OVERCOMING MARGINALIZATION IN THE BRAZILIAN AMAZON THROUGH COMMUNITY ASSOCIATION: CASE STUDIES OF FORESTS AND FISHERIES

REPORT

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EXECUTIVE SUMMARY

The role of community associations in marginalized communities is key in their social and economic development. This study presents a tool that helps in the formation and working of community associations in forest frontiers in the Amazon. The tool is a formal logging contract, using established forest management methods, that allows smallholders to access the forest resource on their 80 percent legal reserves.

This tool is a system by which both the community and sub-contracted logger can benefit. This tool is currently in use in communities of the INCRA settlements Moju I and Moju II located on the BR 163 highway near the town on Santarém in the State of Para. These settlements contain approximately 1,600 families, of which approximately 700 are in some form of negotiation with the logging company in question. The value of this tool is demonstrated by an ever-increasing demand by the community members and associations to work with the logging company. The logging company that has developed this tool has harvested annual volumes from 2001 to 2003 of 25,000, 35,000 and 43,000 cubic meters, respectively. Of which, approximately 60 percent comes directly from the community lots.

In effect, the community is subcontracting the logging company to develop forest management plans and harvest timber legally; a job that the smallholder is otherwise incapable of under the present conditions. But the project described here is much more than that, it begins with the discussion of forest management and the potential benefits to the smallholder, then aids in the formation of a community association, and goes through to the final disbursement of funds after the timber has been harvested. Even after harvest, the company is responsible for maintenance of the main roads.

The results of an empirical analysis of the tool clearly shows that those communities that had participated in the forest management project, and had seen harvest occur on their lands, judged their community association to be working well. However, families that had only heard about the tool (forest management), but had never seen it in action, or received the financial rewards, see their associations as ineffective and are uncertain about the benefits.

This bodes well for the replication of the tool, but with caveats. It is only after the harvest has occurred that the majority of community members will begin to believe in the project. Therefore it will be key to have a demonstration available, where community members can go and talk with other members and actually see forest management in action, and to quickly get past the first stages where uncertainly about the process and results generates confusion and distrust in the smallholders.

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1. INTRODUCTION

Migration to the Amazon frontier, both formal and informal, is incessant; families move deep into the forest with little support because land ownership is a powerful incentive. This is not the Sin Terra (Without Land) social movement; these are poor, individual, families searching for opportunity and willing to find it in what many would consider unbearable conditions.

The standard lot is 100 hectares (≈250 acres) and presents a chance for an otherwise destitute family. Poles and a tarpaulin are the first signs of residence; poor shelter in a foreboding forest. Axes and fire are the clearing instruments of choice - chainsaws are too expensive – and the battle for survival begins.

In the absence of government support (or perhaps in the face of intermittent support) and with little education and poor knowledge of the new environment, the families are marginalized from resource use decisions. They find themselves on a lot that is basically all forest, but know nothing of forest management and little of the potential for non-timber forest products. They understand clearing and planting manioc, corn, beans, and rice; they understand clearly the message given by illegal loggers 'R$ 100 for your tree' but beyond that, their horizon is limited. The full economic potential of the natural resources at hand is under-utilised – even with better knowledge, access to formal credit is limited, creating a formidable barrier to investment in mechanization and increasing productivity.

INCRA (the National Institute of Colonization and Agrarian Reform) is largely responsible for the homesteading of migrants on the burgeoning Amazon frontier. **Figure 1** shows an estimate for the number of families settled by INCRA from 1980 to 2000. There are many informal settlements above the number listed by INCRA, and often informal settlements, in which the lots are delineated by the individuals or communities, begin and are then formalized by INCRA.

In a formal settlement contract, INCRA has a set of obligations to the smallholder – it provides R$ 1,400 as start-up cash, a road, and a house. The cash is available quickly, but the road and house are often delayed. The house is estimated at R$ 3,100 and this money goes directly to a construction company who must then build a house on the lot.

INCRA give the smallholder a temporary title (called a Protocolo), which confirms the process of land titling is underway. The temporary title is sufficient for other government authorities to permit land use (ie, legal deforestation and forest management). It is unfortunately not sufficient for commercial banks to hold as collateral.

Figure 1.1. INCRA Estimates of Families Settled in the Amazon
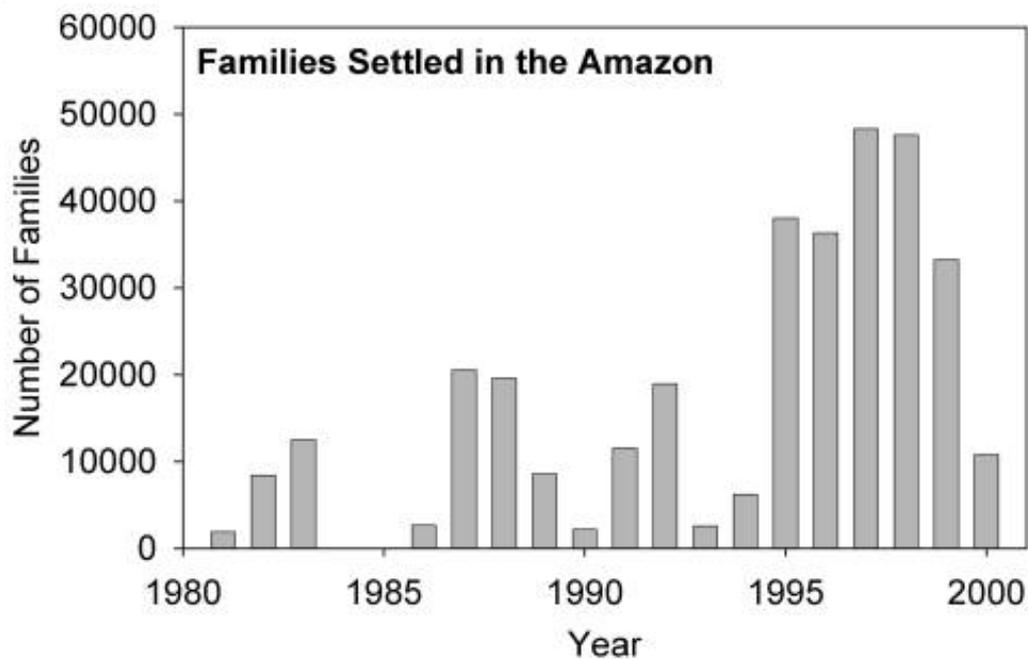
In this report we examine how some of these communities begin the process of taking control of decision-making. We assume that the formation of local level institutions (community associations) is the first step to improving control of resource use, and that an active and effective community association will provide otherwise scattered individuals with focused representation at local government levels. In addition, a cohesive community may benefit by capturing some economies of scale in, for example, investment of shared machinery or infrastructure.

In this document we describe a tool that is currently being used by communities in two INCRA settlements near the town of Santarém. This tool (essentially a formal harvest contract) has been developed by a logging company and successfully implemented in two communities; a total of approximately sixty families. The success of this program has generated spontaneous interest from another 600 families who are in various stages of contract negotiation. Fully 222 families have approved projects (approximately 200,000 m^3 at 900 m^3 per family) and are awaiting harvest.

This independent, market-based tool is changing the reality of community forestry in the Amazon from small isolated, integrated, and homogeneous groups to a dynamic system based on the massive migration and frontier settlement in the Amazon. These new communities are heterogeneous, spontaneous, and marginalized. Individual communities can range from a couple of families to more than 100, their only immediate connection being a mutual dependence for survival. The tool presented in this report acts as a catalyst to create and foment local level institutions, providing access to markets through better infrastructure, and speeding the process of de-marginalization.

Needless to say the tool is not without its problems. It has been in operation for less than four years and depends heavily on the actions of one individual logging company. Replication of this tool will require modifications to both company and community roles. The future logging companies will need to be supervised more heavily, and the communities must acquire a better understanding of operational requirements of forest management. In addition, there may be options for some value-added activity, or different contract options.

To provide contrast to this example, we examine a group of communities that one might consider to be traditional. The communities based on the floodplains of the Lower Amazon have been living in the region much longer than the new migrants, and in a different ecosystem, face different resource use decisions. The do however, from community associations to protect and administer the control of a natural resource. In this case, the resource is a fishery, and faces the problems of common resource management. Their tools are community based fishing accords, in which the management of either lake or river harvest is the desired objective. These accords work to varying degrees and we try to examine the characteristics that determine whether a community fishing accord is successful.

1.1. Research objectives

The objective of this research is to link the implementation of formal logging contracts (the tool) to the development of community (or local) institutions in a situation where the individuals are marginalized and the community members have little or no familial or social ties. We first describe the tool and then empirically estimate the influence of this project on community formation and household wealth. The formation of a community association and the subsequent access to health and education services that would begin the process of demarginalization must have certain drivers to start and substance to continue.

Here, we hope to identify some of the drivers and substance that determine community success. We examine 2 different types of community systems, migrant communities from on the Uplands (called *Terra Firme*), and more traditional communities on the Amazon River floodplain. Both communities are

located near the Amazon River town of Santarém in the Lower Amazon. The upland communities are located in two INCRA settlements (Moju I and Moju II) that in the Municipalities of Santarém, Belterra, and Placas. Access to local government support in these settlement projects is made more difficult by passing over Municipal boundaries – everyone is willing to say that they belong to someone else – but these communities have one powerful economic resource that may catalyse the process of development: timber.

In contrast, the floodplain communities have been in place longer, have stronger familial and social ties, but regardless, face complications in creating and sustaining associations that will help in the protection of natural resources and the demarginalization of the individual resource managers. The objective of this research is to provide a contrasting example of older communities and for a different resource. The "tools" in this case are fishing accords, and their effects on community cohesion and stock management.

1.3. Power tools for community development

Here we pose, and briefly answer, ten fundamental questions about the development of tools for the migrant groups excluded from natural resource (forest management) decision-making. We hope these questions and answers serve as an introduction to the idea and objectives of the report.

1. Who exactly is the marginalized group excluded from natural resource decision-making?

> In this instance the marginalized group are new settlers to forest frontiers in the Amazon.

2. What are the natural resource decisions or decision-making processes that they are excluded from?

> Due to a lack of information and infrastructure, the settlers have little decision-making ability over the forest resource at their disposition. They "control" on average 80 hectares of forest that can only be used for legal timber extraction with formal, approved, management plans.

3. How does this exclusion have negative effects on their lives?

> Along with the right to settle the lot, INCRA gives R$ 1,400 (approximately USD 470) as start-up cash to get through the first year; used in plating the first rotation of market crops. Forest management, depending upon the quality of the forest, can give the settler anywhere between R$ 8,000 to R$ 30,000, which will allow for intensification of

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agricultural production, investment in community schools and health, and other benefits.

4.   Why are the marginalized group excluded from those natural resource decisions or decision-making processes?

To develop management plans, smallholders must overcome the following, incomplete, list: knowing what forest management is; knowing the requirements of a forest management plan; fulfilling the requirements of said management plan (includes formal identification documents and land title). These are all massive hurdles to the smallholder.

5. What would need to change for the marginalized group to be included in those natural resource decisions or decision-making processes?

A start on the path to change would be the formation and strengthening of community associations. This process gives two important tools to the smallholder: bargaining power (the collected volume of timber is a negotiating tool for the group); and a voice in local government institutions (the community associations can join forces to become a large voting, or complaining, voice in local government offices).

6. How could the marginalised group bring about those changes? (What approach or approaches could they try?)

Forming association and the collective sale of timber is one way that the communities can bring about change. Ten percent of the revenue from individual timber sales can be allocated to the community association to even the distribution of benefits and to allow for investment in community infrastructure.

7. What tools would be useful sub-components of the approach?

The tool in question is a formal contract between the community association and a subcontracted logger. The individual smallholders choose whether to participate in the community association, and then he association chooses whether to negotiate with a logger. An example of a contract is posted in Annex I; this is an actual contract that has been used to formalize the harvest of timber from the community Terra Santa.

8. Which of these tools would be worth developing further?

The tool is currently in use in communities of INCRA settlements Moju I and II. The further refinement of this tool is a requirement. Required

improvements are: (1) training community members. For example, who from the community can oversee the correct application of the reduced impact logging? (2) Refinement of the options for the community. For example, are there value-added processing possibilities for some of the timber? Can the community invest in value-added processing to offset some infrastructure costs (ie, sawnwood for furniture and housing)? These should be considered on an individual basis, but an initial list of possibilities would be useful.

9. How would you go about developing and using the tool with the marginalized group?

The basic structure of this tool is complete, and described in this document. The implementation of the tool, however, presents another problem. The process would be as follows: (1) Identify communities that have potential to implement this tool. This will include the prerequisites of individual smallholders, forests, a logger, demand from industry, and positive forest rents. (2) Meet the presidents of the current community associations and begin the meeting process as described above. These could include taking community members and loggers to working examples of the tool and giving lectures in forest management to the communities.

10. How might the tool be useful to marginalized groups in other contexts?

This process strengthens local level organizations, generates stronger bargaining power through economies of scale, provides cash flow where access to formal credit is limited, and improves infrastructure to make other products more competitive. The replication of this tool, however, will depend upon the presence of the characteristics listed above. But modifications of this tool could make it more applicable to a wider variety of circumstances.

1.2. Report layout

To set the stage, we begin with a brief history of the forest sector in the Brazilian Amazon. This will provide with half of the participant settings; the loggers (Section 2). To provide the setting for our contrasting example, we then briefly describe the floodplain ecosystem and communities (Section 3). The next two sections (Sections 4 and 5) provide a review of the relevant literature, encompassing community forestry and local institutions. In Section 6 we present the fundamental steps of the tool that we can use to overcome some of the hardship faced by the smallholders in their search for economic development and de-marginalization from decision-making. In section 7 we present empirical

models that test the effectiveness of this tool and of older community organization tools from the floodplain. And finally, in section 8 we provide a conclusion and discussion.

2. FOREST SECTOR BACKGROUND

The development of the commercial forest sector in Brazil can be broken down into three distinct periods: The early production period which lasted from the 1950's to the early 1970's; the transition or boom period which lasted from the mid 1970's to the late 1980's; and the period of industry consolidation and harvest area expansion, which started in the early 1990's and continues today.

2.1. Early days (1950's to mid 1970's)

In the 1950's, the Islands' Region of the Amazon Delta in the State of Pará was the centre of the wood industry in the Amazon. Through the 1960's, there were three large plywood mills and six large sawmills that controlled production. With no connection to the large domestic markets of the Southeast and the dependence of fluvial transport, these mills produced only for the export market. Limited and irregular shipping capacity hindered sales to the Northeast of Brazil, which could only be reached by ship along the Atlantic coast. Small producers who sold logs along the banks of rivers supplied mills. The environmental impact of logging was minimal, as timber extraction was part of small scale family farming systems, which included logging during the high water season, and shifting cultivation and rubber tapping during the dry season. The two popular tree species harvested were Virola (*Virola surinamensis*) for plywood and Andiroba (*Carapa guianensis*) for sawnwood.

In the early and mid- 1970's, a number of smaller sawmills began to appear in the Island Region and further up along the Upper Amazon river. Into the mid 70's, the Amazon remained disconnected from domestic markets, but the export market flourished (Bruce 1976, Mercado 1980). Estimated log consumption was in the region of 2.5 million m^3 per year – all harvested by axe. Early reports on timber production in the Brazilian Amazon suggest this was a period of poor market access, poor quality of labourers, obsolete equipment, insufficient knowledge of local tree species, and poor cost accounting (Heinsdijk and Bastos 1963, Heinsdijk 1966, Knowles 1965, 1971).

2.2. Transition period (late 70's to early 1990's)

A period of dramatic transition began in the late 70's to early 1980s. Several highways were completed linking the Amazon to domestic Brazilian markets in both the Southeast and Northeast. Rondônia, Mato Grosso, and mainly Pará,

became connected through the Transamazon and Belém/Brasilia highways. Large public investment programmes for the construction of dams, hydropower plants, railroads for the Carajás mining programme and the settlement of migrants from the South and Northeast changed the face of the Amazon. Deforestation during this time was largely a response to government actions that either directly promoted or enabled land conversion from forests to other uses (Browder 1988, Binswanger 1991). The number and size of sawmills increased in response to the inexpensive primary resource and newly accessible markets, growing local demand and the availability of cheap labour. Mechanization of harvesting, transport and processing also contributed to the growth of sawnwood output.

By the early 1980's Paragominas became the most important milling center in the Amazon, producing mostly for the domestic market. The States of Rondônia and Mato Grosso also produced lumber for the domestic market, with important logging centres appearing in the towns of Sinop and Alta Floresta. Meanwhile, the Island region continued to produce for the export market. In all, the transition period during the 70's and mid to late 80's was a turning point in the timber industry of the Brazilian Amazon.

2.3. Consolidation and expansion (mid 1990's to 2000's)

After the transition period, another – less dramatic - period of consolidation and expansion ensued along old and new logging frontiers. Old frontiers can now be found in eastern Pará (Paragominas and Tailandia) and in northern Mato Grosso (Sinop). In these areas, virgin timber has become increasingly scarce, and the logging industry became more diverse and efficient. Marginal firms exited the market, and those that remained became vertically integrated in an effort to capture value added in downstream processing.

Access to the old frontiers is generally good given the high density of paved roads. The new frontiers are characterized by a rapid inflow of mills and producers from the old frontier. Government regulation is infrequent and access is limited here, as roads are often impassable during the wet season. The notable new logging frontier is in western Pará along the Santarém-Cuiaba Highway, BR-163 (Nepstad et al. 2001, Nepstad et al. 2002).

The current log volume produced in the Legal Amazon is approximately 24.5 million m^3 (IBAMA 2002)[1], 86 percent of which is sold in the domestic Brazilian market (Sobral et al. 2002). Two important alternate sources of raw material for

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[1] The difficult conditions of the Amazon frontier–illegal logging, poor communication, and vast distances–make estimating log production difficult. That said, estimates have been produced for the years 1998: 28 million m^3 (Smeraldi and Veríssimo 1999); 1999: 24.1 million m^3 (IBAMA 2002); and 2000: 24.5 million m^3 (IBAMA 2002).

the industry are now legal deforestation on small land holding and some illegal logging on both public and private land[2].

3. THE FLOODPLAIN ECOSYSTEMS AND COMMUNITIES

3.1. *Introduction*

The floodplain of the Amazon River Basin is a dynamic and complex ecosystem. It comprises the area of about 300,000 km2 that is periodically inundated by the lateral overflow of the Amazon River. Throughout the floodplain, islands form from the sedimentation of rich alluvial soils originating from the Andes and Andean zone. High water can see islands holding lakes 2 to 10 meters deep, formed by the entrapment of water within the natural levees of higher ground at the edge of the islands. These levees support forests and agriculture, and are focal areas for human settlements on the floodplain (Moran 1989). The infusion of nutrients from the river and their ability to support large fish populations makes the lakes important in the productivity of the floodplain (Goulding 1980, Sioli 1984, McGrath et al. 1993, Irion et al. 1995, Furch 1997, Junk 1997).

As the water retreats, a sediment-rich lakebed is uncovered exposing natural grasslands used for the grazing of cattle and water buffalo (Goulding et al. 1996). The grasslands are considered common property, with land boundaries based only on river frontage, extending back to the retreating lake edge. This transition between lake and grassland systems makes the floodplain environment a rich and diverse ecosystem (e.g. Salo et al. 1986, Foster 1990, Gentry and Terborgh 1990, Worbes 1997, Kvist and Nebel 2001, Nebel 2001). The richness of the system is reflected in the complexity of the floodplain farm systems, which in addition to cattle include fishing, market and subsistence gardens, and forestry.

These systems therefore include two common property resource management issues: pasture and fishing. The communal management of these two resources in conjunction with production of agricultural crops in a variable production cycle (water levels determine planting times and poor timing can be disastrous) create a complex community management scenario.

Cattle production and the use of the communal pasture resource during the dry season is somewhat constrained by capital (cattle are expensive) and the ability to house the animals during the wet season. The options for cattle management in the wet season are either rent pasture off the floodplains, or house the animals in a raised corral (called a maromba) and feed them by cutting and carrying grass to

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[2] The volume of illegal logging remains difficult to measure, but is still apparent as a source of raw material for the industry.

them throughout the wet season. Both of these alternatives have serious drawbacks. First, in addition to being expensive, the owners of dry land have an incentive to overstock and so the animals receive poor nutrition. In the maromba system the owner is obliged to cut-and-carry the grass everyday, a task that can take up to 4 hours a day, and is often conducted in waist or chest-high water (Merry et al. in press). Regardless of these drawbacks, cattle management is the most common land use on the floodplains and yet there are no, or few, community management agreements to control and protect the resource.

Fisheries on the other hand are becoming an ever-increasing part of the economic alternatives for community members on the foodplain (McGrath et al. 1993). The fishery was also an open access resource in which anyone, regardless of association, was able to access the resource. This has changed as fish stocks decline. In some lakes, communities have implemented accords that control access to the fishery. River control, however, is limited. In this report we examine the individual perceptions of these accords in communities located in the Lower Amazon. A survey was applied to these communities in 2000 by a team of researchers from IPAM. Preliminary results were used in Almeida (2003) and for a community information booklet. We now use this data to examine the perception of community fishing accords.

Figure 1. Location of the Lower Amazon study region
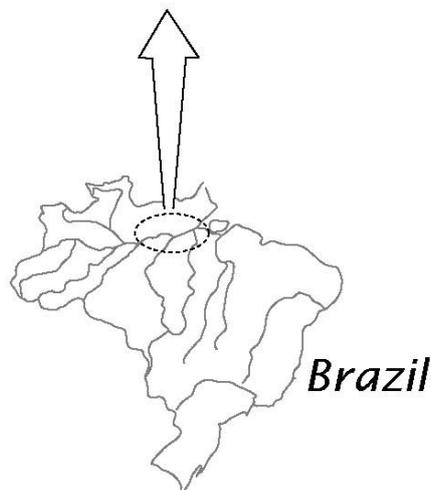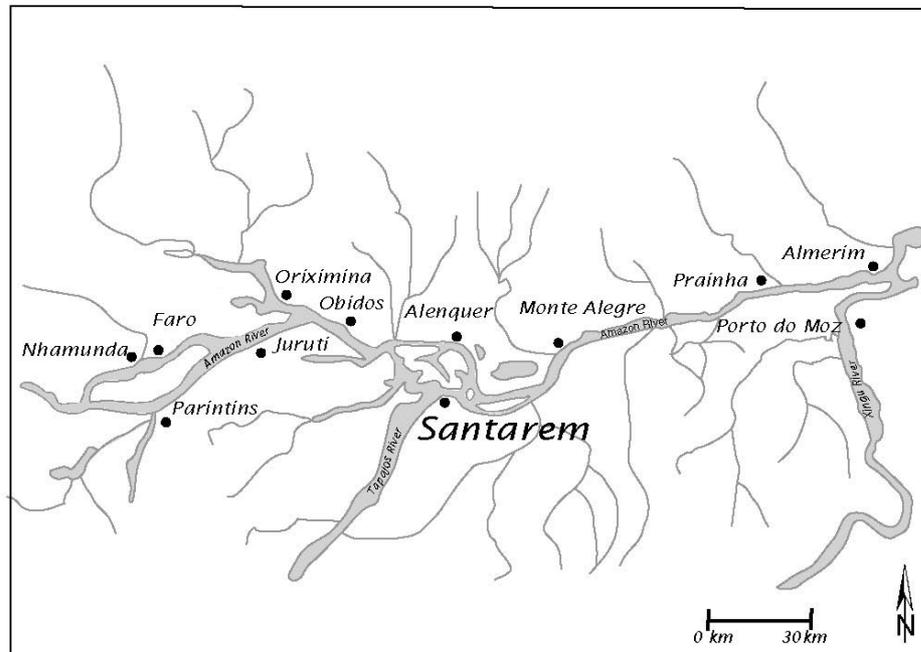
Source: Sheikh 2002.

4. COMMUNITY FORESTRY

4.1. Introduction

Community forestry in the Amazon is traditionally seen from one perspective: the management of common resources by a small homogeneous group whose livelihood is intricately, and in some cases uniquely, tied to the forest resource. The definition of the group itself, however, is arbitrary and ranges from indigenous groups to a newly registered association of neighbours. The thread is common property and the collective dominion and management of a forested area. This concept is attractive because in theory it captures the essence of development—increased value-added processing, autonomous decisions in resource use, and harmonious collective action. The practice, however, brings a different reality; community forestry is a vibrant and varied concept, changing between and during individual experiences and the future lies in acknowledging and embracing change (Kant 2000).

Although the image of an integrated community is attractive, it is the exception rather than the rule in the Brazilian Amazon. On the other hand, smallholders control vast areas of forest and form communities for mutual benefit. Community members are heterogeneous and familial ties largely not apparent in the first generation. Many of the individual practice forestry of some form - certainly all participate in the legal deforestation of up to three hectares or 60 m3 per year. But what of the 80 percent of the lot that must be left in legal reserve, available only with an approved forest management plan.

This area is currently the domain of illegal loggers who exploit their information and market advantages – they know the price of timber and are often a single buyer in the market. In many cases their offers can seem attractive to the smallholder. For example, they may offer R$100 per tree to the smallholder, which is an attractive price. But the logger will harvest only highest-grade species (ie, Ipê *Tabebuia* spp., Maçaranduba *Manilkara* spp.) which bring a log price of anywhere between 150 to 300 Reias per cubic meter – which, using a conservative estimate of 5 m3 per tree (Holmes et al. 1999), would bring anywhere from 600 to 1,500 R$ per tree. Even accounting for harvest costs, which do not include any costs of registration, road building, or planning, this will bring attractive profit to the illegal logger.

If this is to change and communities at the frontier are to control their forest resource, the perception of community forestry and of forest management itself must change. Consider community forestry; assume there are frontier families that form a community and who through settlement establish individual ownership over a contiguous, or not, forest resource. At the present time, These families are now not considered to be able to participate in community forest

management because their ownership is individual. From the current, limited, perspective of best forest management practices for the Amazon, which presupposes that there must be large undisturbed, contiguous tracts of land in which to conduct forest management, neither are they able to participate in this activity. This thinking is entirely incorrect. These families have formed communities and can benefit from the economies of scale that joint negotiations with logging subcontractors could bring. As far as forest management is concerned, it can be done on any area, regardless of scale (d'Oliveira et al. 1998, Pinedo-Vaquez et al. 2001); conservation benefits also come regardless of scale (Jantzi et al. 1999).

Imagine, for example, that you own a tropical forest of ten hectares (twenty five acres); you inventory that forest and find that there are ten trees of commercial value suitable for legal harvest. You identify these tress and harvest them using directional felling and extract them under the guidelines of RIL (see section 7.4). You then leave that forest for 25 or 30 years, at which time you renter to examine whether there are any other trees of commercial value – having completed a 100 percent inventory for the first harvest, you will have identified species of the second diameter class that are likely to move into the commercial class and so this task should be relatively simple. You then harvest those trees and proceed to wait another 30 years. This is forest management; it is irrespective of scale and activities on neighbouring land. You could be surrounded by soy farms and continue to practice forest management. Although this concept is self evident, it continues to be contested. Surely it would be better to have included many smallholders practicing forest management (as is common throughout the rest of the world) than it be the exclusive domain of large companies that can afford large tracts of land. That is not to say that smallholders should be the only managers of forest, the point is that forest management should not be constrained by scale; both large and small systems should compete to supply the market demand.

It is this idea that we offer as a tool for the management of frontier forests. It is also common practice, although mostly illegal and at different scales, throughout the Amazon. For example, many small and medium scale milling enterprises rent or buy land at to supply their mills. In many cases they are able to secure land for not more than two or three years supply (approximately 1,000 to 4,000 hectares are common).

Groups that develop from within the community are thought to be more effective than those mandated by outside influence (Chakraborty 2001); the interaction between the timber subcontractor and the community association can be viewed in that context. Although the subcontractor presents the idea, the decision to adopt forest management is taken by the association. It is important to note, however, that the interaction between community and industry must be carefully

monitored, because there is potential for the social and environmental considerations to be neglected when timber harvest is underway (Gauld 2000), and in some cases, community forestry remains subject to the incentives for illegal logging (Klooster 2001)

4.2 Devolution of control

We are gradually acknowledging the latent potential of self-governance and development in community and local institutions (Donnelly-Roark 2001, Heltberg 2001, Becker 2003).   The role of local institutions is described below in Section 6.   But, in a competitive market - global or local - a producer surplus attracts entrants; if the community becomes successful, there will be others who copy, improve, and compete. The community is often not trained to face a diverse and competitive market and if the community is less efficient at processing than new entrants, their marginal costs will be higher than the competitors, and they will be forced out of the market. Although the support of NGOs to these projects can be successful (Rosyadi et al. in press) it may provide a subsidy to production that is often overlooked when assessing a community's competitiveness.   Indeed, Gerbremedhin et al. (2003) suggest that collective action is more effective when managed at a local level and when it is demand driven rather than imposed from outside sources. If this is the case, these projects will likely end in the production halting after the NGO is unable to continue support.   In many cases, NGO projects have a definite lifetime; donor discount rates are moderately high and projects rarely run more than four or five years.

4.3 Cooperative management of private resources

It is possible that community groups can reduce use of common property resources but is a time consuming and complex process (Edmonds 2002).   But what of the management of community forests that are based on private lands? This owes more to the concept of cooperatives and the capture of economies of scale in a competitive market that can be captured by negotiation and sale in bulk.

This is the new reality of community forestry in the Amazon. The management of a common resource in forestry will be limited to Indigenous areas and State lands that are largely uncontrolled.   The formation of common resource management institutions for these areas requires a different set of rules and norms from those for cooperative management and sale of a resource.

In cooperative management individuals hold simple profit maximizing goals and their extraction of goods the resource (forest) in no way affects the wealth and well-being of the other members of the group.   The only exception to this is collective agreement to contribute part of the individual's income from harvest to a common fund.   This alternative provides an income-smoothing effect in

situations when the benefits come to individuals in large, random, amounts. The random nature of the income can be mitigated through collective decisions based on needs and in conjunction with sub-contractor planning (ie, it is more cost effective to harvest contiguous lots).

5. LOCAL INSTITUTIONS

5.1. Introduction

In this section we review some of the issues of local institutions in development and their relevance to the tool described in this document. Institutions, following North (1990) are defined as a set of rules and norms that determine the course of individual or group action. Heltberg (2001) further defines these for natural resource management to rules governing access (resource flow) and conservation (resource stock). It is becoming more obvious that effective policy decisions must consider the social and institutional context in which they are to be applied (Grootaert and Narayan 2001, Perz 2002)

5.2. Collective action and local institutions for common resource management

Much of the work in collective action focuses on the use of common resources, in either open access or common property situations. Private property or state ownership present different conditions and thus the household models described below are often more appropriate. The definition of these different aspects of resources, however, is important in the discussion of resource use. Open access resources are those described by a complete lack of control and are subject to overuse. Common property resources and usually controlled by a defined group and access is based on rules defined by said group. The degree of regulation depends largely upon the decisions made by the group and a variety of factors may influence the degree of regulation or use. It may be that a weak or inefficient group will allow open access to the common property resource. Private and State property are differentiated from the commons (open access and common property) by the presence of specific ownership and the control rules associated with individual ownership. Where State control is less than efficient, access to the resource may be opened, and individuals may be encouraged to claim ownership. This is the case for both short-term access to state resources (ie, illegal logging) or longer-term changes in ownership definition (ie, squatting). Both of these are apparent on the Amazon frontier.

Many failures of collective action can be attributed to the incentives for free rider action. The question of free-riders—those who benefit from but do not participate in collective action—is also relevant to the smallholder communities of the Amazon; individuals may choose to not participate in the association and thus

forest management agreements, but stand to benefit greatly from roads built within the community. Illegal loggers are also beneficiaries, although not strictly free riders to community forestry programs, as their access to timber stands—either government land beyond the communities (Terra Devoluta), or individual smallholder lots—is made easier.

There is the suggestion that collective action and common resource management in rural areas of developing countries can overcome the difficulties of free rider or common property management (Nugent 1993). The reasons being that rural groups are often more homogeneous and have less difficulty in communication due to family ties. In the case of heterogeneous community development on a migratory frontier, it may then be expected that cooperation is delayed or difficult. Research has shown, however, that under the right conditions the change from noncooperation to cooperation can occur quickly (Varughese and Ostrom 2001) and that heterogeneity does not uniformly depress community organization and self-organization. However, the general complex nature of community governance, coupled with differing, and sometimes obstructive ideologies from outside or within the group, can hinder the effective local management of resources (Tomich et al. 1998, Dhesi 2000, Kull 2002). That said, it is also apparent that mutually beneficial activity can be successful and overcome conflicting goals from outside sources (Ligon and Narain 1999, Uphoff and Wijayaratna 2000)

There is, however, now general agreement on the conditions under which self-organization and effective local institutions are likely. The list is divided between attribute of the resource and attribute of the users (Sekher 2001) and follows here from Ostrom (1999 pg. 3). The relevant attributes of the resource are: (1) it is not damaged beyond recovery; (2) there is information available about the resource; (3) the resource availability is predictable; and (4) the determination, establishment, and maintenance of boundaries are possible. The relevant attributes of the users are: (1) the level of dependence on the resource; (2) The level of shared understanding of the resource among the user group; (3) the users have a low discount rate and so are willing to value future income; (4) the elite are also affected by the use of the resource; (5) there is an established level of trust among users; (6) there is autonomy in user decisions ie, there is no contradiction by the State; and (7) there is some degree of prior organizational skills.

5.3 Gender issues in local institutions

Although not specifically considered in this report it is important to acknowledge that the participation of women in local institutions has shown to be beneficial to the care maintenance of local resources (Zwarteveen and Meizen-Dick 2001, Quisumbing et al. 2001). Yet it remains clear that concern over equitable access

to resource use by female users is valid; women's access to resources is usually poorer than men's (Locke 1999, Agarwal 2000, Agarwal 2001).

6. EMPOWERMENT TOOLS: A NEW MODEL OF COMMUNITY FORESTRY

6.1. Introduction

In this chapter we identify and describe a tool in use between a timber harvest operation and settlement communities. This tool is a system by which both the community and sub-contracted logger can benefit. This tool is currently in use in communities of the INCRA settlements Moju I and Moju II (**Figures 2 & 3**). These settlements contain approximately 1,600 families, of which approximately 700 are in some form of negotiation with the logging company in question. The value of this tool is demonstrated by an ever-increasing demand by the community members and associations to work with the logging company. The logging company that has developed this tool has harvested annual volumes from 2001 to 2003 of 25,000, 35,000 and 43,000 cubic meters, respectively. Of which, approximately 60 percent comes directly from the community lots.

Each lot is approximately 100 hectares, 20 percent of which can be deforested legally, and, if the colonist has a forest management plan, he/she is able to harvest timber from the remaining 80 hectares of "legal reserve". In this document we describe a tool for forest management that may provide a simple an effective means of allowing forest management in smallholder systems and link that process to the development and security of community association. This process works in the absence of government or donor funding.   It is based on a commercial agreement between loggers and community association; it is the very absence of external support that increases its likelihood of sustainability.

6.2. Description of the MAFLOPS program

So, the 'tool' in question is a formal logging contract between smallholders on the frontier and a logging company. In effect, the community is subcontracting the logging company to develop forest management plans and harvest timber legally; a job that the smallholder is otherwise incapable of under the present conditions. But the project described here is much more than that, it begins with the discussion of forest management and the potential benefits to the smallholder, then aids in the formation of a community association, and goes through to the final disbursement of funds after the timber has been harvested. Even after harvest, the company is responsible for maintenance of the main roads.

Figure 6.1. Location of the INCRA settlements of Moju I and Moju II.
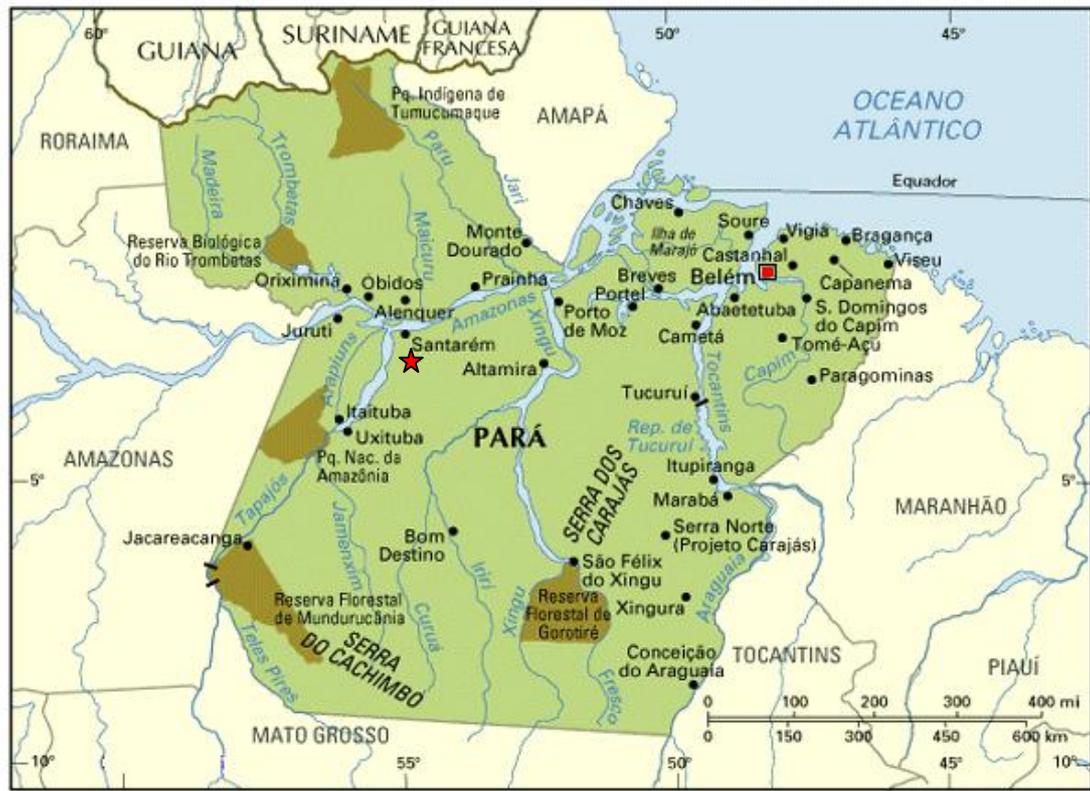
Figure 6.2. **Settlement map for forest management planning made by MAFLOPS**.
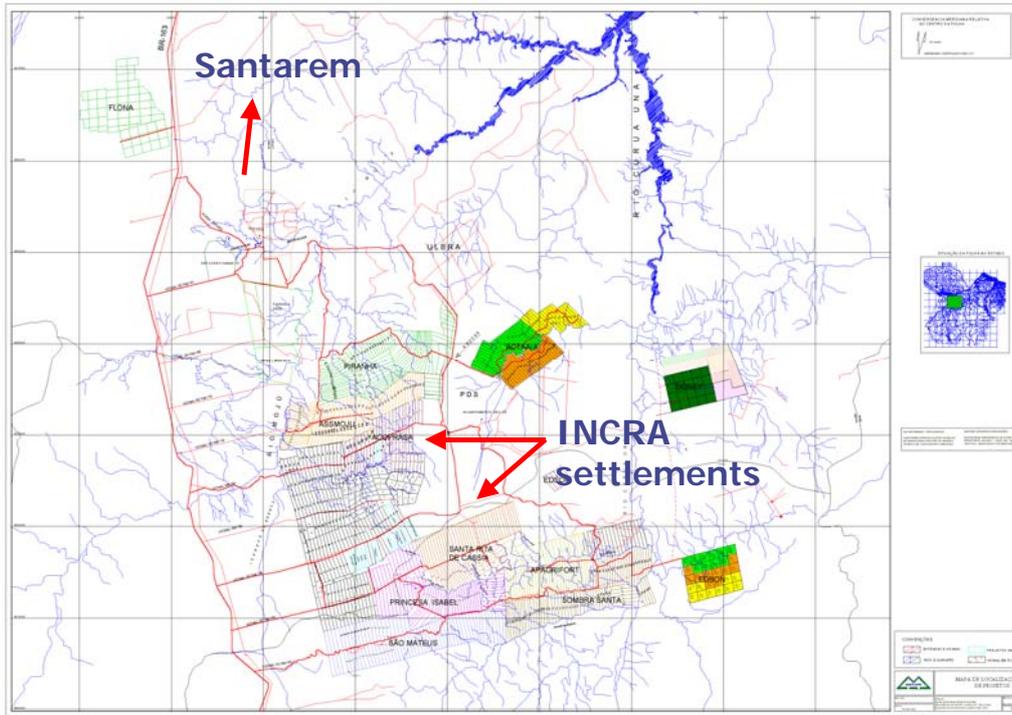
6.2.1 Community meetings

The process begins with the entry into the community and talking with the president of the community association (if there is one already formed) or a leader identified by community members. A meeting is called for lot owners (often the communities are not yet fully formed); any and all individuals are invited to attend. The first presentation is that of forest management and a demystification of the process. Many of the smallholders understand that they are legally allowed to clear 20 percent of their land – in this case approximately 20 hectares - and begin that process immediately upon taking possession of the lot.

The community meetings provide a forum to begin the negotiations and to answer questions. It is fully expected that without prior examples, at least 10 to 15 meetings will be held before the community is in a position to decide to sign a contract. During that time it is possible to advance to project by helping the community form an association (steps described below) as this is a benefit to the community and will be required for the logging contract.

6.2.2 Association formation

Different from the creation of a community itself, is the formation of the formal association within the community; it is a subset of the community and lot owners may be allocated lots by INCRA without choice, but it is their right to decline to participate in the association.

Although forest management is possible on individual lots, as described above, and does in fact occur, an important prerequisite for the community to be able to strengthen its negotiating position is the formation of an association and the bargaining of sales as a group. For example, one lot has on average 900 m3 of logs (approximately 180 trees), which is not very much. On the other hand, it would take only a community of 16 to provide a years worth of timber to an average sawmill with a consumption 15,000 m3 of logs and production of 5,000 m3 of sawnwood. The community could then bargain more effectively for higher prices and the inclusion of lesser-known species in the harvest.

Organized communities generally have a President or Coordinator who has decision-making powers and who informally or semi-informally represents the interests of the community. For these communities to become recognized formally they must be constituted (listed) as a Pessoa Jurídica, which is a formal "Legal Entity". For the communities to create, or become, a legal entity – which could be for example an "owner association", they must first discuss what type of organization will best serve their needs. Common forms of legal entities are:

Community association (Associação comunitária): an association that meets to resolve internal community problems, for example health, roads or community infrastructure.

Sindicate (Associação Sindical): a civil organization that defends the interests of a professional class. For example a common form is the Sindicate of Rural Workers.

Cooperative (Associação Cooperativista): these are associations based on common goals of production and economic development.

The associations must also have formal, registered statutes, which are the rules and norm by which the institution abides. They describe the structure and working of the institution. It is a legal document that binds the administration and organization of the association. The statutes are made formal through the process of voting in assembly, and once formal cannot be changed without the majority vote of the assembly.

The associations are registered formally in the government registry called "Titles and Documents" and this: (1) makes the contents uncontestable; (2) keeps an original, certified, copy on file; (3) guarantees the authenticity; and (4) makes the document valid against third parties according to Federal Law of Public Registry nº 6.015, 1973

What should be discussed in the meetings to form an association?

Constitution
    Name
    Purpose
    Duration
    Headquarters
    Objectives of the association
    How to achieve objectives
Members
    Who can be a member?
    What are the rights of the members?
    What are the duties of the members?
    What are the penalties that may be applied?
Goods and revenue of the association
    How will the association generate funds?
    What will be the contribution of the members?
    How will this be paid?
    Where and with whom can funds be sought?
Administration:
    How will the administration function?
    What shall each group (if pertinent) do within the association?

How are decisions to be made?
How are elections to be run?
How long shall officers serve?
What is the role and responsibility for each officer?
How will internal monitoring of the association work?
Dissolving the association
How can it be decided to dissolve the association?
How many votes will be necessary to dissolve the association?
How will the goods of the association be distributed?
General points:
Who will represent the association in selected issues?
How can the statutes be changed?
Will the directors be paid?
What will be the fiscal year?

6.2.3 Contracts

An example of the contracts drawn up between the community and logger is presented in **Annex I**. It establishes the legal obligations of both parties and is a fundamental part of the process. This document, however, binds the smallholder and logger to the first harvest only; future harvest is available for competition. Furthermore, this is not the document that binds the smallholder to leaving the forest once the first harvest is completed – that is the forest management plan, completed and filed in accordance with IBAMA regulations (a copy is available in Annex II).

6.2.4.   Legal deforestation and forest management plans

The smallholder is allowed to deforest up to 20 percent of the lot; in this case approximately 20 hectares. The rate of deforestation is at 3 ha per year or up to 60 cubic meters. The subcontracted logger is able to harvest this timber as well and is usually the first step in the process since the documentation of this activity is easier.

Because legal deforestation is done on many lots with little volume per lot it is quite likely that the logger will not gain a profit from this activity. The machines must be moved around more than in RIL. Remember that he/she must comply with road building commitments and has upfront planning and inventory costs. The legal deforestation does, however, present an important first step in the developing of trust between the loggers and smallholder, and as such should be kept in the contract.

Standard forest management plans for the "legal reserve" are drawn up for each lot and presented to IBAMA for approval. **Figure 4** shows a map of an individual

lot, similar to that presented to IBAMA. This is part of the work of the sub-contracted logger. It is much better for the sub-contractor to do this because it requires knowledge of management plans and the workings of IBAMA, which would be difficult for the smallholder to overcome. In addition, economies of scale can be captured in the investment in infrastructure (computers, office space, forest engineers etc) for a large number of plans rather than each individual smallholder producing a plan. Forest management with full approval by IBAMA is the only legal way in which the smallholder can use this land. Therefore the joint management with a logger

Figure 6.3. Individual lot identification, location, and soil use map produced by MAFLOPS.
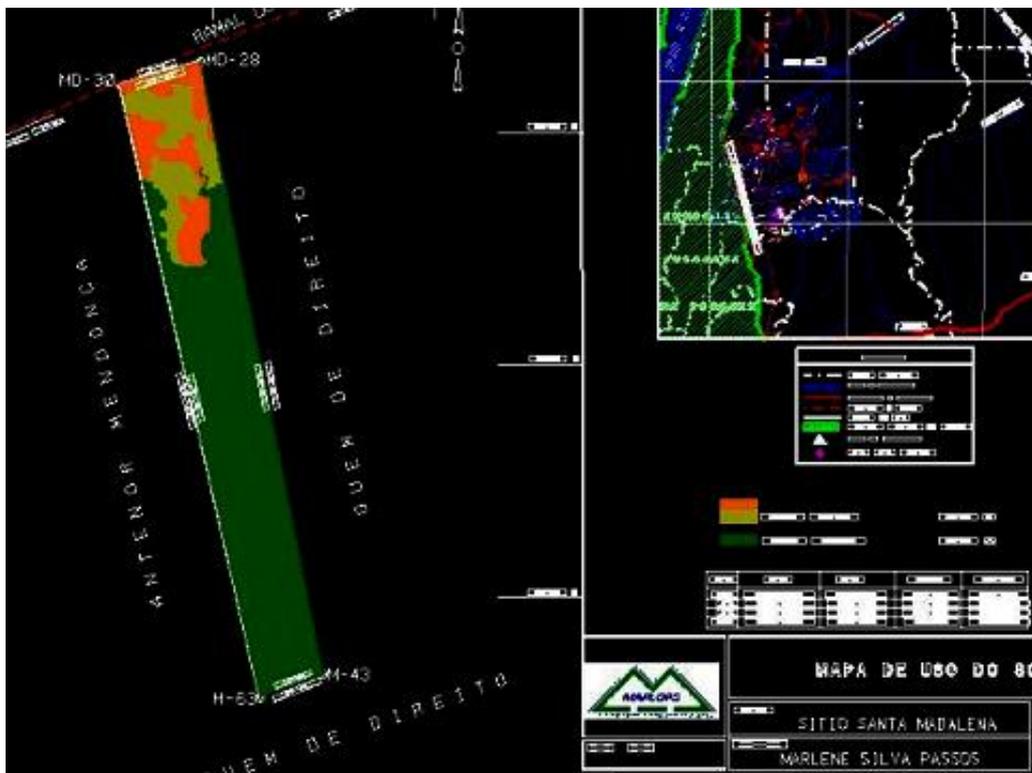
6.4. Forest management techniques for community lots.

The harvest process used in the management of community lots is to be based on the tenets of what has come to be known as "reduced impact logging". These are the best management practices available today, but are under constant revision and improvement.

Forest management (FM) is a broad concept, and not reserved exclusively for timber harvesting. It includes an array of forest-related activities such as wildlife management, extractive reserves, and recreation. Across much of the Amazon, however, the principal FM objective is the sustainable production of wood products. In this case, forest managers must consider the silvicultural requirements that will yield sustained timber volumes without compromising forest quality.

Although any harvest will alter the forest to some extent, reducing the impact is an important first step in the goal of sustainable production. Reduced-impact logging (RIL) provides standards for silvicultural activity and as such, is considered a necessary step toward achieving sustainable forest management.

Forest management and reduced impact logging guidelines are available from many sources - for example Suriname Agricultural Training Center (CELOS), International Tropical Timber Organization (ITTO), Food and Agricultural Organization (FAO), Institute of Humans and the Environment of the Amazon (IMAZON), and the Fundação Floresta Tropical (FFT). In addition, field models in Brazil demonstrate the improvements of FM-RIL practices over conventional logging. Specifically, FM-RIL methods reduce soil and canopy damage, protect future crop trees, and decrease waste by at least 50 percent (Johns 1997). In addition, these ecological benefits may be obtained without an increase in costs (Barreto et al. 1998, Holmes et al. 1999, Boltz et al. 2000, Holmes et al. 2000).

The process of reduced impact logging comprises any variation of the activities listed in **Table 1**, broken down into pre-harvest, harvest and post harvest activities, accompanied by a brief description of each activity. RIL plans begin with the activities listed above under pre-harvest activities. These include defining harvest areas, cutting inventory lines, and so forth. These activities include a 100 percent inventory of commercial and potentially commercial trees. In the annual operating plan the logger identifies those trees he/she expects to harvest in the upcoming year.

Table 6.1. Reduced Impact Logging Activities

Activity	Description
PRE-HARVEST ACTIVITIES	
Area definition and layout	Identifying future harvest area
Opening of inventory lines	Cutting lines 50 meters apart in future harvest block
Permanent plots	Setting aside areas for research in forest dynamics
100 % inventory	Locating, identifying, grading, and measuring commercial trees above standard diameter
Vine cutting	Cutting vines around crop trees to reduce felling damage
Planning harvest activities	
Data processing and tree selection	Selecting crop trees and processing harvest data
Mapping (pre and post harvest)	Using inventory data to show tree location (done both before and after harvest
Selection and marking of crop trees	Identifying crop trees in forest and producing a felling map
INFRASTRUCTURE	
Planning secondary roads	Planning roads into harvest site
Construction of secondary roads	Making roads to access harvest site
Planning of log decks	Locating log deck sites
Construction of log decks	Making log decks
HARVEST ACTIVITIES	
Directional felling	Judging tree quality, testing for hollow, felling and identifying fall direction on felling map
Skid trail layout	Use felling map to design shortest skid trail, mark skid trail for Skidder
Skidding	Follow marked skid trail to log, skid log to log deck
Log deck operations	Measure logs, stack logs according to use

Reflections on a Visit to the Forest Families Programme
André da Silva Dias, Executive Manager, Fundação Floresta Tropical
December 2003

Forest management models that can contribute to the social, environmental, and economic development of smallholders and traditional populations have been the subject of many recent initiatives in the Amazon. The "Forest Family" programme works with a specific relationship that appears to be very common, but little studied: smallholders and the timber industry.

It is interesting to note some of the fundamental characteristics around which the program is built: the relationship between the smallholder and the industry already exists; its foundation is market-based; its actors are well-defined; and is based on uncommonly strong legal and ethical rigor. The last characteristic, alone, makes one pay attention.

One can question whether this is community forest management or not. A pertinent doubt, but, in the end, there exists a forest and its resources and a people organized, or organizing, in communities.

In fact, the smallholders are not directly managing their forests: they delegate this activity to a subcontractor and his team. And when they delegate they relinquish some personal control of the forest. However, they exercise their rights to the forest in a free manner, in a negotiation process that strengthens the local organization, generates collective responsibility, creates a commonly used infrastructure, provides income and most importantly: gives value to the standing forest. All of which are the principles that underlie community forest management

It is possible to imagine a scenario in which they should manage their own forests in accordance with their capacity, limitation, abilities, and interests. Perhaps this will happen one day. But for right now, the reality is different. No better and no worse, this is just different than many other community forest management initiatives where the local residents play the role of managers. The fact is that, they, the owners, are who should say whether this is how it should be. And they seem to be making this in an informed way, understanding their limitations, and identifying opportunities.

It is interesting to observe a community and its people, in this case Santo Antonio, started barely two years ago by families of different origin who until this point never knew each other, who already have solid development plans and a growing autonomy in the formulation of local projects, rather that just hope of better days.

I believe that one of the principal contributions that this program can lend to the discussion of local forest management is to define criteria and indicators of a healthy and egalitarian relationship between smallholders and the timber industry.

 To get there, some challenges that deserve more attention are:

- Improve local knowledge of good forest management practices.
- Identify the impact of timber harvest on the supply of hunting and non-timber forest products.
- Analyze the socio-economic impact of the timber income on the smallholder systems.

7. OVERCOMING MARGINALISATION IN COMMUNITIES THROUGH COMMUNITY ASSOCIATION

7.1. *Introduction*

The data for these studies was collected in 2 separate surveys. The floodplain communities were surveyed in 2000 and the settlement communities were surveyed in between February and June 2003. The two surveys had different formats, but ask many of the same questions about production, community agreements, land, labour, and capital. An example of the survey used in the settlement communities is shown in Annex II.

7.2. *Study objectives*

The objective of this study is to develop qualitative and quantitative measures of success in the formation of community associations, and the effect on individual wealth as a result of these associations. To that end we collected data from two separate, and very distinct, communities. The first described here are migrant communities in the INCRA settlements of Moju I and II. These settlements hold a rough estimate of 1,600 families. These include families that had been settled in previous colonization projects – principally those communities close to the BR 163 - and illegal squatters, known as *Posseiros*.

The second set of communities is the more traditional floodplain communities. Here community organization is based around fishing accords, which protect the right to access to lake fisheries. In this study we attempt to identify and quantify the characteristics of individuals that determine whether they view accords as successful.

Although the communities are fundamentally different and the resource in question also, the issue of interest - what determines whether an individual views his/her community association as successful – is common to both.

7.3. *Migrant communities: descriptive statistics*

We begin the discussion about migrant communities with an overview of the descriptive statistics generated from the survey. A total of 360 interviews were administered in 19 communities of the INCRA settlements Moju I and II. Thes communities are located on the feeder roads of the BR 163 (Santarém- Cuiaba Highway) between kilometres 101 to 145 south of the city of Santarém. The fieldwork was completed from March to June of 2003.

The interviews were conducted to specifically address the impact of the tool in question on community association and development. Therefore a special effort was made in the communities in which timber harvest had already occurred (Anta and Santo Antonio). Table 1 shows the number of surveys administered by community with the two communities in bold – that patterns holds for the rest of the data shown in this sequence of tables.

At the time of the interviews there had also been some harvest of legal deforestation in the community of Piranha, but the major influence of this tool on the perception of community association is felt when income from forest management is paid. Legal deforestation allows the harvest and sale of wood from 3 hectares (up to 60 cubic meters per year) until a total of 20 percent of the land is deforested. Therefore the potential income is approximately R$ 900. Forest management on the other hand can produce anywhere between $8,000 to R$ 20,000.

Eighty eight percent of the interviewees were male (n=360), 46 years old (sd= 2.5, n=360), with 3.74 dependents – other members of the family (sd=2.23, n=360). Eighty two percent (n=358) of families had at least one literate person; 58 percent of the families had at least one person going to school at the time (n=345), and schools were and average of 4.5 km away (sd=5.7, n=163).

Very few of the smallholders have water in their homes, most either have wells, or get it from a nearby river. The mean distance to the water source is 313 meters (sd=636, n=357), water is collected on average 4.5 times per day (sd = 4.85, n= 346), and the time it takes collect the water per trip is 22 minutes (sd = 33, n= 330). It is important to note that this varies considerably between lots (see standard deviation for distance) and that some areas are very much drier that others; in which case access to water becomes a more important investment option. The minimum for this statistic is zero meters - water piped to the house - but the maximum is five kilometres.

Ninety six percent (n=360) of the interviewees reported owning their lots. This does not imply that they have formal title or formal right to sell the land. Instead they will have a proclamation from INCRA that have been settled ont hat land; some may have even bought that right to settle. Once you have sold you proclamation, however, you no longer have right to another INCRA lot. This does not stop the sale of "land improvements" and the migration and squatting on distant lots. Only 11 percent of the sample stated that they held definite title to the land. Sixty percent of the interviewees (n=339) had been officially settled by INCRA, 12 percent had squatted (n=339), and 28 percent (n=339) had bought the land. Respondents have been on the lots for an average of 6.8 years (sd=6.3, n=355). There was, however, a range of residence from 26 years to 2 months.

The average lot size is 94 hectares (sd=13, n=357), and is on average 26 kilometres (sd=18, n=356) from the highway BR163. That distance is broken down into several types of road including forest trail. There are basically four descriptions of road (with mean distance, sd, and n= in parentheses) listed in increasing quality: forest trail (400 meters, sd=1,650 meters, n=351); secondary dirt road (1 kilometre, sd=2.76 kilometres, n=356); temporary dirt highway (6.75 kilometres, sd=14 kilometres, n=355); and all-weather dirt highway (18 kilometres, sd=9.8 kilometres, n=356). **Table 7.1** below shows the average distance to the BR163 for each of the communities surveyed, ranging from Unidos por Deus at 5.4 km to Anta at 53.4 km. The individual minimum was 15 meters and the maximum 82 km. On average, roads had been available to the smallholders for 6.25 years (sd=6.6, n=326), showing that roads appear about 6 months after the owners settle on the lots.

The value of capital items owned by the smallholders (ie, chainsaw, motorbike, tools, etc) was R$ 2,511 (sd=3,871, n=201). The average value of their house was R$ 1,156 (sd=735, n=338), and the estimated value of their livestock (cattle, poultry, etc) was R$2,620 (sd=5,099, n=266). There is obviously a large range of animal values (R$5 to R$41,800) as some farms are more concentrated on animal production. Furthermore, in discussion it was apparent that many of the smallholders aspire to own cattle. **Table 2** shows the value of capital items, house, and animals by community.

Because land sales are often not formally registered establishing a value for the lots is difficult. To overcome this hurdle, we asked the respondents to estimate a value their lots. Given that ownership right, although perhaps informal, is clearly established the lot value is what the owner is willing to sell it for. We do recognizing that asking prices are not always sales prices, but these are the best available estimates of land values for the region. That said, the average value for the lot was R$ 24,790 (sd=26,111, n=290); the range was from R$80 to R$150,000. Estimated values by community are given in Table X1 where the averages are from R$ 6,904 in Santa Rita de Cassia to R$ 56,863 in Cristo Rei. Looking at **Table 3**, one can see a rough correlation that lot value is inversely related to the distance from the BR 163.

When receiving or purchasing the lots, the smallholder found an average of 2.5 hectares deforested (sd=5.9, n=356), and has cleared and average of 8.8 hectares (sd=11.7, n=351) for a total average clearing of 11.25 ha (sd=12.77, n=352); roughly 13 percent, well under the legal 20 percent limit. When looking at deforestation by community **(Table 4)** we again can see a pattern of time on the lot affecting an activity - in this case deforestation and deforestation rates. In the case of total deforestation, the older communities appear to have deforested a greater area. But looking at the rate of land clearing (ha per year on the lot) it is possible to see that the younger communities are clearing at a higher rate. This

leads to a hypothesis that over time, the rate of land clearing goes down as individuals become constrained by the availability of labour and capital inputs. It is also important to note that the community forest management tool will not reduce deforestation, since the legal harvest of deforested timber is part of the project. However, different to previous projects, the harvest of legal deforestation will reduce the waste by taking large trees out of the area to be deforested that would otherwise be burned, and should make the task of land clearing easier and increase labour productivity.

Table 5 shows the value of agricultural production per year, broken down into the value of agricultural products sold and consumed. Only a few communities consume more that they produce Santa Rita de Cássia, Fortaleza, Terra Santa, São Miguel, Corpus Cristy, and São Pedro. For the whole sample, the average value of agricultural products sold was R$ 1,064 (sd=2,184, n=316) and agricultural products consumed R$ 836 (sd=1,313, n=316); there was no significant difference between the two means. The average area harvested to for this produce was 1.64 ha (sd=1.6, n=355). Agriculture is completed without the use of fertilizer (1 percent use) or pesticides (5 percent use). This compares favourably with earlier studies of farmers in this region where fertilizer and pesticide use was also not apparent (Sactena et al. 1996). Only nine percent of the interviewees reported receiving any credit assistance.

For the most part, agricultural products are sold in the nearest market town (Santarém). Thirty percent of the respondents reported not selling their products (n=317), 8.5 percent said they sold their agricultural products at the farm aget, an 60 percent sold their product in Santarém. The most common form of transportation is by bus; in fact all of the agricultural products sold were transported by bus in 60 kilo sacks. The average costs of trans port for the sacks is R$ 2.24 (sd=0.65, n=194) for an average 5 hour trip (sd=1hr 15 minutes, n=174). Community level data is available in **Table 6**.

The average number of families in the communities is 42 (sd=17, n=76). Ninety percent of the smallholders said that there was a community association in their community. The estimated number of families in per community association was 41 (sd=20, n=89). Communities have been active for an average of 4.5 years (sd=3.1, n=132). In all three of these answers, it is clear by the number of answers that many people did not know much of the community actions and history and so did not answer. Only 54 percent of the respondents said that they actively participated in the community association. Forty two percent consider their association to be inactive; 30 percent consider their community association activity to be "reasonable"; 26 percent consider it to be "good"; and 2.6 percent consider their association to be excellent (n=192 of a total 360). We expect these numbers to be different for the communities that work with the community forest management tool, and is a part of our empirical analysis presented below.

On average smallholders worked 7:19 hours (sd=2:05, n=345) in the dry season and 6:17 hours (sd=2:10, n=345) in the wet season (significant difference between means at p≤0.05). Forty six percent (n=360) of the smallholders hire labour for an average of 3.03 days per month (sd=6.1, n=348). The average daily wage paid is R$ 9.38 (sd=2.27, n=152). In addition, to hiring labour, there exists a large informal labour market; 54 percent of the respondents exchange day labour with their neighbours. In this system, an individual will work on another lot in return for the owner of the second lot working a day on his. The number of days exchanged per month in the dry season was estimated at 3.3 (sd=7.12, n=318), and the in the wet season that dropped to 1.85 (sd=3.2, n=318) - (significant difference between means at p≤0.05).

In addition, 45 percent of the respondents were employed off farm (n=358). The mean number of days worked off farm per month in the dry season was 4.5 (sd=7.5, n=350), and in the wet season 3.2 (sd=5.6, n=349) - (significant difference between means at p≤0.05). Wages in the dry and wet season were R$ 14.4 per day (sd=11.3, n=137) and 13.3 per day (sd=8.6, n=117), respectively - (no significant difference between means at p≤0.05). Total off-farm earnings in the dry season were estimated at R$ 588 (sd=1,180, n=350), and in the wet season R$ 421 (sd=756, n=350) -(significant difference between means at p≤0.05).

Although not included in the estimates of off-farm income, retirement income is also important and so are remittances from family members not living on the farm. On average there were 0.43 people contributing to farm income from off-farm (sd=0.79, n=360). The range went from zero to five people; monthly remittance during the dry season was estimated at R$ 44 (sd=93, n=357), and R$ 42 during the wet season (sd=92, n=356) - (no significant difference between means at p≤0.05). Monthly off-farm purchases were estimated at R$ 150 per month (sd=100, n=351).

Table 7 shows total agricultural production values and compares them to total annual off farm earnings. Loosely speaking, but not unexpected, the newer communities produce less of agricultural value. Also the total values column represents an approximate grading of poverty in the communities; those that produce less total value of agricultural products are generally poorer. Surprisingly, Anta, which is a new community, but is involved in the community forest management tool presented in this report has the highest average off farm earnings at R$ 1,487.

Twenty six percent of the interviewees said that they were involved in community forest management, but only 13 percent of the interviewees said that they actively participate in forest management projects (n=348). This discrepancy can be explained in the fact that they can be involved in community forestry but as yet

not have had any wood harvested from their land; the process of harvest for any community is usually two to three years. Sixty two percent (n=348) had only heard about forest management, but did not participate; and 24 percent (n=348) had never heard of forest management. Only 12 percent (n=360) of the respondents said that they knew the volume of timber on their lot. Fifty four percent of the respondents (n=360), however, had sold wood at some time. Of those, 92 percent had sold stumpage (ie, standing tree) and 0nly eight percent (had sold to a sawmill (ie, transported to mill). Interestingly, 69 percent (n=360) of the respondents said that they intended to sell wood in the future. This implies that wood sales are seen an important potential source of income.

On average, smallholders collect non-timber forest products (NTFPs) on 0.5 days per month during the dry season (sd=1.1, n=319) and 2.1 days per month during the wet season (sd=4.2, n=320) - (significant difference between means at p≤0.05). Twenty two percent of the respondents reported collecting NTFPs during the dry season and 44 percent said they collected during the wet season. Of those who collected NTFPs in the dry season the average number of days per months that they collected was 1.93 (sd=1.5, n=79). In the wet season this rose to 4.21 days per month (sd=5.18, n=157). The average trip time was 1 hour and 20 minutes (sd=2, n=182). Only 13 percent of the respondents thought that timber harvest affected NTFPs.

Fifty four percent of the respondents admitted to hunting (n=360), doing so on 2.6 days per month in the dry season (sd=4.3, n=351) and o.9 days per month in the wet season (sd=2.2, n=349). Overall they estimated a success rate of 28 percent (n=177).

Table 2. Value of capital items, livestock and houses by individual community

Community	R$ Capital Items	Community	R$ Livestock	Community	R$ House
Anta	**1,626**	**Anta**	**194**	**Anta**	**789**
Santa Rita de Cássia	1,787	Pau Rosa	374	Princesa Isabel	890
Princesa Isabel	2,434	Princesa Isabel	440	São Miguel	1,041
Unidos por Deus	2,716	Santa Rita de Cássia	583	São João	1,047
Fortaleza	2,756	Piranha	688	Santa Rita de Cássia	1,056
Terra Santa	2,868	Unidos por Deus	1,016	Boa vista	1,100
Santo Antônio	**3,477**	São João	1,066	Unidos por Deus	1,233
São João	3,493	**Santo Antônio**	**1,316**	Fortaleza	1,250
Piranha	3,911	Terra Santa	1,413	Terra Santa	1,300
Pau Rosa	4,373	Fortaleza	2,418	Corpus Cristy	1,352
São Miguel	5,102	Nova Canaã	2,566	Nova Canaã	1,403
Boa vista	5,448	Boa vista	3,107	Pau Rosa	1,422
Cristo Rei	6,468	São Miguel	3,240	Piranha	1,427
Nova Canaã	6,933	Cristo Rei	3,852	Galiléia	1,447
Galiléia	7,788	Galiléia	4,194	N. S. Navegantes	1,464
N. S. Navegantes	8,976	N. S. Navegantes	5,585	São Pedro	1,500
São Pedro	9,171	São Pedro	6,284	Cristo Rei	1,538
Corpus Cristy	9,521	Corpus Cristy	7,721	**Santo Antônio**	**1,740**

Table 3. Year on lot, distance from the main highway and land values

Community	Years on lot	Community	Km from BR	Community	R$ Lot value
Fortaleza	2.2	Unidos por Deus	5.4	Santa Rita de Cássia	6,904
Santa Rita de Cássia	2.3	Cristo Rei	6.1	São Miguel	11,636
Anta	**2.7**	Galiléia	6.2	Princesa Isabel	14,048
Santo Antônio	**2.8**	Pau Rosa	7.4	**Santo Antônio**	**14,289**
Princesa Isabel	3.0	São Pedro	7.7	Fortaleza	18,333
São Miguel	3.7	Nova Canaã	12.5	Boa vista	19,773
Piranha	3.9	N. S. Navegantes	13.6	**Anta**	**21,472**
Terra Santa	6.7	Corpus Cristy	15.5	Piranha	22,071
São João	6.7	São João	15.9	Terra Santa	25,000
Boa vista	6.7	Boa vista	20.4	N. S. Navegantes	26,500
Nova Canaã	9.1	São Miguel	21.7	Nova Canaã	31,560
N. S. Navegantes	10.4	Princesa Isabel	23.5	São Pedro	37,143
Corpus Cristy	11.7	**Santo Antônio**	**27.0**	Corpus Cristy	37,267
São Pedro	12.1	Santa Rita de Cássia	37.9	São João	37,938
Unidos por Deus	12.5	Terra Santa	41.7	Unidos por Deus	42,500
Pau Rosa	12.9	Fortaleza	47.9	Pau Rosa	43,278
Cristo Rei	16.6	Piranha	48.0	Galiléia	50,000
Galiléia	18.4	**Anta**	**53.4**	Cristo Rei	56,863

Table 4. Deforestation, years in residence and deforestation rates

Community	Hectares deforested	Community	Years on lot	Community	Ha/Year
Santa Rita de Cássia	3.8	Fortaleza	2.2	Terra Santa	0.66
Anta	**4.1**	Santa Rita de Cássia	2.3	Santa Rita de Cássia	0.70
Santo Antônio	**4.3**	**Anta**	**2.7**	Nova Canaã	0.94
Fortaleza	4.7	**Santo Antônio**	**2.8**	Galiléia	0.95
Terra Santa	5.0	Princesa Isabel	3.0	São Pedro	1.00
Princesa Isabel	5.4	São Miguel	3.7	Pau Rosa	1.06
Piranha	6.1	Piranha	3.9	Boa vista	1.08
Boa vista	8.9	Terra Santa	6.7	Piranha	1.19
São Miguel	11.8	São João	6.7	Corpus Cristy	1.27
Nova Canaã	13.6	Boa vista	6.7	Princesa Isabel	1.27
São João	13.9	Nova Canaã	9.1	**Santo Antônio**	**1.40**
N. S. Navegantes	15.9	N. S. Navegantes	10.4	N. S. Navegantes	1.43
Pau Rosa	18.1	Corpus Cristy	11.7	**Anta**	**1.48**
Corpus Cristy	21.7	São Pedro	12.1	Cristo Rei	1.64
Galiléia	22.3	Unidos por Deus	12.5	Unidos por Deus	1.87
São Pedro	23.3	Pau Rosa	12.9	São João	2.05
Unidos por Deus	26.3	Cristo Rei	16.6	Fortaleza	2.11
Cristo Rei	34.9	Galiléia	18.4	São Miguel	2.91

Table 5. Value of agricultural products sold (APS), and agricultural products consumed (APC)

Community	APS R$/Year	Community**	APC R$/Year
Fortaleza	0	Princesa Isabel	363
Terra Santa	200	Santa Rita de Cássia**	406
Santa Rita de Cássia	275	Fortaleza**	440
São Miguel	618	Terra Santa**	452
Anta	**663**	**Anta**	**506**
São Pedro	915	São João	589
Corpus Cristy	951	Unidos por Deus	613
Santo Antônio	**1,144**	São Miguel**	698
Piranha	1,334	**Santo Antônio**	**735**
São João	1,515	Galiléia	824
Princesa Isabel	1,641	Cristo Rei	839
N. S. Navegantes	1,643	Piranha	966
Boa vista	1,983	N. S. Navegantes	1,001
Unidos por Deus	2,025	Boa vista	1,092
Cristo Rei	2,062	Corpus Cristy**	1,124
Galiléia	2,099	Nova Canaã	1,449
Nova Canaã	2,107	São Pedro**	1,517
Pau Rosa	2,444	Pau Rosa	1,738

** Consumes greater value than sales

Table 6 Transport times and costs by community

Community	Hours:minutes	Community	R$ per 60-kilo Sack
Fortaleza	n.a.	Fortaleza	n.a.
Pau Rosa	2:48	N. S. Navegantes	1.9
Cristo Rei	3:48	Nova Canaã	2.0
São Pedro	4:00	Princesa Isabel	2.0
Terra Santa	4:00	Santa Rita de Cássia	2.0
Unidos por Deus	4:00	São Miguel	2.0
N. S. Navegantes	4:30	Unidos por Deus	2.0
São João	4:32	Boa vista	2.1
Piranha	4:43	Cristo Rei	2.1
Princesa Isabel	4:51	Galiléia	2.1
Santo Antônio	**4:56**	Pau Rosa	2.1
Galiléia	5:00	**Santo Antônio**	**2.4**
Nova Canaã	5:00	São Pedro	2.4
São Miguel	5:00	Piranha	2.5
Santa Rita de Cássia	5:07	São João	2.5
Anta	**5:22**	**Anta**	**2.6**
Corpus Cristy	5:40	Corpus Cristy	2.6
Boa vista	6:30	Terra Santa	3.0

n.a. not applicable because there were no sales of agricultural products from this community

Table 7. Comparison between off-farm income earned and the value of annual agricultural production (including consumption)

Community**	Annual off-farm income R$/year	Community	Annual agricultural production R$/Year
Terra Santa	66	Fortaleza	440
São João	156	Terra Santa	652
Boa vista	245	Santa Rita de Cássia	681
São Pedro	257	**Anta**	**1,169**
Piranha	332	São Miguel	1,315
Galiléia	345	**Santo Antônio**	**1,878**
N. S. Navegantes	408	Princesa Isabel	2,003
Corpus Cristy	451	Corpus Cristy	2,074
Cristo Rei	506	São João	2,104
Santo Antônio	**639**	Piranha	2,300
Princesa Isabel	778	São Pedro	2,432
Nova Canaã	881	Unidos por Deus	2,638
Santa Rita de Cássia**	886	N. S. Navegantes	2,643
Fortaleza**	1036	Cristo Rei	2,901
Pau Rosa	1223	Galiléia	2,922
São Miguel	1262	Boa vista	3,075
Unidos por Deus	1440	Nova Canaã	3,556
Anta**	**1487**	Pau Rosa	4,181

** Off-farm income greater than agricultural production value

7.3. Non-migrant (floodplain) communities: descriptive statistics

The data for this section was collected in a survey of floodplain communities conducted in 2000[3] and has been used in analysis of co-management on fishery productivity (Almeida et al. 2002). This work is an extension of the research, delving into how individuals perceive community fishing accords.

The average age of the respondent on the floodplain is 48 (sd=15 n=256), and the average family size if 6.7 (sd=3.3, n=254). The individuals had lived for an average of 39 years in the community (sd=19, n=255). Ninety percent (n=256) of the individuals fished, 40 percent for consumption purposes only and 44 percent for both consumption and sales. Seven percent own a fishing boat – ie, a large boat (approximately 10 mts) that allows the individual to fish for many days at a time with other fishermen aboard. The average investment in fishing nets is 363 Reais (sd=540, n=224).

Eighty seven percent of the respondents said that there exists a fishing accord in their community, 64 percent of which had been legalized by IBAMA. The average age of the accords is ten years (sd=0.83, n=193) but had only been formally legalized for 2.7 years.

Forty one percent (n=251) of the respondents said that there was an environmental agent in the community. The environmental agent is a community resident who is responsible for oversight of the accord. Sixty five percent (n=221) of the respondents said that the fishing accord worked well and estimated that 61 percent (n=214) of the community members abide by the accord. Eighty six percent of the respondents (n=223) suggested that the accord had a positive effect on the fishery, with 57 percent (n=223) saying that the productivity had increased 'a lot' and 20 percent (n=223) saying that it had increased productivity 'a little'. Eleven percent of the respondents (n=248) also said that accords in other communities affected their fishing.

Eighty percent of the respondents (n=256) live on land that they or their father owns their land, but less than five percent pay land tax (ITR). The estimated value of land is 5,333 Rs (sd=7,600, n=175). The house values were estimated at 2,441 Rs (sd=738, n=245) and capital items at 2,243 (sd=4,162, n=245). Fifty seven percent of the respondents (n=256) planted some form of agriculture in the previous year on an average of 1.76 hectares (sd=2.8, n=91). Average value of

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[3] The original data collection for the floodplain communities was supported by the Darwin Initiative of the Ministry of the Environment UK, also WWF, and DFID.

agricultural sales was 379 Rs (sd=751, n=256) and value of in-house consumption of agricultural products was 192 Rs (sd=367, n=256).

Forty eight percent (n=256) own cattle with an average herd size of 48. The herd is divided into cattle they own (x=20, sd=27, n=123) and cattle they produce on cooperation with another person (x=28, sd=36, n=43). The respondents spend an average of 3.3 hours a day (sd=2.4, n=42) managing their cattle herd. Four percent of the individuals own water buffalo (n=256) and the herd sizes were only 11 (sd=13, n=11). Average cattle sales in the year of the interview were 373 Rs (sd=1,845, n=125).

7.4. Empirical analysis

In this section we consider what determines whether an individual ranks his/her community association as being effective of not. We are particularly interested in the impact of formal logging contracts on local institutions in migrant communities. In the floodplain communities we are interested in what makes an individual rank a fishing accord as 'working well'. The results presented here are preliminary efforts to estimate these relationships.

For empirical analysis we use a class of models in which the dependent variable takes a discrete rather than continuous values. The models estimated here for the migrant communities are a logistic regression model whose dependent variable is the whether the individual participates in the community association or not, a logistic model that examines whether the individual believes that the associations is anything other than inactive (positive) and a multinomial logistic regressions in which the dependent variable is a choice of community association quality.

For the floodplain communities as similar technique is used; a logistic regression model whose dependent variable is the whether fishing accords worked well or not. The multinomial logit and logit models, as used in this study, are appropriate for this type of analysis when we examine individual choice (Greene 2000).

The general form of the multinomial logit model (Greene 2000) is,

$$\Pr ob(Y_i = j) = \frac{e^{\beta_j' x_i}}{\sum_{k=0}^{2} e^{\beta_k' x_i}}, j = 0,1,2$$

where, for example, j is the choice of community association ranking 0 = inactive, 1= reasonable, and 2 = good. Individual characteristics of the respondents are listed in the vector x_i. In these models we are particularly interested in the marginal effects, which respond to the probabilities of an individual choice.

7.5. *Results for migrant communities*

In this section we present the results of the regressions on community participation and the impact of formal logging contacts on participation and ranking. We then examine the impact of participation in the community association on land use (clearing). We use six independent variables in the preliminary set of regressions (Table 7.1), which include: (IMAFCA) whether the individual is in one of the two communities that have had logging and income generated from participation in formal logging contracts – a measure of the actual impact of the logging contracts because money had been generated; (FAMSZ) family size; (YRONL) years the individual has bee living on the lot; (ISW) whether the individual intends to sell wood in the future; (HOFM) whether the individual had heard about forest management, but had not actually participated in it – a measure of the difference between hearing about and actually having field/financial experience with logging; and (VALCI) the value of capital items owned by the individual. Table 7.2 shows the descriptive statistics for the variables used in the regressions; more detailed discussion is provided above in the descriptive statistics of section 7.2.

7.5.1. Participation in Community Associations

The results for the logit regression for participation in community associations are shown below. The question to be answered was 'do you participate in the community association?', which could be answered yes or no. This leads to the use of a simple logit regression to analyze the results. In Table 7.3 we can see that the regression was satisfactory and the coefficients significant. From the marginal effects of this estimation, we can say that a formal logging contract increases the likelihood of participating by 46 percent: and addition to the family decreases the likelihood of participation by six percent; time on the lot is not significant; if an individual intends to sell wood, they are 25 percent more likely to participate in the association; if they have heard of forest management but have not been involved directly in it, they are 22 percent less likely to participate in the association; and finally more wealthy families are less likely to participate in the association. Although the last result (VALCI) is significant, the actual impact is negligible and could probably be ignored.

Table 7.1. Descriptive statistics for the regression variables

Variable	Description
IMAFCA	Dummy = 1 if individual resides in the one of the two communities that have formal logging contracts and where logging has already occured
FAMSZ	Family size
YRONL	Years in residence on the lot
ISW	Dummy = 1 if individual intends to sell wood in the future
HOFM	Dummy = 1 if individual has only heard of forest management but has not participated in it
VALCI	Value of capital items

Table 7.2. Descriptive statistics of the variables used in the regressions

Variable	Mean	St.Dev.	min	max	n=
IMAFCA	0.19	0.39	0	1	360
FAMSZ	4.74	2.22	1	15	360
YRONL	6.77	6.27	0.1	26	355
ISW	0.68	0.46	0	1	360
HOFM	0.63	0.48	0	1	348
VALCI	2,511	3,871	70	27,500	201

Table 7.3. Coefficients and marginal effects of participation in community associations (logit model)

Variable	Coefficient Value	Marginal Effect	t-statistics (b/st.err)
Constant	1.47	0.37	(2.0)*
IMAFCA	2.33	0.46	(2.4)**
FAMSZ	-0.25	-0.06	(2.4)***
YRONL	0.00	0.01	(0.3)
ISW	1.02	0.25	(2.9)***
HOFM	-0.92	-0.22	(2.2)**
VALCI	-0.00	-0.00	(2.7)***
Number of observations	192		
Log likelihood function	-101.89		
Restricted log likelihood	-132.93		
Chi squared	62.08		
Degrees of freedom	6		
Prob[ChiSqd > value] =	0.00		
Pct. Correct Predicted	57		

* significant at 0.10, **significant at 0.05, *** significant at 0.01

[a] –0.001 lost due to rounding

[b] significant at 0.15

7.5.2. Ranking the Community Association

In this section we try to determine how formal logging contracts affect the perception of the association on the part of the individual. The interviewee was asked to rank the community association as inactive, reasonable, or good.

We examine the responses with two techniques, a logit model, in which the respondent considers whether the association is either inactive or not, and a multinomial logit model in which the respondent has all three categories of inactive, reasonable, or good.

The results for the simple ranking clearly show that having a formal logging contract in the community increases the perception of association quality. In fact those in the communities that had already had logging done on their forests were 67 percent more likely to rate the association positively. Family size and the years on the lot also appear to influence the perception of how well the association works – perhaps due to having seen results appear over time. The intention of selling wood and whether the respondent had heard of forest management were insignificant in determining simple ranking. Finally wealthier families appear to rank association positively but the effect is minimal.

Table 7.5 shows the results separated into a complex ranking in which the individual can rank the association by any of the three options. The results have mostly the correct sign, but and the equation is significant, but individual coefficients were less so for parts of the equation. Yet it is clear that the influence of living in the two communities that have had results from the logging contracts is strong. In this case, residents those communities are 37 % less likely to rank the association as inactive, 61 % percent more likely to rank it as reasonable and 74 % more likely to rank it as good than those individuals living in other communities. This shows a strong result for the ability formal logging contracts to change the view of the individuals about how well associations work. We also assume that if people are saying that associations work well, it is because they have felt some positive influence of the associations.

Table 7.4. Coefficients and marginal effects of simple ranking (logit) for community association quality.

Variable	Coefficient Value	Marginal Effect	t-statistics (b/st.err)
Constant	-2.50	-0.60	(2.2)**
IMAFCA	5.48	0.67	(2.7)***
FAMSZ	0.33	0.78	(1.8)*
YRONL	0.11	0.26	(2.5)**
ISW	0.77	0.19	(1.3)
HOFM	-0.17	-0.04	(0.3)
VALCI	0.00	-0.00	(1.7)*
Number of observations	98		
Log likelihood function	-42		
Restricted log likelihood	-68		
Chi squared	51		
Degrees of freedom	6		
Prob[ChiSqd > value] =	0.00		
Pct. Correct Predicted.	68		

* significant at 0.10, **significant at 0.05, *** significant at 0.01
[a] –0.0013 lost due to rounding

Table 7.5. Coefficients and marginal effects of complex ranking (multinomial logit) for community association quality.

Variable	Coefficient Value	Marginal Effect	t-statistics (b/st.err)
[Y = 0] INACTIVE			
Constant		0.83	
IMAFCA		-1.37	
FAMSZ		-0.77	
YRONL		-0.03	
ISW		-0.21	
HOFM		0.04	
VALCI		0.00	
[Y = 1] REASONABLE			
Constant	-1.79	0.18	(1.3)
IMAFCA	5.45	0.61	(2.6)***
FAMSZ	0.30	0.03	(1.5)
YRONL	0.07	0.00	(1.2)
ISW	-0.32	-0.22	(0.5)
HOFM	-0.49	-0.11	(0.7)
VALCI	-0.00 [a]	-0.00	(1.5)
[Y = 2] GOOD			
Constant	-4.70	-0.84	(3.2)***
IMAFCA	5.58	0.74	(2.7)***
FAMSZ	0.32	0.04	(1.6)
YRONL	0.14	0.24	(2.7)***
ISW	2.03	0.45	(2.5)**
HOFM	0.15	0.07	(0.2)
VALCI	-0.00 [a]	-0.00	(1.4)
Number of observations	98		
Log likelihood function	-72		
Restricted log likelihood	-104		
Chi squared	63		
Degrees of freedom	12		
Prob[ChiSqd > value] =	0.00		
Pct. Correct Predicted.	55		

*significant at 0.10, **significant at 0.05, *** significant at 0.01

[a] lost due to rounding

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7.6 Results for floodplain communities

In the analysis of floodplain communities, the individuals were asked whether they considered the fishing accords to 'work well'. We use six variables (Table 7.6 and 7.7) to explain the likelihood of an individual considers the accord to be successful: whether the individual knows that there is an environmental agent in the community (EAAC); the value of goods in the house (VBCASA), which we use as proxy for wealth to see if wealthier individuals view the accords from a different perspective; whether the individual considers the fishing to have increased a lot (QPAM) or a little (QPAP), which we use to examine if accords can be judged successful in the short term with just incremental increases in fishing; whether an individual fishes only for consumption purposes (PCON), which we use to judge how fishing strategies – ie, market vs non-market objectives -affect the perception of the fishing accord; and finally a value of agricultural production (VPV), which is used to examine if people with diversified production strategies view the accords differently.

The regression results were acceptable, (Table 7.8) and showed that the presence of an environmental agent affected an individuals perception of the fishing accord positively. Wealthier families were slightly more likely to judge the fishing accords to work well, and those individuals who stated that fishing productivity had increased a lot were also more likely to see the accord as having worked well. The last result, coupled with the statistically insignificant result that those who judged the increase to be only a little, suggests that depending on the speed of recovery of the resource stock, it may take some time before the accords are seen as successful.

Table 7.6. Description of regression variables

Variable	Description
EAAC	The presence of an environmental agent in the community
VBCASA	Value of capital items in the house. Proxy for wealth
QPAM	Individual states that the fishing has increased a 'lot'
QPAP	Individual states that the fishing has increased a 'little'
PCON	Individual fishes for consumption only
VPV	Value of agricultural products. Proxy for other activities.

Table 7.7. Descriptive statistics for floodplain communities

Variable	Mean	St. Dev.	Min	Max	n=
EAAC	0.41	0.49	0	1	251
VBCASA	2,243	4,162	15	36,685	245
QPAM	0.57	0.50	0	1	223
QPAP	0.20	0.11	0	1	223
PCON	0.39	0.49	0	1	256
VPV	379	751	0	6,000	256

Table 7.8. Regression results (logit model) on whether community fishing accords 'work well'.

Variable	Coefficient Value	Marginal Effect	t-statistics (b/st.err)
Constant	-0.77	-0.18	1.8*
EAAC	0.56	0.13	1.7*
VBCASA	0.00	0.00	1.8*
QPAM	0.93	0.22	2.0**
QPAP	0.36	0.08	0.6
PCON	-0.21	-0.05	0.7
VPV	0.00	0.00	0.7
Number of Observations	210		
Log likelihood function	-131		
Restricted log likelihood	-139		
Chi squared	17.7		
Degrees of freedom	6		
Prob[ChiSqd > value] =	0.007		
Pct. Correct Predicted.	62		

*significant at 0.10, **significant at 0.05

8. SUMMARY AND CONCLUSIONS

The role of community associations in marginalized communities is key in their social and economic development. This study presents a tool that helps in the formation and working of community associations in forest frontiers in the Amazon. The tool is a formal logging contract, using established forest management methods, that allows smallholders to access the forest resource on their 80 percent legal reserves.

In this report we identify and describe a tool in use between a timber harvest operation and settlement communities. This tool is a system by which both the community and sub-contracted logger can benefit. This tool is currently in use in communities of the INCRA settlements Moju I and Moju II located on the BR 163 highway near the town on Santarem in the State of Para. These settlements contain approximately 1,600 families, of which approximately 700 are in some form of negotiation with the logging company in question. The value of this tool is demonstrated by an ever-increasing demand by the community members and associations to work with the logging company. The logging company that has developed this tool has harvested annual volumes from 2001 to 2003 of 25,000, 35,000 and 43,000 cubic meters, respectively. Of which, approximately 60 percent comes directly from the community lots.

Each lot is approximately 100 hectares, 20 percent of which can be deforested legally, and, if the colonist has a forest management plan, he/she is able to harvest timber from the remaining 80 hectares of "legal reserve". In this document we describe a tool for forest management that may provide a simple an effective means of allowing forest management in smallholder systems and link that process to the development and security of community association. This process works in the absence of government or donor funding. It is based on a commercial agreement between loggers and community association; it is the very absence of external support that increases its likelihood of sustainability.

So, the 'tool' in question is a formal logging contract between smallholders on the frontier and a logging company. In effect, the community is subcontracting the logging company to develop forest management plans and harvest timber legally; a job that the smallholder is otherwise incapable of under the present conditions. But the project described here is much more than that, it begins with the discussion of forest management and the potential benefits to the smallholder, then aids in the formation of a community association, and goes through to the final disbursement of funds after the timber has been harvested. Even after harvest, the company is responsible for maintenance of the main roads.

A survey of settlement communities – both that worked with this tool and those that did not - was conducted to assess whether this tool had any effect on the

quality of the community association. The results clearly show that those communities that had participated in the forest management project, and had seen harvest occur on their lands, judged their community association to be working well. However, families that had only heard about the tool (forest management), but had never seen it in action, or received the financial rewards, see their associations as ineffective and are uncertain about the benefits.

This bodes well for the replication of the tool, but with caveats. It is only after the harvest has occurred that the majority of community members will begin to believe in the project. Therefore it will be key to have a demonstration available, where community members can go and talk with other members and actually see forest management in action, and to quickly get past the first stages where uncertainly about the process and results generates confusion and distrust in the smallholders.

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ANNEX I.

**FORMAL LOGGING CONTRACT BETWEEN COMMUNITY
ASSOCIATION AND TIMBER HARVEST SUBCONTRACTOR
(In Portuguese)**

CONTRATO QUE, CELEBRAM, DE UM LADO, A EMPRESA NAME FO FIRM E DE OUTRO LADO A ASSOCIAÇÃO DE MORADORES E PRODUTORES FAMILIARES RURAIS DA COMUNIDADE NAME OF COMMUNITY ASSOCIATION, PARA A PRODUÇÃO DE MADEIRA EM TORA, NA ÁREA DE ASSENTAMENTO MOJÚ I E II, NA FORMA ABAIXO:

Aos 27 dias do mês de Abril de 2003, a NAME AND DESCRIPTION OF FIRM CONTRATADA neste ato representada pelo REPRESNTATIVE OF FIRM, e a NAME OF COMMUNITY ASSOCIATION doravante denominada CONTRATANTE, com sede na Rodovia Santarém-Cuiabá, Vicinal do KM 119 PA Mojú I e II neste ato representada pela sua representante legal a NAME OF PRESIDENTE OF COMMUNTY, celebra o presente contrato elaborado de acordo com a Instrução Normativa nr. 4º, 5º e 6º de 28 de dezembro de 1998, 15 de 31 de Agosto de 2001, Portaria do IBAMA nº. 48 de 1º. de Julho de 1995 e Lei no. 4.771 de 15 de Setembro de 1965 alterada pela Medida Provisória nº.1956-50 de Maio de 2000 e demais leis vigentes, mediante as seguintes cláusulas e condições.

As partes acima identificadas tem entre si, justo e acertado o presente contrato de propriedade rural para exploração de madeira, que se regerá pelas cláusulas seguintes e pelas condições descritas no presente contrato.

 CLÁUSULA PRIMEIRA DO OBJETO DO CONTRATO

1.1 -- Constitui objeto do presente Contrato, as espécies arbóreas identificadas nos lotes agrícolas aglutinados, localizados na comunidade NAME OF COMMUNITY, situada na Rodovia Santarém-Cuiabá Vicinal do Km 119 Assentamento Mojú I e II, situado no município de Santarém no estado do Pará, a serem extraídas em conformidade com o Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário e seus anexos elaborados para a exploração madeireira e demais documentos necessários, para um bom andamento deste Projeto.

CLÁUSULA SEGUNDA – DA ÁREA:

2.1 -- Nos lotes agrícolas, cada colono deve destinar 80% da sua área para a formação da Reserva legal de Floresta Tropical, que será utilizado para produção de madeiras em toras.

CLÁSULA TERCEIRA – DAS ESPÉCIES A SEREM EXPLORADAS:

3.1 -- As espécies a serem exploradas pela CONTRATADA são aquelas comerciais e potencialmente comerciais identificadas pelo Inventário Florestal e listadas no Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário, ambos elaborados e executados pela – NAME OF FIRM

CLÁUSULA QUARTA – DOS PRAZOS E CONDIÇÕES DE EXPLORAÇÃO:

4.1 – O prazo para a CONTRATADA realizar as atividades de Exploração Florestal, objeto do presente contrato, será de acordo com o tamanho da área dos lotes agrícolas pertencentes a NAME OF COMMUNITY ASSOCIATION.

4.1.1 – O prazo estipulado poderá ser prorrogado ou antecipado mediante entendimentos prévios entre ambas as partes, em decorrência do surgimento de situações à exploração, desde que devidamente comprovados e justificados e que não venham inviabilizar os objetivos básicos propostos no Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário.

4.2 – Durante a execução do Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário não será permitida, qualquer tipo de interferência de madeireiros "clandestinos". Entende-se por madeireiros "clandestinos" aqueles que exploram e transportam a madeira bruta de forma ilegal, ou seja, não atende a legislação vigente.

4.2.1 – Durante a execução do Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário, não será permitido o transporte de madeira bruta (tora) sem a autorização do representante da CONTRATADA.

4.3 – Para execução do Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário, serão obedecidas a Instrução Normativa 4, 5 e 6 de 8 de Dezembro de 1998, Portaria do IBAMA no. 48 de 1º. de Julho de 1995 e Lei n°. 4.771 de 15 de Setembro de 1965 alteradas pela Medida Provisória n°. 1956-50 de Maio de 2000 e demais leis ambientais vigentes.

CLÁUSULA QUINTA – DO PREÇO DA MADEIRA

A CONTRATADA pagará a CONTRATANTE, R$ 13,00 (Treze reais) pelo m³ ou R$ 52,00 (Cinqüenta e Dois reais) pela árvore a ser explorada.

CLÁUSULA SEXTA – DA FORMA DE PAGAMENTO

6.1 – O pagamento, relativo aos volumes das madeiras extraídas e empilhadas nos pátios durante o mês deverá ser efetuado pela CONTRATADA impreterivelmente, até 15 (quinze) dias corridos do mês subseqüente diretamente ao proprietário.

6.2 – As árvores serão conferidas, romaneadas e descontadas dez centímetros tanto na circunferência quanto no comprimento das mesmas, com exceção das espécies Jatobá e Jutaí, das quais serão descontados 20 centímetros na circunferência. Estas operações serão realizadas ainda nos pátios de arraste em seguida as árvores serão registradas em documentos. A árvore extraída por espécie será atestada pelo representante responsável da contratada e se constituirão em documentos hábeis para cálculo do valor do pagamento mensal a ser efetuado pela CONTRATADA, ficando cópia para o proprietário da respectiva propriedade rural.

6.3 – As parcelas mensais vencidas e não pagas serão acrescidas de atualização financeira, juros e multas de mora, em conformidade com o descrito a seguir:

6.3.l – Nos casos de atrasos de pagamentos o valor devido será atualizado financeiramente desde a data do vencimento até a data do efetivo pagamento, sendo que sobre o valor atualizado devido incidirão:

6.3.l.1 – Juros de mora de 1% (um por cento) ao mês calendário ou fração;

6.3.1.2 – Multa de mora de 5% (cinco por cento) sobre o valor atualizado do débito reduzido para 2% (dois por cento), se o pagamento for efetuado até o trigésimo dia após a data do seu vencimento.

CLÁUSULA SÉTIMA -CONTRATADA- DO REAJUSTAMENTO

7.1 - O preço da árvore, a ser pago para todas as espécies estabelecidas na CLÁUSULA QUINTA, será reajustado para mais ou para menos, de acordo com a variação ocorrida no período, pelo índice de preços por atacado (IPA) – Oferta global, coluna 45 (madeira), da Revista Conjuntura Econômica publicada pela Fundação Getúlio Vargas (FGV), vedada à periodicidade inferior 1(um) ano.
7.2 - Caberá a CONTRATADA efetuar os cálculos dos preços reajustados e apresentá-los aos pequenos proprietários da NAME OF COMMUNITY ASSOCIATION.

CLÁUSULA OITAVA – DAS OBRIGAÇÕES E RESPONSABILIDADES DA CONTRATADA

A CONTRATADA obriga-se e responsabiliza-se por:
8.1 – Empregar as técnicas florestais nas atividades de inventário florestal, derruba e extração estabelecidos no Plano de Manejo Florestal Sustentado Uso Múltiplo Comunitário, arcar com as despesas decorrentes das atividades pré-exploratórias, da derruba, traçamento, arraste, preparação e manutenção dos pátios de estocagem, abertura de trilhas, estradas, instalações físicas e outros pertinentes a execução da exploração.
8.2 – Dar manutenção nas estradas, pontilhões, bueiros, drenos e outras benfeitorias existente durante a execução dos trabalhos, assim como, construir estrada principal.
8.3 – Construir uma ponte no Rio Mojú no decorrer deste ano, onde a mesma dará acesso ao Travessão do Km 119. Cabe ressaltar que a CONTRATADA se responsabilizará com as despesas referente à mão de obra e a Associação com a matéria-prima.
8.4 – Caberá a contratada fornecer uma cópia do resumo do inventário florestal com o respectivo mapa de distribuição espacial das árvores referente a área de manejo florestal da propriedade rural.
8.5 – A CONTRATADA caberá no caso de substituição ou reagrupamento de mão-de-obra para complementar seu quatro de funcionários, dar prioridade à contratação de mão-de-obra onde será implantado o Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário. A mão-de-obra passará por um período de experiência, a ser definido pela CONTRATADA, podendo ou não ser contratado.
8.6 – Durante o período de experiência a mão-de-obra receberá orientação sobre técnicas florestais adequadas para realização das atividades. Com a contratação a mão-de-obra futuramente fará treinamento e reciclagem sobre técnicas de Manejo Florestal.

CLÁUSULA NONA – DAS OBRIGAÇÕES E RESPONSABILIDADES DA CONTRATANTE

O CONTRATANTE obriga-se e responsabiliza-se a:
9.1 – Acompanhar a execução do Plano de Manejo Florestal Sustentado de Uso Múltiplo Comunitário;
9.2 – Emitir documento, referente à madeira extraída durante o mês;
9.3 – Envidar esforços para superar problemas supervenientes à execução dos trabalhos, cuja solução esteja ao seu alcance, ou para o qual possa contribuir efetivamente;
9.4 – Não entrar na área de Manejo Florestal, com a finalidade de se produzir madeira em tora, antes de se completar o prazo determinado pela legislação para o segundo ciclo de corte (que atualmente é de vinte anos);

9.5 – Não permitir a entrada na área de manejo de caçadores e de qualquer madeireiro que transporte madeira na forma de toras ou em pranchas;

9.6 – Todo colono deve ser responsável pela organização e manutenção da associação,sendo que para tanto será criada uma "caixinha" onde todo associado deverá contribuir com no mínimo 10% (dez por cento) e no máximo 20% (vinte por cento) do valor adquirido com a venda da madeira de sua área para a aquisição de uma patrulha agrícola ou de qualquer outro maquinário que será de uso comum de todos os associados

9.7 – Não permitir que a madeira de desmatamento seja transportada por empresa que não seja a CONTRATADA, sem uma prévia comunicação e autorização por parte da CONTRATANTE junto a CONTRATADA;

9.8 – O colono deve estar ciente de que só receberá algum adiantamento (dinheiro), antes da retirada da madeira, para efeito de regularização de documentação da propriedade;

9.9 – A partir desta data, o próximo presidente eleito pela comunidade deve ser colono com participação ativa e interesse na resolução dos problemas da comunidade, bem como também tornar do conhecimento dos associados que a função de presidente deve ser voluntária, ou seja, sem fins lucrativos ficando portanto a CONTRATADA isenta da responsabilidade de fornecer remuneração e transporte para o presidente, mesmo estando este no exercício de suas atividades de presidente da associação faz-se necessário o cumprimento deste parágrafo para o melhor desempenho do projeto.

CLÁUSULA DÉCIMA – DA FISCALIZAÇÃO

Caberá a CONTRATANTE não permitir acesso ou qualquer transporte que carregue madeira bruta sem autorização do representante da CONTRATADA.

CLÁUSULA DÉCIMA PRIMEIRA – AS PENALIDADES

11.1-Pela inexecução parcial ou total das condições pactuadas, para exploração objeto deste contrato, garantida prévia defesa, ficará a CONTRATANTE e CONTRATADA sujeita às seguintes sanções:

11.1.1 – Advertência verbal e por escrito;

11.1.2 – Multa;

11.1.2.1 – Fica estipulada a título de multa percentual até dois por cento (2%) sob os valores efetivamente pagos pela CONTRATADA, relativos às madeiras extraídas, até a data da aplicação desta penalidade;

11.1.2.2 – A multa referida no subitem anterior deverá ser recolhido no prazo máximo de 10 (dez) dias corridos, a contar do recebimento da notificação formal da CONTRATANTE ou CONTRATADA, podendo ainda, se for o caso, ser cobrado judicialmente;

11.2 – As sanções previstas nos subitem 11.1.1 poderá ser aplicada juntamente com a do subitem 11.1.2, facultado a defesa prévia da CONTRATADA ou CONTRATANTE, no prazo de cinco (5) dias úteis;

11.3 – A multa prevista no subitem 11.1.2 não tem efeito compensatório e o seu pagamento não eximirá a CONTRATANTE ou CONTRATADA da responsabilidade de perdas e danos decorrente das infrações cometidas.

CLÁUSULA DÉCIMA SEGUNDA – DAS COMUNICAÇÕES

12.1 – As comunicações necessárias em razão deste contrato devem ser feitas por escrito e enviadas aos endereços da CONTRATANTE e da CONTRATADA.
12.2 Caberá a CONTRATANTE informar a CONTRATADA qualquer mudança decidida em assembléia.

<u>CLAÚSULA DÉCIMA TERCEIRA – DAS DISPOSIÇÕES FINAIS</u>

13.1 – As alterações contratuais que se fizerem necessárias serão formalizadas através de Termo Aditivo.
13.2 – Fica eleito o foro da Comarca de Santarém, para dirimir quaisquer dúvidas oriundas do presente contrato.

E, para firmeza e validade do que pelas partes ficou pactuado, firma-se o presente instrumento em 03 (três) vias de igual teor e forma, na presença das testemunhas que também o subscrevem.

CONTRATANTE: _____
Community association president

CONTRATADA: _____
Firm representative

TESTEMUNHAS:
1. _____
CPF:
2. _____
CPF:

ANNEX II

**FISHING ACCORD FOR THE REGION OF ITUQUI IN THE
MUNICIPALITY OF SANTARÉM**

PORTARIA Nº 20-N, DE 21 DE SETEMBRO DE 1999

O REPRESENTANTE DO INSTITUTO BRASILEIRO DO MEIO AMBIENTE E DOS RECURSOS NATURAIS RENOVÁVEIS - IBAMA, no estado do Pará, no uso das atribuições que lhe são conferidas pelas Portarias nº 139, de 09 de Abril de 1999; e nº 007, de 02 de fevereiro de 1996; e tendo em vista as disposições do Decreto-Lei nº 221, de 28 de fevereiro de 1967; e das Leis nº 7.679, de 23 de novembro de 1988, e nº 9.605, de 12 de fevereiro de 1998; e

Considerando a decisão das comunidades de Aracampina, Fé em Deus I, Fé em Deus II, Santana, Nova Vista, São José, Cabeceira do Marajá, Conceição, Santa Inês, São Benedito, São Raimundo, Santarém Miri, Paraná do Ituquí, Serra Grande, Patos do Ituquí e Pau D'Arco, e da Colônia de Pescadores Z-20 no município de Santarém/PA, conforme consta do processo nº 02001.003440/99-84, que estabelece o Acordo Comunitário para a conservação e preservação da região do Ituquí.

Considerando os pareceres técnicos do projeto IARA e do CEPNOR/IBAMA, e o parecer jurídico da Subprocuradoria/PA, constantes no mesmo processo;

Considerando, ainda, a necessidade de conservar os recursos pesqueiros locais e responder às reivindicações da sociedade organizada local, resolve:

Art. 1º - Estabelecer, anualmente, no período de 01 de outubro a 31 de janeiro proibições à pesca de malhadeira nos lagos da região do Ituquí.

 Parágrafo único - O período a que se refere este artigo, estende-se a todas as limitações à pesca determinadas nesta Portaria.

Art. 2º - Proibir a utilização dos seguintes petrechos de pesca:

I - malhadeira de qualquer natureza;

II - lanterna de carbureto.

Art. 3º - Permitir somente a pesca que utilize caniço, linha de mão, flecha e tarrafa, nos lagos da Ilha do Aracampina.

Parágrafo único - A captura de pescado nos lagos a que se refere o caput deste artigo, não poderá ser superior a 15 Kg (quinze quilos).

Art. 4º - Permitir a captura de até 100 Kg (cem quilos) de pescado por viagem de pesca.

Art. 5º - Proibir a captura, para comercialização, do acarí (Liposarcus pardalis).

Art. 6º - Suspender qualquer modalidade de pesca nos lagos Grandezinho, Pucuzinho de São Sebastião, Tioca, Pucu Grande.

Art. 7º - Permitir na ausência da fiscalização do IBAMA, que Agentes Ambientais Colaboradores, devidamente credenciados, lavrem Autos de Constatação, de acordo com as determinações da Resolução nº 03 do CONAMA, de 06 de março de 1988.

Parágrafo único - Toda e qualquer apreensão de material proveniente de infrações destas normas e demais leis e portarias, deverá ser realizada somente por fiscais do IBAMA.

Art. 8º - Em caso de alterações hidrológicas fora do normal (seca intensa ou cheia antecipada) o IBAMA tomará as medidas necessárias.

Art. 9º - Fica excluída das proibições previstas nesta Portaria, a pesca de caráter científico, devidamente autorizada pelo IBAMA.

Art. 10 - O exercício da pesca em desacordo com o estabelecido nesta Portaria sujeitará os infratores às penalidades previstas na Lei nº 9.605, de 12 de fevereiro de 1998, e demais legislação pertinente.

Art. 11 - Esta portaria entra em vigor na data de sua publicação.

Art. 12 - Revogam-se as disposições em contrário.

RICARDO SILVA FECURY
(Of. Rl. Nº 120/99)

PROPOSTA DE MODIFICAÇÃO DA PORTARIA Nº 20-N, DE 21 DE SETEMBRO DE 1999 (ACORDO DE PESCA DA REGIÃO DO ITUQUÍ)

A Região do Ituquí, localizada no município de Santarém, abrange várias áreas de pesca e é formada pelas seguintes comunidade: Aracampina, Fé em Deus I, Fé em Deus II, Santana, Nova Vista, São José, Cabeceira do Marajá, Conceição, Santa Inês, São Benedito, São Raimundo, Santarém Miri, Paraná do Ituquí, Serra Grande, Patos do Ituquí e Pau D'Arco.

A presente proposta foi concretizado a partir das discussões entre as comunidades para a avaliação da portaria em vigor desde setembro de 1999 e contou com a participação da Colônia de Pescadores Z-20 de Santarém, IPAM - Projeto Várzea e Pró-Várzea. As sugestões aqui apresentadas em negrito são resultado das várias reuniões de avaliação sendo que em anexo segui cópia da ata da última assembléia regional que aprovou tais modificações e lista de participantes.

Em Assembléia Regional, comunitários, pescadores e proprietários da região acordaram entre si o seguinte:

Art. 1º - Estabelecer, anualmente, no período de 01 de outubro a 31 de janeiro proibições à pesca de malhadeira nos lagos da região do Ituquí.

Parágrafo único - neste período a pesca será exercida com caniço, linha de mão, flecha, tarrafa e arpão nos lagos da região.

Art. 2º - Proibir por tempo indeterminado o uso da lanterna de carbureto como petrecho de pesca.

Art. 3º - Limitar, por tempo indeterminado, a captura em até 100 Kg (cem quilos) de pescado por viagem de pesca, sendo vedado o uso de utensílio para armazenamento dentro dos lagos, tais como, caixas e isopor.

Parágrafo único - A exceção ao caput deste artigo, no que se refere a quantidade de captura, se dá quanto aos lagos da Ilha do Aracampina, onde a captura não será superior a 15 Kg (quinze quilos) por viagem de pesca.

Art. 5º - Limitar, por tempo indeterminado, em até 300 m (trezentos metros) a soma das malhadeiras por embarcação de pesca, sendo que nenhuma poderá ter mais que 2 metros (dois metros) de altura e 150 metros (cento e cinquenta) de cumprimento.

Art. 5º - Proibir a captua, para comercialização do Acari (Liposarcus pardalis).

Art. 6º - Suspender qualquer modalidade de pesca nos lagos Grandezinho, Pucuzinho de São Sebastião, Tioca, Pucu Grande e Comprido.

Art. 7º - Em caso de alterações hidrológicas fora do normal (seca intensa ou cheia antecipada) o IBAMA tomará as medidas necessárias em parceria com as organizações da região.

Art. 8º - O exercício da pesca em desacordo com o estabelecido nesta Portaria sujeitará os infratores às penalidades previstas na Lei nº 9.605, de 12 de fevereiro de 1998, e demais legislação pertinente.

Art. 9º - Esta portaria entra em vigor na data de sua publicação.

Art. 10 - Revogam-se as disposições em contrário.

ANNEX III

SMALL HOLDER SURVEY INSTRUMENT FOR THE COMMUNITIES OF MOJU I AND II, IMPLEMENTED BETWEEN THE FEEDER ROADS AT 101 KM AND 140 KM OF THE BR 163 GOING SOUTH FROM SANTARÉM.

Small Holder Survey for the Communities of Moju I and II between Travessões 101 and 140 of the BR 163.

To be read before each interview

Estamos desenvolvendo pesquisas para avaliar o desenvolvimento das comunidades das áreas de assentamento do Moju I e II entre as vicinais dos kms 101 e 140 da BR 163 – Santarém Cuiabá. Estaremos aplicando um questionário perguntando detalhadamente sobre sua família, sua produção e sua renda. As respostas são confidenciais e você não será identificado de nenhuma maneira. Pedimos sua colaboração com respostas coerentes para que possamos produzir resultados que possam subsidiar no desenvolvimento da comunidade. Desde já agradecemos sua paciência e tempo em responder as nossas perguntas.

1.   Data: ____/____/____
2.   Entrevistado: _____
3.   Entrevistado: _____   M   F   Idade:_____ano(s)
4.   Comunidade: _____
5.   Vicinal #:   _____

DESCRIÇÃO DA FAMÍLIA

6.   Quais são os nomes e idade dos membros da família que moram no lote?

Nome	ID Idade	Masculino (M) Feminino (F)	Age Idade	Residence code
	1	M F		
	2	M F		
	3	M F		
	4	M F		
	5	M F		
	6	M F		
	7	M F		

	8	M F		
	9	M F		
	10	M F		

7.   Você e sua família moram no LOTE, na CIDADE, ou em uma AGROVILA?Outro _____ descrição.

8.   Que tipo de casa você tem no lote e / ou na agrovila**?**

         1. Poles and thatch (parede de pau com palha = tapiri)   A   L

         2. Mud walls and thatch (parede de barro com palha = taipa)   A   L

         3. Madeira com brasilite   A   L

         4. Madeira com cavaco   A   L

         5. Tijolo com paredes de madeira (não terminado)   A   L

         6. Tijolo com paredes madeira (terminado)   A   L

         7. Tijolo com telha (terminado)   A   L

         8. Tijolo com Brasilite (terminado)   A   L

         9. Tijolo com brasilite (não terminado)   A   L

         10. Tijolo no chão para iniciar construção.   A   L

         11. Mista:_____   A   L

9.   Quem construiu sua (s) casa(s)?

         1. Dono do lote

         2. Construtor indicado pelo INCRA

         3. Empresa Florestal

         4. Construtor indicado pela associação/INCRA

10.   Qual é a distância da sua casa aonde você mora até a água?   _____ metros.

11.   Quantas vezes por dia você tem que pegar água para consumo?   _____ vezes

12.   Quanto tempo você leva para cada viagem?   _____ horas

13.   Quando foi construída a estrada mais perto do seu lote?   _____ano(s)

DESCRIÇÃO E VALOR DO LOTE

14.   Você é dono do lote?   S   N

15.   Tamanho do lote   _____ha

6.   KM até BR 163

        Picada   _____m   km

	Ramal	_____m	km
	Est. Barro	_____m	km
	Piçarra	_____m	km

17. Quantas hectares estavam desmatadas ao adquirir o lote? _____ha
18. Quantas hectares estão desmatadas hoje? _____ha
19. Como você considera a área (declividade/aclividade) do lote1=pouco acidentado 2= médio   3=muito acidentado
20. Quantos anos você mora no lote? _____ano(s)
21. Como você adquiriu o lote?
    1. Comprou terra com titulo   R$_____
    2. Comprou benfeitorias   R$_____
    3. Assentamento   R$_____   recibido do INCRA
    4. Colonização   R$_____   recibido (do _____)
    5. Através da associação/INCRA   R$_____
22. Você conseguiu outro tipo de CRÉDITO?   S   N   Quanto _____R$
23. Você tem título definitivo do lote?   S   N
    SE SIM   (Se não vai até # 22 e 23)
24. Quanto é a parcela do pagamento?   _____R$/mês   _____R$/ano
25. Qual é o valor atual do seu lote?   _____R$
26. Você é dono ou você tem acesso a um:

Descrição	S N ✓	Dono- Valor R$/unidade	Aluga-Valor R$/unidade	Quanto pagou (R$)	Acesso Comum. R$/unidade	Por quanto Tempo	ANO
Caminhão							
Caminhonete							
Carro							
Carroça							
Casa de farinha							
Fubica							
Gerador							
Micro-sistema							

	Código	1. dia	2. meses	3. ano	4. hora	5. ha	6. carrada	7. saco/dia
Motocicleta								
Motor de sevar mandioca								
Motoserra								
Poço artesiano								
Trator								

COMUNIDADE

27. Existe uma associação na comunidade?   S   N
28. Quantas famílias existem na comunidade?   _____ famílias
29. Quando foi formada a associação?   _____ ano
30. Você participa da associação comunitária?   S   N
31. Quantas famílias participam da associação?   _____ famílias
32. Como você descreve o trabalho da associação comunitária?
       1.   parado   2.   razoável   3.   bom   4.   excelente
33. Tem escola na sua comunidade   S   N
34. Tem um(a) agente de saúde na sua comunidade?   S   N
35. Tem alguém que sabe ler e escrever na sua família (que mora no lote)? S   N
36. Tem alguém na sua família que estuda?   S   N
37. Onde? na cidade   na comunidade   em outra localidade
38. Quantos Km até a escola mais próxima?   _____Km(s)

PRODUÇÃO AGRÍCOLA

39. Qual foi o tamanho da sua roça no ano passado? _____ hectares   (tarefas 25mtsx25mts)

40. O que você produziu e vendeu da sua roça no ano passado?

Produção e vendas	Area plantada (Ha)	Volume produzido Ano passado	Vol. vendido Ano passado	Valor de venda por unidade	Unidade
Arroz					
Banana					
Café					
Farinha					
Farinha de tapioca					
Feijão					
Frutas					
Leite					
Macaxeira					
Milho					
Pimenta do reino					
Queijo					
Tucupi					

Código da unidade   **1 kg**   **2 saco**   **3 litro**   **4 indivíduos**

41. Onde você vendeu seus produtos?
   1. No lote
   2. Santarém
   3. Belterra
   4. Br. 163
   5. Outro _____Descrição
42. Como você transportou seus produtos?
   1. Ônibus
   2. Carroça
   3. Costa

4. Caminhão
5. Camionete
6. Bicicleta
7. Fubica
8. Outro _____Descrição

43. Quanto foi o custo do transporte? _____R$ por   Kg   Saco   Unidade
44. Quanto tempo leva para chegar no mercado? _____ horas
45. Você usa fertilizante?   S   N   Quanto _____Kg/_____   R$_____/Kg
46. Você usa agrotóxico?   S   N   Quanto _____Kg/_____   R$_____/Kg
47. Quantos animais você tem?

Código	numero	# vendido no ano passado	Valor da venda (total a unidade)	Valor atual

Animal código 1. Gado, 2. Carneiro, 3. Cabra, 4. Aves, 5. Porcos, 6. Cavalo

MÃO DE OBRA
48. Quantas horas por dia você trabalho na roça durante: VERÃO _____ horas /dia
     INVERNO _____ horas/dia
49. Você contrata mão de obra?   S   N   (se não vai até pergunta 55)
     SE SIM
50. Para qual atividade? _____
51. Em quais meses?   J F M A M J J A S O N D
52. Quantas pessoas? _____ pessoas
53. Quantos dias por mês? _____ dias/mes
54. Quanto você paga por diária? _____R$/dia

RENDA GERADA FORA DO LOTE
55. Você troca diárias?   S   N   (Se não vai até # 57)
56. Quantos dias por mês ?   VERÃO_____dias/mês
     INVERNO_____dias/mês

57. Você faz trabalho remunerado fora do lote ?   S   N
    SE SIM
58. Qual atividade?   Definição da outra explicação _____

Floresta	1
Pecuária	2
Mão de obra não qualificada (diarista)	3
Mão de obra qualificada	4
Outro	5

59 Quanto tempo você trabalha fora do lote durante o VERÃO _____ dias   meses dias/mes
60. Quanto tempo você trabalha fora do lote durante o INVERNO _____ dias   meses dias/mes
61. Quanto você ganha nesta atividade durante o VERAO _____R$ por DIA   MÊS   ANO
62. Quanto você ganha nesta atividade durante o INVERNO _____R$ por DIA   MÊS   ANO
63. Quantas outras pessoas contribuem para a renda familiar? _____pessoas
64. Quanto em dinheiro eles/elas contribuem por mês?NO VERÃO _____R$/mes
65. Quanto dinheiro eles/elas contribuem por mês? NO INVERNO _____R$/mes

CONSUMOS ADICIONAIS DA CASA
66. Quanto você gasta em compras na cidade?   _____R$/mes

PRODUÇÃO FLORESTAL
67. Você participa de um projeto de manejo comunitário?   S   N
68. Você sabe algo sobre manejo florestal?   S   N
    1. não conhece   2. ouviu falar   3. conhece mas ainda não participa   4. participa ativamente
69. Onde você aprendeu sobre manejo florestal?
    1.   família
    2.   no trabalho
    3.   governo
    4.   empresa florestal
    5.   compradores de madeira
    6.   vizinhos
    7.   associação da comunidade

70. Você sabe o VOLUME de Madeira do seu lote? S   N   Quanto_____ M^3, ARV. TOTAL
71. Você sabe o VALOR de Madeira do seu lote? S   N   Quanto_____R$/ M^3, ARV., TOTAL
72. Você já vendeu madeira?   S   N   (if N go to question 76)
73. Se SIM

ANO	Volume	Unidade.		Valor	Unidade	
		M^3	árvore		R$/$m^3$	R$/árvore
		M^3	árvore		R$/$m^3$	R$/árvore
		M^3	árvore		R$/$m^3$	R$/árvore
		M^3	árvore		R$/$m^3$	R$/árvore
		M^3	árvore		R$/$m^3$	R$/ árvore

74. Onde você vendeu a madeira?
        1. A pé (na propriedade)
        2. Na estrada
        3. No pátio do serraria
75. Que tipo de contrato você fez?
        1. Nenhum
        2. Contrato de manejo comunitário
        3. Manejo florestal individual
        3. Contrato de desmatamento com serraria
        4. Contrato de desmatamento com individuo
76. Você pretende vender Madeira no futuro?   S   N

NON-TIMBER FOREST PRODUCTS (EXTRATIVISMO)

77. Quais dos seguintes produtos você coleta da floresta?

Produto	Coleta ✓	Volume por coleta	UN	Valor/venda (R$)	Unidade	Afetado pela extração ✓
Açaí						
Andiroba						
Bacaba						

Breu						
Casca de Ipê						
Castanha do Brasil						
Cipó						
Copaíba						
Cumarú						
Leite de Amapá						
Leite de Mururé						
Mel de abelha						
Patauá						
Piquiá						
Plantas medicinais						
Sucuba						
Tucumã						
Uxi						

Código da unidade   1. kg   2. saco   3. litro   4. indivíduos   5. cacho

78.   Quantos DIAS POR MÊS você faz coleta destes produtos no   VERÃO   _____ dias/mes
                                                                                               INVERNO   _____ dias/mes

79.   Quantas horas você leva em cada viajem de coleta   _____ horas

80.   A venda de madeira de seu lote afeta a coleta desses produtos?   S   N

81.   Quais produtos foram mais afetados? **Marcar na tabela acima**

82.   Você caça?   S   N

83.   Quantos DIAS POR MÊS você caça no VERÃO   _____ dias/mes
                                                                     INVERNO   _____ dias/mes

84.   De 10 tentativas que você sai para caçar em quantas você consegue matar um animal?   _____ em 10

MUITO OBRIGADO (A) PELA SUA PACIÊNCIA E TEMPO PARA RESPONDER AS NOSSAS PERGUNTAS