or within the communities.

Indeed, many of the conflicts FSP and LTC researchers encountered during fieldwork derived from circumstances unique to particular communities. For example, 73 percent of all Picadane households (Monapo) reported being involved in a dispute at the time of the survey while 51 percent affirmed that they had lost at least one field. Meanwhile, three other villages in the Monapo set had a relatively low number of households that had experienced land disputes, none of which had lost land as a consequence. The key problem in Picadane, a Monapo study village, was that SODAN sent a bulldozer to the area in July 1995, between the third and fourth rounds of the five-round study. This bulldozer cleared land and felled cashew and other fruit trees considered by smallholders to be located on their own land. SODAN contended that their activities were on land allocated to it on its 11,000ha Meserpane property. This created

considerable confusion and tension in the community, and necessitated the intervention of District and Provincial Government officials.<sup>23</sup>

In Napipine, another village in the Monapo set, 49 percent of smallholders reported being involved with a dispute. Demonstrating the heterogeneity in terms of with whom conflicts are experienced by smallholders, in this village all smallholder conflicts were with a *privado*. Cesar Tique, in the course of his M.Sc. thesis research, also studied Napipine and learned illustrative details of the nature of the land conflict in Napipine. Tique quotes the District Agriculture Director from a 1995 interview:

Narciso Pinto, a Portuguese national who came here after the civil war ended in 1992 and Adventino Pinto Santos, who claims to have inherited his parents' land from the colonial period have occupied large areas here in Namialo and they are expanding their farms over the smallholder farms. Furthermore, Narciso has cut down 50 cashew trees that belong to the local population. These private farmers are pushing the local population to marginal areas as their landownership expands in the area. Now people have to walk for two or three hours to cultivate the land. (Tique 1996, p. 137)

Within Montepuez Nropa, 63 percent of disputes that smallholders reported were with other smallholders whereas 37 percent, slightly above the overall sample average, reported conflicts with LOMACO. Yet, there is also significant variation across villages within this study zone. Both Nropa and Nacuca villages, for example, had a relatively high percentage of conflicts. Yet, 92 percent of the "current disputes" in Nropa were with the JVC whereas 99 percent of the conflicts in Nacuca were with other smallholders. In another Nropa zone village, Mararange, 29 percent of land disputes were about PUPI-related issues. Specifically, in Mararange, LOMACO and smallholders had successful PUPI production results for three growing seasons (1991/92-1993/94) in both cotton and maize plots. Yet in 1994/95, PUPI-scheme participants experienced particularly poor results in their block maize plots, culminating in a dispute with LOMACO. Many of the farmers perceived that their poor maize results derived from factors beyond their control and attributed the cause to drought conditions and poor seed and poor sowing by LOMACO. When LOMACO, based on a different interpretation of the problem, decided to deduct costs for maize inputs when the farmers were selling their cotton, smallholders protested quite strongly. Because of this controversy, LOMACO chose not to continue the PUPI program in Mararange in the 1995/96 cropping season and denied use rights to smallholders that had been cultivating parcels on the PUPI block.

### **Households Experiencing Land Conflicts: Comparisons across Demographic Categories**

Table 5-4 attempts to identify relationships between the incidence of land disputes and basic household characteristics. For example, are households who experience disputes more or less likely to be native to a community, older or younger, female headed, have larger or smaller areas,

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<sup>23</sup> While the authors are aware that the Monapo District Administrator intervened in this matter on behalf of the Picadane smallholders, terms of how the conflict was resolved between SODAN and Picadane smallholders is not known to the authors.

produce cotton, have greater or fewer cashew trees, or have differential income levels? A general conclusion from Table 5-4 is that there is no observable variable that easily distinguishes households who have experienced a land dispute from those who have not. For example, in Montepuez Nropa households with land disputes have larger landholdings (1.7 v. 1.1ha per capita) while in Montepuez Other (0.9 v 1.0ha per capita), Monapo (1.3 v. 1.4ha per capita) and Corrane (1.2 v. 1.4ha per capita) the reverse is true. In CARE-OPEN both groups have 1.4ha per capita. Similarly, in Montepuez Nropa households with disputes have greater per capita income while in the Montepuez Other, Monapo and Corrane the reverse is true again.

Notwithstanding the conclusion of no observable differences between households who have had and who have not had land disputes on a wide range of variables, one potentially important exception concerns the distinction between native and non-native households. We would expect that non-natives to a community would be more likely than native households to experience disputes. In fact, we find that non-natives (28 percent) are more likely to have experienced a dispute than native households (20 percent), with this difference being statistically significant at the five percent probability level.

### **Testing CW 2—Fair and Equitable Dispute Resolution Mechanisms in the Traditional System**

CW 2 holds that to the extent that smallholders experience land conflicts with their neighbors, adequate mechanisms exist within traditional authorities to adjudicate these issues in a manner acceptable to community members involved in such disputes. To test CW 2, in Table 5-5 we consider answers respondents who reported having lost land they believed to be their own gave to the question: Did you receive compensation for your loss?<sup>24</sup>

Table 5-5 shows that among the 521 sampled households, a total of 37 incidents were reported in which households lost land they believed to be their own. More than one-half (20) of these conflicts were with other smallholders, about one-third (13) were with *privados* and only one-tenth (4) were with JVCs. It is striking that in none of the 20 smallholder:smallholder disputes did the losing party receive compensation; compensation was reported in seven of 13 smallholder:*privado* and one of four smallholder:JVC disputes.<sup>25</sup> These results tend to contradict CW 2 and suggest that when conflicts occur between smallholders, the dominant outcome is no compensation being received by the loser.<sup>26</sup>

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<sup>24</sup> No direct questions were included in the LTC survey instrument to probe smallholder attitudes concerning whether they felt that conflicts had been resolved fairly or justly. As such, we are limited to the question of compensation to evaluate CW 2.

<sup>25</sup> It should not necessarily be inferred that where compensation was received by smallholders for lost fields that they perceived this process to have compensated them fully or equitably. Because the survey only asked a yes/no question, we are limited in our analysis to the statements made in the text.

<sup>26</sup> Two methodological notes are important to interpretation of Table 5-5. First, the results are unweighted and should be interpreted simply as the number of incidents reported by the 521 households. Second, the incidence of conflicts reported in this table is considerably lower than the number reported in Tables 5-2 and 5-3. This is because

## D. Discussion

The survey data on smallholder perceptions of tenure security and their experiences with conflict in the Cotton Belt suggest six conclusions.

*First, across the entire Cotton Belt there appears to be considerable concern about land conflicts taking place in communities. A smaller, but still large percentage of smallholders expressed concern that smallholders in their communities could lose land. Given the importance of tenure security to long-term investments, these results are troubling. Hopefully the new legal framework with respect to land will help to remedy this problem.*

*Second, conflicts in villages appear to diminish the perceived tenure security of smallholders in neighboring villages that may not themselves be experiencing any conflicts. Indeed, the data demonstrates that it is not necessary for a large percentage of land conflicts to occur in a particular village for smallholders of that village to be concerned about their tenure security. A comparison of villages across and within zones indicates that while one sees variations across study zones, perceptions tend to be similar among villages in a particular study zone. This is true although some villages have had many more experiences of conflict than others in the same zone.*

*Third, in terms of actual experiences with land conflict, there is considerable variation across study zones as well as among villages within each study zone. These variations exist in terms of incidence of disputes, with whom disputes are experienced, the type of dispute, and the outcome of the dispute. We emphasize that the individual histories of each village and their experience with JVCs and *privados* is often unique and should discourage explanations rooted in one or two variables such as the presence of a JVC or the accessibility of the area. One result that stands out is the seriousness of disputes experienced in the Monapo region where 91 percent of disputes reported concerned parcel ownership. In the four other zones the majority of disputes were about parcel borders.*

*Fourth, while the data indicates that non-natives are statistically more vulnerable to land conflicts than natives, there are no other demographic variables across study zones that distinguish households who have experienced a land dispute from those who have not.*

*Fifth, the study demonstrates that while the presence of a JVC may indeed be associated with a greater number of land conflicts and a heightened sense of tenure insecurity (Montepuez Nropa and Monapo), this is not always the case. Indeed, Corrane and Montepuez Southeast have JVCs but had fewer conflicts than the CARE-OPEN zone where there was no JVC and relatively little agricultural commercialization.*

*Sixth, to the extent that JVCs or *privados* are associated with conflict, the causal mechanism is uncertain. In explaining the higher incidence of conflicts in Montepuez Nropa and Monapo, we would suggest two possible explanations. First, the data clearly indicate that in a significant*

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the earlier tables included all conflicts regardless of whether the respondent perceived ownership of the disputed parcel.



number of the conflicts, smallholders perceive that JVCs and *privados* are encroaching upon their land. These actions aggravate fears and, in some cases, dispossess smallholders of land they perceive to be their own.

At the same time, however, we argue that while JVCs may be associated with an increased number of conflicts, this may also be attributed to the fact that they introduce a more vibrant economic dynamic into areas that increases the demand for agricultural land, attracts non-native smallholders seeking to participate in outgrower schemes, and possibly contributes to land scarcity. This certainly appears to be the case of Montepuez Nropa. As noted in Section II, most cotton production in the Cotton Belt is done by smallholders themselves on their own dispersed plots through outgrower schemes encouraged by the JVCs. The figures indicating that a high proportion of the conflicts are between smallholders themselves suggests that the solution to such tenure difficulties may not be discouraging relationships between JVCs and smallholders. Indeed, the cause of land conflicts may not only be largeholders taking land; rather that a JVC may be strengthening the local economy and, as a result, attracting outsiders and increasing the demand for productive land may help explain a number of land conflicts. To the extent that this is true, provisions in the legal and regulatory framework that protect communities *from* investors are an important, but insufficient, step towards improving smallholder tenure security. Delimiting community lands for purposes of geographically separating smallholders from JVCs and *privados* may have little effect on diminishing the frequency of conflicts, especially if they are primarily between smallholders themselves.

## **VI. APPARENT INEQUALITIES WITHIN THE SMALLHOLDER SECTOR: A NEED FOR MORE RESEARCH**

In this section we analyze CW 3—the conventional wisdom of smallholder land abundance in Mozambique. One implication of CW 3, if accurate, is that there are few land access related constraints if the government chooses to encourage programs such as planting cashew trees or smallholder cotton production, both of which require smallholders to expand their areas of production. In addition to focusing upon improving the productivity of areas already under permanent or shifting cultivation, these programs are predicated on smallholders acquiring access to additional and presumably readily available land. It is assumed that land is available upon which smallholders can expand their operations.

At a central policy level, the assumption of relative land abundance has been one of the arguments used to question the need to redistribute to smallholders the sizable chunks of land that Portuguese settlers and larger companies had obtained in the colonial era. In the Cotton Belt, these landholdings correspond to the “block” areas referred to in this report. Following independence, these colonial holdings were usually converted into state farms. In the late-1980s when the government had concluded that the state farm approach had failed and adopted a more market-oriented economic orientation, the government privatized these holdings with little serious consideration of distributing the land in question to the smallholder sector (West and

Myers 1996). Indeed, in addition to assuming that larger-scale production tends to be more efficient, policymakers have tended to assume that smallholders have access to other lands of good quality and that these colonial holdings did not significantly compress smallholders onto smaller and less desirable parcels of land.

The conventional wisdom of land abundance implicitly assumes that land tenure dynamics within what has frequently been termed the “customary” or “traditional” sector are relatively equitable and undergirded by a set of norms and adjudicating procedures that are “natural,” “timeless,” and perceived by smallholders as legitimate. Indeed, the land law, the environment law, and the proposed forestry and wildlife law all speak of decentralizing power and authority over natural resources to local communities with virtually no attention to power dynamics within communities. *We emphasize that, in general, we support this decentralization.* Nevertheless, while it is important that the national legal framework provide protections to communities vis-à-vis outsiders, the findings already presented in this report on the nature of land conflicts demonstrate that dynamics within the smallholder sector can also be conflictual, even if the nature and level of the conflict is influenced by the presence of “outside” economic actors such as JVCs or *privados*.

Tables 6-1 and 6-2 (column on farm size per adult) document substantial inequality in the size of landholdings within the smallholder sector on both a household and per capita basis within each study zone and overall. In Table 6-2, we divide the sample in each study zone into quartiles based on total farm size per adult. Two clear patterns emerge. First, in each study zone, fully one-quarter of the population has access to a little more than one-half hectare per laborer in the household while on the other extreme one-quarter of the households in each zone own three to five times that amount. Second, key welfare indicators appear closely linked with farm size quartiles. For example, in Monapo income levels of households in the upper quartile of the land distribution have per capita incomes more than doubling their land-poor neighbors (\$77 v. \$38 per capita). In Montepuez Southeast the ratio of income between the fourth and first quartiles is even greater (\$82 v. \$26 per capita). Similarly, cereal and cotton production on a per capita basis are tightly linked to farm size quartiles.

Table 6-2 also displays mean levels of calorie availability per capita per day for three different seasons of the cropping year. While the correlation between calorie availability and farm size is somewhat weaker than with respect to income, we would note that in Monapo and Corrane statistically significant differences exist between the upper and lower quartiles during the January 1996 period—the “*epoca da fome*” or hunger season. This, combined with results based on these data from Rose et al. cited above suggest that calorie availability is significantly influenced by access to land.

The differential size of landholdings on a per capita basis suggests that land access is a serious constraint for some households and, as a result, they may not be able to participate in some agricultural programs. For example, a smallholder’s “decision” to not participate in a cashew planting program may not be a purely economic decision based on an estimate of investment returns, sunk costs, and the household’s capacity to mobilize credit. It might also be due to the fact that non-participating households simply do not have access to land upon which

they can plant cashew trees. If true, some programs may only be accessible to, and produce advantages for, a particular group within communities that has better access to land.

The critical question that remains, however, is how does one account for the differential size of landholdings? Marrule (1998) has suggested that “customary land tenure systems” and “local social hierarchies” are likely to be key determinants. Pitcher notes that many of the families with relatively larger landholdings in the communities where she conducted research in Monapo and Mecuburi Districts had ties to customary authority and/or Frelimo political structures. Many individual families had also acquired more land because of their involvement in the colonial *concentrações* schemes and have, through the years, managed to retain and pass on their larger landholdings to subsequent generations (Pitcher 1998, p. 136-138). Both authors, however, emphasize the need for additional research on the issue, especially given its implications for household welfare and the capacity of households to participate in different types of agricultural programs.

## VII. CONCLUSIONS AND RECOMMENDATIONS

The results from this study have been used to examine three pieces of conventional wisdom that have tended to dominate popular discourse and the perspectives of policy makers. The first has posited that land conflicts in the Cotton Belt are primarily due to largeholders seizing smallholders land. The land use rights of the latter must therefore be protected through, for example, community consultation in the titling process or community land delimitation or demarcation programs.

The results of this study clearly demonstrate that smallholders perceive their tenure security to be relatively weak. Four out of five respondents across the study sample reported that land conflicts were problems in their communities and nearly one-half expressed concern about losing land in the future. An analysis of smallholder experiences with conflicts demonstrates that JVCs and *privados* are an important source of the problem. Across the study zone, half of all smallholder conflicts were with either JVCs or *privados*. Clearly, safeguards for smallholders in the land law and regulations are critically needed.

At the same time, however, a finding that appears to challenge the conventional wisdom on the cause of most smallholder land conflicts is the fact that half of all reported smallholder conflicts were between smallholders themselves. Indeed, the study zone (CARE-OPEN) where no JVC was operating reported more conflicts than two of the zones marked by the presence of a JVC. To the extent that the presence of JVCs and a large number of *privados* are associated with a greater number of land conflicts and higher perceived tenure insecurity, we suggest this phenomenon is attributable to two factors. First, there are indeed conflicts between JVCs and *privados* with smallholders. Second, and perhaps more importantly, the presence of a JVC gives rise to an economic dynamic that increases the value and perhaps the scarcity of land within the smallholder sector. As a result, smallholders themselves become more involved in disputes with each other

Two additional pieces of conventional wisdom have posited that: (a) land is relatively abundant in Mozambique and does not offer a serious constraint to expanding production among smallholders; and (b) local communities tend to be relatively homogenous with land allocation mechanisms being relatively equitable and perceived as legitimate by all community members. While there is a clear need for more research on these issues, we note that the existing data indicates the existence of differential size of landholdings among smallholders within the Cotton Belt as well as in other parts of the country. If true, this challenges the conventional wisdom that local communities are relatively homogenous and not themselves laden with power imbalances that could limit the degree to which opportunities are perceived as equitable. Given that the land law, the environment law, and the proposed forestry and wildlife legislation state their intention to devolve more power and authority to local communities, it will be important to research these issues more carefully. In addition, given that some agricultural programs such as encouraging cashew reforestation are predicated on smallholders having access to additional land that they can clear, it will be important to determine whether or not land constraints will prevent some (and which types of) community members from participating in those schemes.

Based upon these conclusions, we offer the following recommendations:

1. It is important to move away from a perspective rooted in the assumption that largeholders and smallholders are inherently involved in a zero-sum struggle over land. While land conflicts between smallholders and largeholders has been and will continue to be a problem, this often depends upon characteristics of the region and, in particular, the behavior of different JVCs or *privados*.
2. While the government and certain civil society organizations should continue to concentrate on defending smallholders that are involved in conflicts with economically or powerful outsiders encroaching upon their land use rights, these organizations should also focus upon constructing new and mutually-beneficial relationships between local communities and potential investors. The civil society's National Land Campaign's fourth message articulates this theme quite effectively. *Article 27(3) of the recently approved land regulations permit local communities to establish such partnerships by effectively negotiating community land use rights with potential investors.* These partnerships will need to be negotiated with caution and with the assistance of outside actors within government or civil society. Yet, this represents a new and exciting opportunity that could allow local communities to view investment more positively and benefit more directly from land-based resources for which they have acquired full land use rights.
3. Current government and NGO efforts to delimit or demarcate community lands should be pursued on a pilot basis and with the objective of facilitating meaningful integration of smallholders and largeholder economic activities rather than their geographic separation. Some advocates of the community delimitation approach have viewed it as an opportunity to protect smallholders *from* larger investors. Yet the results from the Cotton Belt clearly demonstrate that even if one protects smallholders from larger companies, a more vibrant local economy will still give rise to conflicts within communities and among smallholders.

As such, delineating local communities *could* have little effect on perceived tenure security or the frequency of land conflicts.

4. Given that the new land regulations permit local communities to effectively negotiate community use rights with potential investors, community land delimitation's primary goal should be strengthening the evidentiary rights of local communities which they can thereupon rely to negotiate more meaningful partnerships with private investors.
5. Although this report has emphasized that a sizable proportion of land conflicts takes place between smallholders themselves, it is important to emphasize that a significant percentage are between smallholders and JVCs and other largeholders. Many of these largeholders have use rights that remain provisional. Significantly, Article 46 of the recently approved land regulations requires that these requests that remain "in the pipeline" be subject to the new land law and regulations. This will likely lead to the modification, if not cancellation, of many of these provisional use rights as they often correspond to areas currently occupied by smallholders. While this is an extremely positive development, the government needs to rapidly develop a procedure for dealing with the thousands of "concessions in the pipeline" (*em tramitação*) that were initiated under the former legal framework. The government should establish such procedures as soon as possible in collaboration with academics, Mozambican civil society, and the private sector.
6. With respect to the "largeholder" sector, it important to establish mechanisms that discourage the acquisition of land use rights by entities with little capacity or desire to actually execute their proposed agricultural activities. Safeguards need to be established to prevent largeholders from diminishing the rights of others. However, policies should be designed to encourage a mutuality of interests between largeholders and smallholders in structurally long-term and productive economic and social relationships. The greatest danger emanating from the "largeholder" sector is the thousands of applicants that have acquired provisional land use rights for speculative purposes. In addition to not providing any practical economic benefits to local communities, these individuals, given their provisional claims, often sow uncertainty in rural areas, thereby diminishing tenure security. The new regulations establish a higher and more reasonable land tax that effectively penalizes entities (many of whom that have requested thousands of hectares) that have acquired land use rights but which are not actually engaging in productive activity upon the land. It is critical that the government mount an effective tax collection system to discourage unproductive speculation while also generating revenue for the state.
7. The data clearly demonstrates that non-natives are attracted to areas if they perceive that the area has economic opportunities. This can contribute to land conflicts and tensions between native and non-native residents. More research is necessary to determine which groups, if any, tend to be advantaged or disadvantaged in these dynamics. Such research should also identify ways in which the government and/or civil society institutions can influence local land allocation and adjudication systems so that they are equitable for all community members.

8. It is frequently assumed that local-level tenure systems have their “own” ways of handling conflicts and that community members tend to perceive those adjudication mechanisms as fair and legitimate. The fact that only a small percentage of smallholders who lost land they perceived as their own to other smallholders received any compensation suggests that these local-level adjudication systems are not perfect. There is a need for understanding more precisely how these systems work and whether the government can introduce changes in these systems without adding yet another artificial and ill-functioning institutional layer on local communities.
9. There is still considerable debate on whether or not there exists differential size of landholdings among farmers in the smallholder sector. Some observers have criticized on methodological grounds the findings reported in this study concerning the relationship between land access and household welfare. Some have produced their own quantitative data based upon surveys in which smallholders declared the size of their areas. Others contend that the land area data that have produced the findings from both sets of studies may be inaccurate for some households, given that this variable was based on area declared by smallholders rather than through field measurements. This is a potential problem and can only be remedied through additional research in which, among other things, fields are actually measured. Marrule (1998) has already done research in Nampula Province and has produced findings consistent with the results cited above. There is nevertheless considerable need to examine these issues across a wider geographic spectrum both to further confirm these findings and, more importantly, to provide insights into why the size of landholdings may vary across smallholder households. This research will be important as communities assume more authority over land and natural resources. It will also be important in deciding how to pursue certain agricultural orientations such that opportunities among smallholders will be relatively equitable.
10. This study has revealed what appears to be a high degree of farm fragmentation. Given the amount of time lost in walking from one field to another, it is important to have a better understanding of why fields of individual households are so scattered. Is it the result of a scarcity of land near village centers, perhaps because of the presence of larger landholders? Is it simply an appropriate response from farmers that seek to cultivate a wide range of food and cash crops and therefore need access to a number of fields with different soil characteristics?

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**Table 2-1. Firms Supporting Smallholder Cotton Production in Nampula and Cabo Delgado Provinces, 1994-95**

	Joint Venture Companies			Private Firms	
	Lomaco-Montepuez	SODAN	SAMO	CINPOFIM	Eduardo Baptista Pinto
	Lonrho Mozambique Agro-Industrial Company	Sociedade de Desenvolvimento Algodoeira de Namialo	Sociedade Algodoeira de Monapo		
<b>International Firm</b>	Lonrho (United Kingdom)	Grupo Comercial Joao Ferreira dos Santos (Portugal)	Grupo Entrepuesto (Portugal)	CINPOFIM (Portugal)	Based in Mozambique
<b>Location of Cotton Processing Facilities</b>	Montepuez (Cabo Delgado) Mogovolas (Nampula)	Namialo (Nampula) Namapa (Nampula)	Monapo (Nampula)	Ribaue (Nampula)	Does not own gin
<b>Area of Influence</b>	Cabo Delgado districts of:  Ancuabe, Balama Montepuez, Namumo	Cabo Delgado district of:  Chiure  Nampula districts of:  Meconta, Monapo (Netia) Muecate, Nacaroa, Namapa	Nampula district of:  Monapo	Nampula districts of:  Lalaua, Mecuburi Nampula, Ribaue	Nampula district of:  Mecuburi (Muite)
<b>Crops Supported</b>	Cotton, Maize	Cotton	Cotton	Cotton	Cotton
<b>Participating Smallhol</b>	16,180	57,896	7,105	n.a.	n.a.
<b>Smallholder Seed Cotton Production (Block and Dispersed) (1993/94) in MT</b>	6,117	11,543	2,423	406	n.a.

Source: Strasberg (1997)

**Table 2-2. Population and Land Concession Characteristics of Six Sampled Districts**

<b>District</b>	<b>Population</b>	<b>Area</b>	<b>Population Density</b>	<b>Land Concession Requests as of 12/1995</b>	<b>Hectares Requested</b>	<b>Percentage of District Requested</b>
	-- persons --	-- hectares --	-- ha / person --	-- number --	-- number --	-- percent --
Montepuez	147,000	1,587,100	10.8	37	7,800	0.5%
Monapo	225,000	359,800	1.6	107	64,739	18.0%
Meconta	144,000	373,300	2.6	59	24,800	6.6%
Mecuburi	119,000	725,200	6.1	60	10,301	1.4%
Ribaue	131,000	628,100	4.8	71	43,690	7.0%
Namapa	207,000	567,100	2.7	31	3,571	0.6%

**Table 3-1. Number of Villages in FSP/LTC Study Zone  
by Smallholder Production Arrangement**

	JVC Area of Influence		No JVC	Total
	Lomaco	SODAN/SAMO	CARE-OPEN	
<b>Districts Studied</b>	Montepuez	Monapo Meconta	Mecuburi Namapa Ribaue	
<b>Cotton Production Systems Present</b>		-- villages --		
<b>Total Existing</b> <sup>1</sup>	30	95	12	137
<b>High-Input Block Exists</b>	5	--	--	5
<b>Selected</b>	4	--	--	4
<b>High-Input Dispersa Exists</b>	3	--	--	3
<b>Selected</b>	3	--	--	3
<b>Low-Input Block Exists</b>	--	47	--	47
<b>Selected</b>	--	5	--	5
<b>Only Dispersa Exists</b>	25	48	12	85
<b>Selected</b>	3	4	5	12
<b>Non-Cotton Growers Exist</b>	30	95	12	137
<b>Selected</b>	7	9	5	21
<b>Total Selected</b>	7	9	5	21

<sup>1</sup> Within Montepuez, Monapo and Meconta, this set of villages includes all those where the JVC purchased cotton from at least 20 cotton producers in 1992/93. Within CARE-OPEN, villages included are those where CARE implemented OPEN Project in 1994/95 in Mecuburi, Namapa and Ribaue.

**Table 3-2. Population and Sample Size by Study Zone and Cotton Production Category**

	<u>JVC Area of Influence</u>		<u>No JVC</u>	<b>Total</b>
	<u>Lomaco</u>	<u>SODAN/SAMO</u>	<u>CARE-OPEN</u>	
	--households--			
<b>Population Total</b>	16698	16266	6391	39355
<b>Population High-Input Block</b>	504	--	--	504
<b>Interviewed</b>	39	--	--	39
<b>Population High-Input Dispersed</b>	137	--	--	137
<b>Interviewed</b>	27	--	--	27
<b>Population Low-Input Block</b>	--	7346	--	7346
<b>Interviewed</b>	--	47	--	47
<b>Population Low-Input Dispersed</b>	5250	6709	2116	14075
<b>Interviewed</b>	78	86	48	212
<b>Population Non-Cotton Growers</b>	10807	2211	4275	17294
<b>Interviewed</b>	57	42	97	196
<b>Total Interviewed</b>	201	175	145	521

**Table 3-3. Categorization of 21 Study Villages into 5 Land Tenure Study Zones**

Original Study Zone	Land Tenure Study Zone	Village	JVC Presence	High-Input Scheme	Blocks In or Near Village	Road Access
<b>Montepuez</b>	<b>Montepuez Nropa</b>	Mararange	Lomaco	Yes	Yes	Good
		Nacuaia	Lomaco	Yes	Yes	Good
		Nacuca	Lomaco	Yes	Yes	Good
		Nropa	Lomaco	Yes	Yes	Good
	<b>Montepuez Southeast</b>	Nacimoja	Lomaco	No	No	Good
		25 Setembro	Lomaco	No	No	Good
		Linde	Lomaco	No	*	Good
<b>Monapo/Meconta</b>	<b>Monapo</b>	Mepine	SODAN	No	Yes	Good
		Natete	SODAN	No	Nearby	Good
		Napipine	SODAN	No	Yes	Good
		3 Fevereiro	SAMO	No	Nearby	Good
		Namacopa	SAMO	No	Nearby	Good
		Nacololo	SAMO	No	Yes	Good
		Picadane	SAMO	No	Yes	Good
	<b>Corrane</b>	Varrua	SODAN	No	Yes	Isolated
		Napita	SODAN	No	Yes	Isolated
		<b>CARE-OPEN</b>	<b>CARE-OPEN</b>	Namwali	None	No
Namina	None			No	No	Isolated
Ratane	No			No	Nearby	Isolated
Nametumula	No			No	No	Isolated
Jakoko	No			No	No	Isolated

\* Lomaco operated High-Input Block Scheme in Linde in 1993/94, but abandoned it in 1994/95 due to poor performance

**Table 4-1. Sample Size, Demographic and Farm Characteristics by Study Zone, 1995**

	Montepuez Nropa	Montepuez Southeast	Monapo	Corrane	CARE OPEN	Total
<b>Sample size (households)</b>	138	63	133	42	145	521
<b>Household size</b>						
<b>Resident members</b>	5.19	5.19	5.06	4.99	4.62	5.04
<b>Resident adults</b>	3.65	3.82	3.46	3.21	2.99	3.5
<b>Household head</b>						
<b>Age (years)</b>	41	39	39	46	38	40
<b>Education (years)</b>	2.1	1.9	2.2	1.7	2.3	2.1
<b>Native to village (%)</b>	29	72	75	90	90	72
<b>Of non-village natives, native to district (%)</b>	53	54	87	39	29	63
<b>Female (%)</b>	1	0	2	6	3	2
<b>HH was displaced during war</b>	12	7	7	95	27	16
<b>Farm characteristics</b>						
<b>Total area (ha)</b>	3.98	3.36	4.43	4.18	3.93	3.96
<b>Total area per adult (ha)</b>	1.29	0.94	1.37	1.41	1.44	1.25
<b>Area cultivated (ha)</b>	3.13	2.39	3.15	2.73	3.35	2.92
<b>Area cultivated per adult (ha)</b>	0.98	0.67	0.99	0.92	1.22	0.93
<b>HH cultivates food crops (%)</b>	100	100	100	100	100	100
<b>Food crops sold (% total production)</b>	19	8	7	5	11	9
<b>HH cultivates cotton (%)</b>	56	15	83	95	33	52
<b>Cotton production (mean, kgs)</b>	438	92	576	527	74	377
<b>Cashew trees (mean)</b>	2	5	38	27	21	20
<b>Cashew production (mean, kgs)</b>	0	1	53	47	50	26
<b>Net income</b>						
<b>per Household (\$)</b>	288	185	278	304	202	241
<b>per Capita (\$)</b>	64	40	58	65	48	52
<b>proportion from</b>						
<b>Food crops retained (%)</b>	56	66	45	51	59	55
<b>Food sales (%)</b>	6	5	3	2	7	5
<b>Cotton (%)</b>	17	4	21	25	6	14
<b>Cashew (%)</b>	0	0	5	3	6	2
<b>Livestock (%)</b>	2	3	6	5	6	4
<b>Labor sales and micro-enterprise (%)</b>	16	18	17	8	10	16
<b>Other</b>	3	4	3	6	6	4
<b>Calorie Availability (Kcal / capita / day)</b>						
<b>May 1995</b>	2049	1947	2246	2808	n.a.	2148
<b>September 1995</b>	2266	2326	2432	2768	n.a.	2394
<b>January 1996</b>	1551	1377	1650	2153	n.a.	1578

**Table 4-2. Age of Household Head by Household Size**

<b>Number of Resident Members</b>	<b>Age of Household Head</b>					<b>Total</b>
	< 25	25-34	35-44	45-54	>55	
	--number of sampled households--					
1		1	3	3	5	12
2	11	11	4	9	8	43
3	22	24	19	14	15	94
4	16	33	28	22	17	116
5	6	32	19	20	13	90
6	3	19	22	22	4	70
7	3	13	18	13	6	53
8	1	2	10	6	2	21
9		1	5	4	1	11
10		1		2	2	5
11				4		4
12			1	1		2
<b>Total</b>	62	137	129	120	73	521



**Table 4-3. Primary Reason for Migrating to Current Communities for Non-Natives**

<u>Reason for Migrating</u>	<u>Montepuez Nropa</u>	<u>Montepuez Southeast</u>	<u>Monapo</u>	<u>Corrane</u>	<u>CARE-OPEN</u>	<u>Total</u>
-- number of household heads --						
Obtain work	36	0	9	2	4	51
Obtain land	12	2	5	1	4	24
Security from war	18	1	1	1	2	23
Marriage	6	12	4	0	1	23
Aldeia comunal	21	2	0	0	0	23
Operacao producao	8	0	0	0	0	8
Other	5	4	0	0	0	9
<b>Total</b>	106	21	19	4	11	161

**Table 4-4. Cropping Patterns and Value of Crop Production by Study Zone, 1995**

	Montepuez Nropa	Montepuez Southeast	Monapo	Corrane	CARE OPEN	Total
<b>Crops grown</b>	-- percent of cultivated area in annual crops*--					
<b>% cultivated area w/ principal crop</b>						
<b>Maize</b>	43	41	32	22	23	34
<b>Manioc</b>	12	21	22	32	21	21
<b>Cotton</b>	17	5	29	30	9	17
<b>Sorghum</b>	17	15	8	2	23	13
<b>Beans</b>	7	4	7	4	3	5
<b>Rice</b>	2	7	1	1	2	3
<b>Oilseeds</b>	0	0	0	0	13	2
<b>Groundnuts</b>	3	7	2	8	6	5

\* Column sums each equal 100 percent. In computing these percentages, parcels were considered completely cropped in the parcel's "most important crop."

**Crop production**

<b>Gross value (\$/HH)</b>	\$234	\$106	\$236	\$265	\$128	\$181
<b>Gross value (\$/adult)</b>	\$71	\$30	\$71	\$87	\$47	\$55

**by crop**

-- percent of gross value of production --

<b>Maize</b>	38	27	13	11	19	20
<b>Manioc</b>	4	20	19	32	24	17
<b>Cotton</b>	30	14	39	32	9	29
<b>Sorghum</b>	9	15	6	1	16	9
<b>Beans</b>	8	7	15	13	6	11
<b>Rice</b>	2	8	0	1	3	2
<b>Oilseeds</b>	0	0	0	0	6	1
<b>Groundnuts</b>	7	10	2	6	9	5
<b>Cashew</b>	0	0	5	4	5	3
<b>Other</b>	3	0	2	1	4	4

**Table 4-5. Farm Fragmentation Characteristics by Study Zone, 1995**

	Montepuez Nropa	Montepuez Southeast	Monapo	Corrane	CARE OPEN	Total
<b>Number of fields</b>						
			-- fields --			
<b>1-2</b>	10	9	3	3	1	5
<b>3-4</b>	43	49	35	18	44	41
<b>5-7</b>	44	36	57	67	51	49
<b>8 or more</b>	3	6	5	12	5	5
<b>Correlation coefficient: farm size and number of fields</b>	0.57	0.66	0.41	0.40	0.43	0.46
<b>Average distance (minutes)</b>						
			-- percent of fields --			
<b>0-15</b>	3	0	29	33	35	18
<b>16-30</b>	10	3	35	42	37	22
<b>31-60</b>	70	75	31	21	24	47
<b>61 or more</b>	17	22	5	3	5	12

Table 4-6. Mode of Land Acquisition by Use by Zone, 1995

Zone	Land Use	Customary / Traditional			Block	
		Owned	Borrowed	Bought	JVC	Privado
-- percent of area --						
<b>Montepuez Nropa</b>						
	Food Crop	92	0	1	6	1
	Cotton	77	5	3	13	3
	Cashew	100	--	--	--	--
	Fallow	100	--	--	--	--
<b>Montepuez Southeast</b>						
	Food Crop	97	2	1	--	--
	Cotton	75	25	--	--	--
	Cashew	100	--	--	--	--
	Fallow	100	--	--	--	--
<b>Monapo</b>						
	Food Crop	84	6	--	8	2
	Cotton	51	9	--	39	1
	Cashew	98	2	--	--	--
	Fallow	100	--	--	--	--
<b>Corrane</b>						
	Food Crop	85	3	--	12	--
	Cotton	7	1	--	90	2
	Cashew	100	--	--	--	--
	Fallow	100	--	--	--	--
<b>CARE-OPEN</b>						
	Food Crop	99	--	--	--	1
	Cotton	97	--	--	--	3
	Cashew	100	--	--	--	--
	Fallow	100	--	--	--	--

**Table 4-7. Land Use in Smallholder Sector by Zone and Cotton Production Category, 1995**

Zone/Household Cotton Production Category	Total Area	Annual Crops		Fallow		Monocrop Cashew
		Food	Cotton	No Cashew	Cashew	
-- mean hectares / household --						
<b>Montepuez Nropa</b>	3.98	2.55	0.56	0.78	0.08	--
<b>High-Input Block</b>	5.64	2.97	2.27	0.30	0.03	--
<b>High-Input Dispersed</b>	6.29	3.58	2.15	0.55	--	--
<b>Low-Input Dispersed</b>	4.21	2.48	0.85	0.79	0.09	--
<b>No Cotton</b>	3.47	2.56	--	0.82	0.06	--
<b>Montepuez Southeast</b>	3.36	2.23	0.16	0.73	0.23	0.02
<b>Low-Input Dispersed</b>	5.03	2.60	1.05	1.17	0.11	0.11
<b>No Cotton</b>	3.06	2.16	--	0.65	0.25	--
<b>Monapo</b>	4.42	2.15	1.00	0.75	0.41	0.11
<b>Low-Input Block</b>	6.18	2.70	1.75	0.77	0.85	0.13
<b>Low-Input Dispersed</b>	3.81	1.88	0.88	0.69	0.23	0.12
<b>No Cotton</b>	3.15	2.00	--	0.90	0.19	0.05
<b>Corrane</b>	4.18	1.88	0.85	1.05	0.27	0.11
<b>Low-Input Block</b>	4.34	1.98	0.92	1.09	0.25	0.11
<b>Low-Input Dispersed</b>	3.75	1.46	0.67	0.78	0.63	0.21
<b>No Cotton</b>	1.96	0.96	--	0.91	--	0.09
<b>CARE-OPEN</b>	3.93	3.02	0.30	0.36	0.18	0.04
<b>Low-Input Dispersed</b>	3.86	2.53	0.90	0.38	0.06	--
<b>No Cotton</b>	3.96	3.26	--	0.35	0.23	0.07
<b>Total</b>	3.95	2.35	0.57	0.70	0.27	0.06

**Table 5-1. Smallholder Perceptions of Land Tenure Security Issues by Study Zone and Village, 1996**

			Perceptions of Land Tenure Issues						
Land Tenure Study Zone	District	Village	HH Producing Cotton	HH Cultivating Cotton in Bloco Field	Conflict Over Land Is A Problem in Your Community	Are Smallholders in Your Community Worried About Losing Land			Arrival of New Persons Seeking Land a Problem
			--percent--		--percent yes--	yes	no	do not know	--percent yes--
<b>Total</b>			52	17	83	48	32	20	47
<b>Montepuez</b>		<b>Zone Average</b>	56	4	93	81	6	13	67
<b>Nropa</b>	Montepuez	Mararange	44	3	100	83	0	17	94
	Montepuez	Nacuaia	78	0	89	83	0	17	72
	Montepuez	Nacuca	63	7	93	78	17	6	28
	Montepuez	Nropa	26	12	89	89	11	0	80
<b>Montepuez Southeast</b>		<b>Zone Average</b>	15	--	86	73	13	15	77
	Montepuez	Nacimoja	7	--	83	64	18	18	57
	Montepuez	25 Setembro	6	--	61	58	39	3	56
	Montepuez	Linde	26	--	100	85	0	15	100
<b>Monapo</b>		<b>Zone Average</b>	83	31	91	33	32	34	33
	Monapo	Mepine	96	57	92	50	40	10	86
	Monapo	Natete	78	0	100	0	50	50	28
	Meconta	Napipine	30	0	100	94	0	6	50
	Monapo	3 Fevereiro	96	0	100	0	64	36	0
	Monapo	Namacopa	96	57	61	23	57	20	60
	Monapo	Nacololo	82	76	93	23	3	74	0
	Monapo	Picadane	82	0	100	78	0	22	44
<b>Corrane</b>		<b>Zone Average</b>	95	87	28	7	88	6	13
	Meconta	Varrua	98	89	39	0	88	12	6
	Meconta	Napita	93	86	18	12	88	0	18
<b>CARE-OPEN</b>		<b>Zone Average</b>	33	0	74	26	60	14	18
	Ribaue	Namwali	28	0	75	56	33	11	16
	Mecuburi	Namina	33	0	85	19	69	13	6
	Mecuburi	Ratane	93	0	43	6	77	13	12
	Namapa	Nametumula	15	0	89	25	63	13	44
	Namapa	Jakoko	0	0	81	21	58	21	11

**Table 5-2. Smallholder Experience with Land Disputes by Study Zone and Village, 1996**

Land Tenure	Study Zone District	Village	Experience with Dispute		Of HHs with a Dispute			Current Dispute					
			Any	Current	Machamba Perceived as Mine		With			About		High-Input Block	
					Any	Current	Ever Lost	Smallholder	JVC	Privado	Ownership		Border
			-- percent hh --		-- percent --	Disputed Field	--percent of current disputes--						
<b>Total</b>			23	14	65	71	39	50	34	16	65	33	2
<b>Montepuez Nropa</b>	<b>Zone Average</b>		36	27	75	81	22	63	37	0	26	63	11
	Montepuez	Mararange	52	36	65	69	17	68	32	0	29	42	29
	Montepuez	Nacuaia	28	21	100	100	25	48	52	0	32	68	0
	Montepuez	Nacuca	25	24	96	100	24	99	1	0	23	77	0
	Montepuez	Nropa	39	27	38	52	33	8	92	0	16	84	0
<b>Montepuez Southeast</b>	<b>Zone Average</b>		14	6	79	83	50	100	0	0	17	83	--
	Montepuez	Nacimoja	23	0	65	0	65	--	--	--	--	--	--
	Montepuez	25 Setembro	3	1	100	100	33	100	0	0	0	100	--
	Montepuez	Linde	14	12	86	83	14	100	0	0	18	82	--
<b>Monapo</b>	<b>Zone Average</b>		29	21	62	62	48	31	45	24	91	9	--
	Monapo	Mepine	14	1	7	100	0	0	100	0	100	0	--
	Monapo	Natete	42	24	57	54	26	77	23	0	88	12	--
	Meconta	Napipine	49	49	59	59	59	16	0	84	100	0	--
	Monapo	3 Fevereiro	10	9	0	0	0	100	0	0	50	50	--
	Monapo	Namacopa	43	15	56	27	49	46	54	0	77	23	--
	Monapo	Nacololo	2	1	50	100	0	100	0	0	100	0	--
	Monapo	Picadane	73	73	100	90	70	10	80	10	100	0	--
<b>Corrane</b>	<b>Zone Average</b>		9	5	89	100	44	84	16	0	32	68	--
	Meconta	Varrua	17	9	100	111	47	84	16	0	32	68	--
	Meconta	Napita	1	0	0	0	0	--	--	--	--	--	--
<b>CARE-OPEN *</b>	<b>Zone Average</b>		20	8	40	50	25	64	--	36	82	18	--
	Ribaue	Namwali	34	19	26	53	0	50	--	50	100	0	--
	Mecuburi	Namina	19	0	21	0	21	--	--	--	--	--	--
	Mecuburi	Ratane	11	4	0	0	0	0	--	100	100	0	--
	Namapa	Nametumula	4	0	0	0	0	--	--	--	--	--	--
	Namapa	Jakoko	29	13	90	77	66	100	--	0	50	50	--

\* Within the CARE-OPEN zone, responses by smallholders concerning the party with whom they experienced

a land dispute related to Cinpofim or Eduardo Pinto have been classified as privado in this analysis.



**Table 5-3. Types of Current Smallholder Land Disputes by Type of Entity with which Dispute Experienced**

Land Tenure Study Zone	District	Village	Households w/ Current Ownership Dispute	Ownership Disputes			Households w/ Current Border Dispute	Border Disputes		
				Smallholder	JVC	Privado		Smallholder	JVC	Privado
			-- percent --	-- percent of ownership disputes --			-- percent --	-- percent of border disputes --		
<b>Total</b>			9	33	49	19	5	86	14	0
<b>Montepuez Nropa</b>		<b>Zone Average</b>	7	82	18	0	17	68	32	0
	Montepuez	Mararange	11	79	21	0	15	100	0	0
	Montepuez	Nacuaia	7	87	13	0	14	48	52	0
	Montepuez	Nacuca	6	98	2	0	19	100	0	0
	Montepuez	Nropa	4	50	50	0	22	0	100	0
<b>Montepuez</b>		<b>Zone Average</b>	1	100	0	0	5	100	0	0
<b>Southeast</b>	Montepuez	Nacimoja	0	--	--	--	0	--	--	--
	Montepuez	25 Setembro	0	--	--	--	1	100	0	0
	Montepuez	Linde	2	100	0	0	10	100	0	0
<b>Monapo</b>		<b>Zone Average</b>	19	23	59	18	2	100	0	0
	Monapo	Mepine	1	100	0	0	0	--	--	--
	Monapo	Natete	21	100	0	0	3	100	0	0
	Meconta	Napipine	49	16	0	84	0	--	--	--
	Monapo	3 Fevereiro	4	100	0	0	4	100	0	0
	Monapo	Namacopa	12	100	0	0	4	100	0	0
	Monapo	Nacololo	1	100	0	0	0	--	--	--
	Monapo	Picadane	73	5	90	5	0	--	--	--
<b>Corrane</b>		<b>Zone Average</b>	1	100	0	0	3	100	0	0
	Meconta	Varrua	3	100	0	0	6	100	0	0
	Meconta	Napita	0	--	--	--	0	--	--	--
<b>CARE-OPEN</b>		<b>Zone Average</b>	6	50	0	50	1	100	0	0
	Ribaue	Namwali	19	43	0	57	0	--	--	--
	Mecuburi	Namina	0	--	--	--	0	--	--	--
	Mecuburi	Ratane	4	0	0	100	0	--	--	--
	Namapa	Nametumula	0	--	--	--	0	--	--	--
	Namapa	Jakoko	6	100	0	0	6	100	0	0

**Table 5-4. Relationship Between Demographic, Agricultural Characteristics and Income by Zone and Incidence of Land Dispute**

	<u>Montepuez Nropa</u>		<u>Montepuez Southeast</u>		<u>Monapo</u>		<u>Corrane</u>		<u>CARE-OPEN</u>		<u>Overall</u>	
	<b>Experience with Land Dispute</b>											
	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
<b>Percent of population</b>	36	64	14	86	29	71	9	91	20	80	23	77
<i><b>Demographic characteristics</b></i>												
<b>Native to village (%)</b>	37	25	67	73	66	78	65	92	90	91	64	74
<b>HH ever displaced (%)</b>	13	11	17	5	12	5	57	99	34	25	17	16
<b>Age, household head (years)</b>	37	43	42	38	35	41	43	46	39	38	38	40
<b>Female headed (%)</b>	2	0	--	--	0	3	8	6	0	3	1	2
<i><b>Agricultural characteristics</b></i>												
<b>Farm size per adult (ha)</b>	1.7	1.1	0.9	1.0	1.3	1.4	1.2	1.4	1.4	1.4	1.3	1.2
<b>Produce cotton (%)</b>	46	62	25	14	82	84	100	94	24	35	56	51
<b>Cashew trees (mean)</b>	3	1	6	6	44	36	26	27	20	21	25	19
<b>Net income per capita (\$)</b>	68	58	39	45	56	66	64	68	48	47	50	58
<i><b>Calorie availability (Kcal/capit</b></i>												
<b>May 1995</b>	1800	2191	2232	1899	2539	2131	2657	2821	n.a.	n.a.	2300	2100
<b>September 1995</b>	2443	2168	2700	2264	2661	2342	3151	2730	n.a.	n.a.	2634	2323
<b>January 1996</b>	1457	1604	1506	1356	1620	1677	2123	2156	n.a.	n.a.	1572	1580

**Table 5-5. Compensation for Land Lost by Type of Conflict by Zone**

	Conflict With					
	Smallholder		Privado		JVC	
	Conflicts	Received Compensation	Conflicts	Received Compensation	Conflicts	Received Compensation
	-- number of incidents --					
<b>Montepuez Nropa</b>	2	0	1	0	2	1
<b>Montepuez Southeast</b>	10	0	0	0	0	0
<b>Monapo</b>	4	0	11	7	2	0
<b>Corrane</b>	0	0	1	0	0	0
<b>CARE-OPEN</b>	4	0	0	0	0	0
<b>Total</b>	20	0	13	7	4	1

**Table 6-1. Measures of Land Inequality per Household and Adult by Zone, 1995**

	Montepuez Nropa	Montepuez Southeast	Monapo	Corrane	CARE OPEN	Total
<b><i>Area cultivated per HH</i></b>						
Mean	3.13	2.39	3.16	2.74	3.35	2.92
Std. Dev	3.16	1.20	1.46	1.38	1.52	2.14
Coeff. Of Variation	1.01	0.50	0.46	0.50	0.45	0.73
Gini Coefficient	0.41	0.34	0.19	0.17	0.20	0.35
<b><i>Area cultivated per adult</i></b>						
Mean	0.98	0.67	0.99	0.92	1.22	0.93
Std. Dev	0.81	0.49	0.49	0.46	0.52	0.62
Coeff. Of Variation	0.83	0.73	0.49	0.50	0.43	0.67
Gini Coefficient	0.43	0.36	0.22	0.23	0.23	0.38
<b><i>Total area per HH</i></b>						
Mean	3.98	3.36	4.42	4.18	3.93	3.96
Std. Dev	3.33	1.65	2.12	2.35	1.79	2.42
Coeff. Of Variation	0.84	0.49	0.48	0.56	0.46	0.61
Gini Coefficient	0.40	0.37	0.21	0.26	0.21	0.32
<b><i>Total area per adult</i></b>						
Mean	1.29	0.94	1.37	1.41	1.44	1.25
Std. Dev	0.91	0.65	0.75	0.79	0.72	0.78
Coeff. Of Variation	0.71	0.69	0.55	0.56	0.50	0.62
Gini Coefficient	0.42	0.37	0.24	0.29	0.24	0.36

**Table 6-2. Relationship between Income, Calorie Availability and Total Farm Size by Zone and Area Quartiles, 1995**

Zone	Farm Size per Adult Quartile	Farm Size per Adult	Net Income	Crop Production			All Other Income	Calorie Availability		
				Cereal	Cotton	Cashew		May 1995	Sept 1995	Jan 1996
		-- hectares --	-- \$ per capita --	-- kg per capita --			-- \$ per capita --	-- kcal per capita per day--		
<b>Montepuez Nropa</b>										
	1	0.58	43	165	42	0	14	1963	1922	1476
	2	1.13	58	288	101	0	6	1812	2115	1614
	3	1.52	100	460	168	1	25	2651	2674	1690
	4	2.90	82	460	149	0	11	1906	2809	1499
<b>Montepuez Southeast</b>										
	1	0.58	26	88	2	0	5	2120	2452	1513
	2	0.80	32	104	5	0	5	1636	2388	1296
	3	1.08	44	148	17	0	7	2004	1927	1379
	4	1.93	82	203	128	1	13	2191	2507	1253
<b>Monapo</b>										
	1	0.58	38	114	37	3	13	2390	2371	1503
	2	1.00	59	149	102	7	14	1876	2788	1548
	3	1.46	56	206	84	8	12	2394	2339	1642
	4	2.27	77	228	208	16	10	2334	2231	1906
<b>Corrane</b>										
	1	0.56	40	86	63	1	6	1856	2363	1671
	2	0.91	63	132	112	4	16	2678	2975	2526
	3	1.40	72	142	128	19	9	2535	3205	2251
	4	2.73	82	233	148	3	8	4059	2488	2098
<b>CARE-OPEN</b>										
	1	0.71	30	100	8	8	6	n.a.	n.a.	n.a.
	2	1.11	47	154	17	13	9	n.a.	n.a.	n.a.
	3	1.55	50	186	24	11	6	n.a.	n.a.	n.a.
	4	2.43	62	206	28	10	12	n.a.	n.a.	n.a.

Figure 3-1. Sampled Portions of Montepuez District

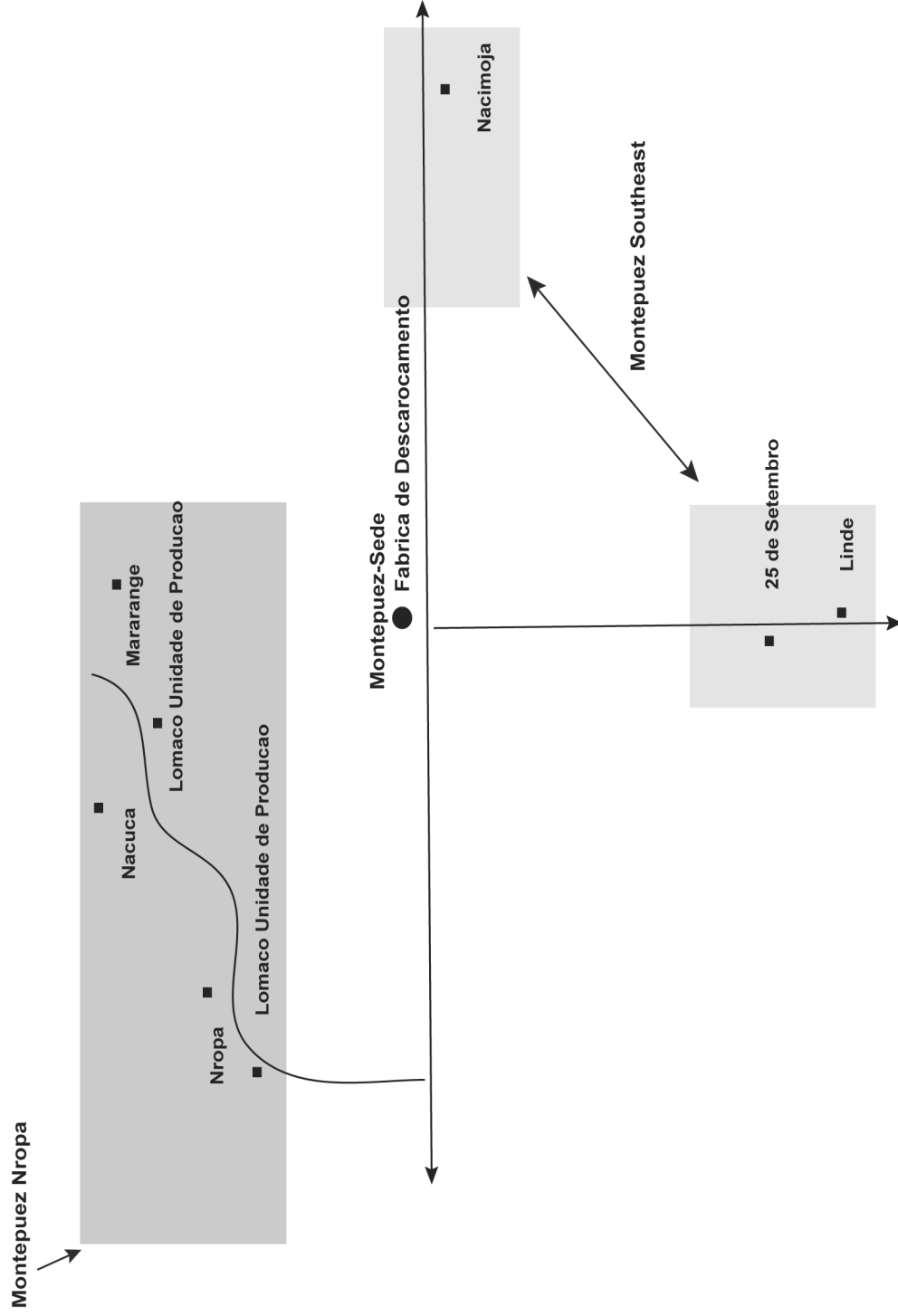
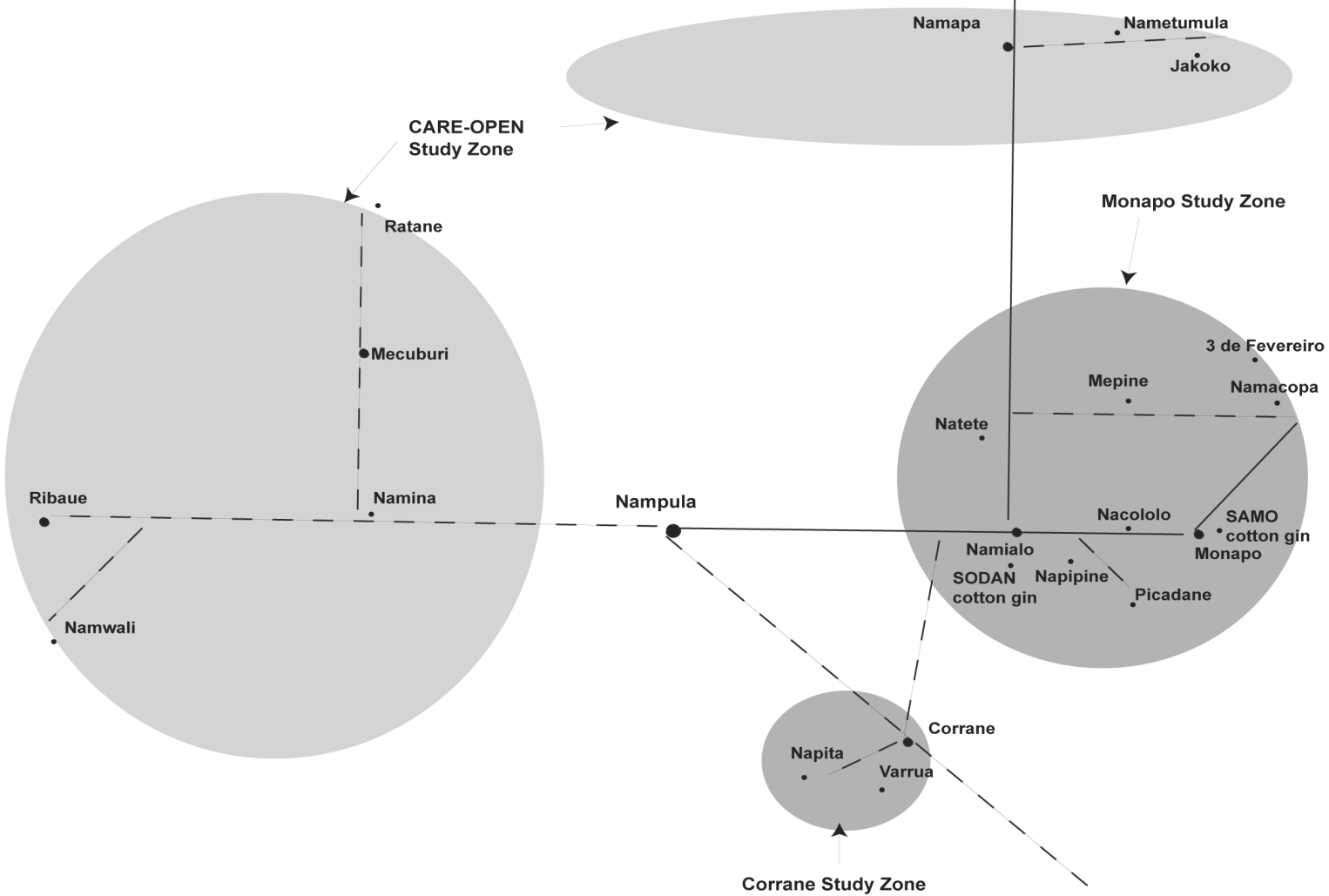


Figure 3-2. Nampula Study Zones and Village Locations



## Appendix 1. Population (households) and joint FSP/LTC sample by original study zone, Cotton production category and village

Village	Population	Sampled HHs	Pop block	Int block	Pop PUPI block	Int PUPI bock	Pop PUPI disp	Int PUPI disp	Pop disp	Int disp	Pop non-cult	Int non-cult
<b>Montepuez District</b>												
Mararange	1200	40	0	0	25	12	14	8	443	14	757	6
Nacuaia	208	21	0	0	0	0	3	3	160	11	45	7
Nacuca	1081	45	0	0	63	14	24	16	610	10	384	5
Nropa	534	32	0	0	63	13	0	0	77	12	394	7
Nacimoja	610	22	0	0	0	0	0	0	40	10	570	12
25 Setembro	420	19	0	0	0	0	0	0	25	9	395	10
Linde	908	22	0	0	0	0	0	0	217	12	691	10
SAMPLE FRAME	16698	201	0	0	504	39	137	27	5250	78	10807	57
<b>Sodan/Samo Area of Influence in Monapo and Meconta Districts</b>												
Mepine	163	20	93	12	0	0	0	0	64	5	6	3
Natete	83	18	0	0	0	0	0	0	63	10	20	8
Napipine	100	14	0	0	0	0	0	0	30	5	70	9
Varrua	133	21	117	14	0	0	0	0	13	6	3	1
Napita	132	21	113	10	0	0	0	0	10	7	9	4
3 de Fevereiro	225	26	0	0	0	0	0	0	215	22	10	4
Namacopa	251	22	142	7	0	0	0	0	96	11	13	4
Nacololo	285	19	216	4	0	0	0	0	18	9	51	6
Picadane	136	15	0	0	0	0	0	0	113	11	23	3
SAMPLE FRAME	16266	175	7346	47	0	0	0	0	6709	86	2211	42
<b>CARE-OPEN Project Districts: Ribaeu, Mecuburi, and Namapa</b>												
Namwali	503	32	0	0	0	0	0	0	150	9	353	23
Namina	1000	27	0	0	0	0	0	0	333	9	667	18
Ratane	123	28	0	0	0	0	0	0	110	26	13	2
Nametumula	600	27	0	0	0	0	0	0	70	4	530	23
Jakoko	437	31	0	0	0	0	0	0	0	0	437	31
SAMPLE FRAME	6391	145	0	0	0	0	0	0	2216	48	4275	97

Population within study zones are derived assuming the mean population of sample village equal to mean population of villages in sample frame. Likewise, population within each cotton production category or each study zone is assumed proportionate to results of proportions found within each cotton production category in each zone. In Montepuez and Monapo/Meconta, sample frame was limited to those villages with at least 20 households who sold cotton to a JVC in 1992/93. CARE-OPEN sample frame includes villages where CARE-Mozambique implemented OPEN in 1994/95.