AN ASSESSMENT OF INITIAL IMPACTS OF APPLYING A PAYMENTS FOR ENVIRONMENTAL SERVICES PROGRAMME ON FOREST PROTECTION AND LIVELIHOOD SECURITY

A CASE STUDY OF THE FOREST ALLOWANCE PROGRAMME IN THE JUMA SUSTAINABLE DEVELOPMENT RESERVE

STATE OF AMAZONAS, BRAZIL

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DECLARATION

We, Kerry Maria Agustsson, Anna Garibjana, and Elizabeth Cristina Soto Rojas, declare that this thesis is a result of our research investigations and findings. Sources of information other than our own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for an award of any type of academic degree.

Signature……..

Date…….....

Signature……..

Date…….....

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Date…….....

DEDICATION

To those who sometimes believed in me more than I believed in myself.

Anya

To those who have supported me and believed in me, and who have always encouraged me to continue.

Kerry

To my dear husband Even for all of his love, comprehension and support during all of this time.

Elizabeth

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ABSTRACT

The concerns related to global climate change have resulted in the formulation of new mechanisms concerning environmental governance. Payments for Environmental Services (PES) are one of these tools; however the implications of introducing such methods are not yet fully understood. In the context of REDD, Brazil has a lot of potential for the successful implementation of PES-based programmes. This has led to the creation of a PES-based project, the Forest Allowance Programme (BFP), which is currently operating in 14 protected areas in the Amazon State, under the management of the non-governmental Sustainable Amazonas Foundation (FAS).

The introduction of monetary incentives can alter local dynamics, and the implementation of the programme thus requires a thorough understanding of local institutional settings in order for the desired objectives to be achieved. Institutional theory regarding rationality and normative behaviour must also be taken into account, in order to avoid adverse outcomes.

The study area of the Juma Sustainable Development Reserve in the Amazon State was chosen as it is currently one of the sites of the implementation of the BFP, which is at present the only internationally certified project in Brazil aimed at rewarding the forest communities for protecting their resources. We looked at possible indicators, such as changes in agricultural practices, income level, awareness of the environmental protection, and others, which could reveal shifts in attitudes, motivation and behaviour resulting from the introduction of the programme. The field data was collected via household questionnaires with the residents of the reserve and interviews with programme facilitators, as well as by informal group discussions, and direct field observations.

The results reveal that the recent implementation of the BFP makes estimating the potential effects and costs of the project a challenge. Minor changes in behaviour and attitudes were observed, however the results could not be clearly attributed to the introduction of the programme and the financial incentives. The findings suggest that other incentives besides the monetary one, such as education efforts, are likely to have a stronger effect and will also be more long-lasting. The programme also seems to have a positive role in reinforcing the functioning of the reserve, through encouragement of monitoring and control among the participants, as well as through ensuring the continued presence of forest dwellers in the area, thus minimising the risk of external deforestation threats.

LIST OF ABBREVIATIONS AND ACRONYMS

ACA - The Amazonas State Association of Commerce (Associação Comercial do Amazonas)

AFEAM – the Development Agency of the Amazon State (Agência de Fomento do Estado do Amazonas)

BAU – Business as Usual

BFP – Forest Allowance Programme (Programa Bolsa Floresta)

BRL – Brazilian Real

CCBA - Climate Community & Biodiversity Alliance

CECLIMA - the State Centre for Climate Change (Centro Estadual de Mudanças Climáticas)

CER - Certified Emission Reduction

CEUC - the State Centre for Protected Areas (Centro Estadual de Unidades de Conservação)

CGE - The General Control Agency of the State of Amazonas (Controladoria Geral do Estado)

CIEAM - The Amazon State Centre of Industry (Centro da Indústria do Estado do Amazonas)

CNS – National Council of Rubber Tappers (Conselho Nacional dos Seringueiros)

COIAB - Coordination of Indigenous Organisations of the Brazilian Amazon (Coordenação das Organizações Indígenas da Amazônia Brasileira)

CO_2 - Carbon Dioxide

CPF – the Brazilian Personal Identification Number (Cadastro de Pessoas Físicas)

CPR - Common pool resource

ES - Environmental Service(s)

FAS - Amazonas Sustainable Foundation (Fundação Amazonas Sustentável)

FUNASA - National Health Foundation (Fundação Nacional de Saúde)

FVS - the Foundation for Health Surveillance (Fundação de Vigilância em Saúde)

GHG - Greenhouse Gases

GTA – Amazon Working Group (Grupo de Trabalho Amazonico)

IBAMA – the Brazilian Institute of Environment and Renewable Natural Resources (O Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis)

INCRA - the National Institute for Colonization and Agrarian Reform (Instituto Nacional de Colonização e Reforma Agrária)

INPA – the National Institute for Amazonian Research (O Instituto Nacional de Pesquisas da Amazônia)

INPE – the National Institute for Space Research (O Instituto Nacional de Pesquisas Espaciais)

IPAM - Institute for Environmental Research in the Amazon (O Instituto de Pesquisa Ambiental da Amazônia)

IPCC - Intergovernmental Panel on Climate Change

ITEAM - Amazonas Land Institute (Instituto de Terras do Amazonas)

KP - Kyoto Protocol

NOK – Norwegian Kroner

PES – Payments for Environmental Services

REDD - Reducing Emissions from Deforestation and Forest Degradation

RESEX - Extractivist Reserve (Reserva Extractivista)

RDS - Sustainable Development Reserve (Reserva de Desenvolvimento Sustentável)

RMIU - Rationality as Maximising Individual Utility

SDS – the State Secretariat of the Environment and Sustainable Development of Amazonas (Secretaria de Estado do Meio Ambiente e Desenvolvimento Sustentável)

SEDUC - the State of Amazonas Secretariat for Education and Teaching Quality (Secretaria de Estado de Educacão e Qualidade de Ensino)

SEUC - The State System for Conservation Units in the Amazon (o Sistema Estadual de Unidades de Conservação do Amazonas)

SNUC - National System of Protected Areas (Sistema Nacional de Unidades de Conservação)

UNFCCC - United Nations Framework Convention on Climate Change

USD – American Dollar

VCS - Voluntary Carbon Standard

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Chapter 1 Introduction

1.1 Global Deforestation Context

According to the Intergovernmental Panel on Climate Change (IPCC), deforestation is the second largest source of carbon dioxide (CO_2) as well as other greenhouse gas (GHG) emissions and one of the most significant drivers of climate change. The data from the IPCC reveals that emissions from deforestation and forest degradation in developing countries represent 17% of the total annual anthropogenic emissions (FAS 2008a; Intergovernmental Panel on Climate Change 2007). This estimate is higher than the quantity of GHG emissions that comes from the total world transportation sector, which total 14% (World Resources Institute 2006). Despite this fact, the regulation of emissions from deforestation and forest degradation in developing countries has not yet been covered by the Kyoto Protocol (KP).

Forests play a central function in climate change, and have therefore received increased international attention in climate negotiations. Addressing the issue of mitigation of GHG emissions on the global level is not an easy task; making policies, coordinating international agreements, designing monitoring policies, including law enforcement, and ensuring fair distribution of benefits are just some of the concerns related to this issue (Vatn, A., Vedeld, P., Petursson, J.G., Stenslie, E. 2009).

In Brazil, deforestation can account for up to 55% of national total emissions (mainly from the Amazon biome used for agriculture and livestock) – and contribute to an estimated 13 tons of CO_2 per capita. These numbers make Brazil the fourth largest GHG emitter in the world[1] (Brazilian Intergovernmental Collaboration. 2009).

Reduced deforestation could positively influence biodiversity conservation. The reduction of CO_2 emissions from deforestation could also have a significant impact on the livelihoods of local and marginalized people, which are the ones who depend more on the forest resources on a daily basis. These issues need to be kept in mind when making policies towards the reduction of forest emissions, in order to avoid adverse effects on livelihoods and biodiversity.

[1] These numbers are based on including emissions from deforestation in GHG calculations. Usually GHG emission calculations do not include emissions from deforestation and forest degradation, in which case Brazil ranks no. 17 (FAS 2008b)

1.2 Reducing Emissions from Deforestation and Forest Degradation (REDD)

REDD has recently emerged as a climate mitigation measure that could potentially reduce CO_2 emissions, if included into the global climate regulation regime (Angelsen 2008). REDD consists of actions and measures to reduce emissions from deforestation and forest degradation by focusing on rewarding individuals, communities, projects and countries for reducing their forest emissions. The economic transfers are often done from firms or industrialised countries to developing countries, in order to neutralize the emissions produced by their industrial sector, through supporting projects aimed at reducing GHG emissions from forest activities. Thus REDD initiatives have been seen as a win-win scenario because the economic transfers from North to South can improve structures of governance, which in turn can benefit and help the poor and also can give other environmental earnings in addition to the climate related benefits (Angelsen 2008). Forests owners or inhabitants could be paid to implement REDD activities. Though REDD programmes offer a new perception of deforestation issues, they also face the possible divergences between carbon mitigation, biodiversity preservation and livelihood aspects (Vatn, A., Vedeld, P., Petursson, J.G., Stenslie, E. 2009).

The outcomes of such programmes are not fully experienced yet as REDD initiatives are relatively new and there are few REDD projects that are in practice today. If REDD projects are carried out without acknowledging the local institutional context, they can generate negative consequences for the poorest and the most powerless actors (Angelsen 2008)

The World Bank, the United Nations, and others parties are engaged in developing processes to finance potential REDD projects. The Norwegian government has already created a fund for future REDD projects with a sum of roughly USD 2.5 billion (NOK 15 billion), and according to a Stern report from 2006, forest projects have the potential to be among the cheaper options of mitigation activities (Stern 2006). This has resulted in increased interest in REDD (Vatn, A., Vedeld, P., Petursson, J.G., Stenslie, E. 2009).

While aiming to address emissions from forest degradation and other environmental problems, market based tools have also been recognised for having the potential of creating new ways of producing income to improve life quality. This leads us to the concept of Payments for Environmental Services.

1.3 Payments for Environmental Services (PES)

Ecosystems and the diverse environmental services they provide are important to sustain life. The environmental services provided by forests such as watershed protection, biodiversity conservation, atmospheric regulation (including GHG mitigation), and landscape beauty are essential for humanity. However, due to the complex nature of environmental goods, assigning them a price is a challenging task (Engel et al. 2008)

PES is an emerging environmental governance tool which can transform external, non-market values of the environment into financial incentives for local actors to supply environmental services (ES) (Engel et al. 2008). PES is focused on the principle that beneficiaries of ES could make payments to resource managers for adopting and implementing practices to restore and preserve ecosystems. Even though the theory of PES was developed almost two decades ago, the implementation of this market-based tool for managing natural resources is quite new (Hall 2008; Kosoy et al. 2007).

1.4 Opportunities for REDD and PES Schemes in Brazil

Brazil has about 1/3 of the global tropical forests, and it has been projected that 40% of the country's rainforest may be destroyed by 2050 (Mitchell 2007). The global environmental services provided by the Brazilian Amazon forest are immense; therefore calculating their economic value is a hard task. However, it has been estimated that PES could generate between USD 500 million and USD 2.5 billion a year in revenues, which could be used for conservation purposes. At the moment, farmers in the Amazon destroy rainforest, receiving in return USD 200 per hectare in profits from agriculture and sale of timber, releasing an average of 500 tons of CO_2 per hectare. Meanwhile, the same area could yield a profit of USD 8,000 through avoided deforestation, based on the European Union price of USD 16[2] per ton of CO_{2e}[3]. Even lower prices of carbon payments can provide a potential incentive for farmers to preserve and protect forest (Hall 2008; International Institute for Evironment and Development 2009a).

[2] Based on the EU Emission Trading Scheme price, as of March 2009

[3] CO_{2e} (equivalent) is the quantity of a given mixture of GHGs that has the same effect on the atmosphere as one metric ton of CO_2.

REDD projects give the possibility to value environmental services provided by the Amazon rainforest. At the moment Brazil is an experimental arena for the design and implementation of a PES project called the Forest Allowance Programme (O Programa Bolsa Floresta - BFP). The BFP is run by a Brazilian NGO, the Amazonas Sustainable Foundation (Fundação Amazonas Sustentável - FAS), in among others the Juma Sustainable Development Reserve[4] in the State of Amazonas, where this study is focused. The BFP pays local communities for their contribution to conservation. This project is a validated REDD project which hopes to save up to 190 million tons of CO_{2e} through avoided deforestation in the project crediting area in the Juma reserve[5], which would have been released under the business as usual (BAU) scenario by 2050 (FAS 2010b), and is the first Brazilian project that pays the members of local communities to protect the forest where they live.

1.5 Research Objective and Justification

This study will focus on the initial impacts that the BFP has had so far on local forest dwellers in the Juma Sustainable Development Reserve in Amazonas, and the effects on deforestation practices and livelihoods of the rural poor. This project has also been recognized as the first REDD project in Brazil to fulfil the Climate Community & Biodiversity Alliance (CCBA)[6] standard. It has also been confirmed by the international certification organisation TÜV SÜD and has also passed the test of the Voluntary Carbon Standard (VCS) Programme[7] (International Institute for Evironment and Development 2009b).

To our knowledge there have been no formal studies to determine the possible costs and benefits both at the organisational level and at the local level, and possible outcomes that the programme has had so far on the residents of the Juma reserve and on deforestation patterns.

[4] Sustainable Development Reserve is a reserve category that allows sustainable harvesting of resources by the residents in order to promote development of the communities residing within the reserve, with biodiversity conservation as a secondary objective (Rylands, 2005).

[5] The project crediting does not include territories affected by traditional land use practices by the communities in the reserve, as well as some titled land areas located within the reserve. The measurement of saved emissions is based on an audit carried out by the international certification organisation TÜV SÜD for CCBA (International Institute for Evironment and Development 2009a).

[6] The CCBA is a partnership among research institutions, corporations and NGOs, which has developed voluntary standards to help design and identify land management activities that minimize climate change, support sustainable development and conserve biodiversity (Climate Community and Biodiversity Alliance. 2008)

[7] The VCS Programme is another approval standard which guarantees benefits from voluntary carbon offset projects (The Voluntary Carbon Standard. 2008)

Injecting funds into communities, which are the villages where the residents of the reserve live, could improve livelihoods, but distributional effects are unknown, and local conditions will influence how these payment schemes work. The question about how residents and local communities may react to the implementation of the BFP is a central concern. Very little is known about issues related to the design of such programmes, and the following changes in behaviour and attitudes among service providers towards the resource. Providing this information may be useful to better understand the social implications, efficiency issues, and possible outcomes of future market-based mechanisms focused on forest protection. We hope to provide valuable data for further research in this area, and thus contribute in the direction of improving REDD architecture.

1.6 Problem Statement and Research Questions

In this project we would like to conduct a case study of the BFP in the Juma reserve in order to evaluate the potential effects and costs of introducing this PES-based programme to the forest dwellers residing within the reserve. First, we will address how the programme was designed and how it is organised in order to distribute resources, and we will look at the costs of implementing the BFP both for the facilitators and the participants. We are interested in looking at how the introduction of the BFP affects peoples' motivation, their behaviour towards forest management, and how their attitudes towards the resources may have changed. We also want to address how the establishment of the new rules which regulate forest use, along with new development opportunities shape the communities and influence individual livelihoods. We would also like to assess the relation between the Juma reserve and the BFP in terms of enforcing rules and the subsequent effects on behaviour. The process of environmental education of local communities through project participation is of great interest, as education is one of the main co-benefits of the programme. Finally, we would like to establish how the programme is perceived by the residents of Juma reserve. On the basis of this, we have devised the following research questions:

OPERATIONAL ISSUES

1. How has the BFP programme been introduced into Juma over time?

a. What is the functional relationship between the Juma reserve and the BFP?
b. How were the local residents of Juma involved during the establishment of the BFP?

2. How is the BFP programme designed concerning the distribution of the resources from the main donor to the recipients?
   a. What is the distribution scheme for the BFP?
   b. Who is the main decision-maker and responsibility-bearer in designing the programme and distributing the resources; the donor (Marriott) or the intermediary (FAS)?
   c. What was the role of the local communities in the Juma reserve in designing the distribution of the resources?
   d. Were the methods of payment calculation based on opportunity costs?

3. Are the rules of the BFP followed?
   a. What control mechanisms do FAS have?
   b. What role do local communities play in the monitoring and control of the BFP rules?

IMPACT OF THE BFP ON LIVELIHOODS, BEHAVIOUR AND ATTITUDES

4. Has the implementation of the BFP had any impact on behaviour in relation to agricultural practices and forest product harvesting?
   a. Is the deforestation rate decreasing?
   b. Has the BFP as a whole changed behaviour in relation to the residents' role in protecting the forest?
   c. Have the rules had any effect on income?

5. Has the introduction of the BFP affected attitudes towards the forest?
   a. Is the perception of the residents concerning forest resources changing?
   b. What is the effect of the payments on attitudes?

6. What role does the interaction between the reserve and the BFP play in changing the attitudes and the behaviour on the ground?

7.How are the resources provided by the BFP used by the recipients?

a.What are the material benefits and improvements of livelihood security for individual households?

b.What are the education and healthcare benefits?

c.What are the new business opportunities provided by the BFP?

8.How effective is the BFP in terms of educating communities about the importance of the forest?

a.Have the education efforts had an effect on the attitudes of the residents towards their resources? Do they see the forest for its use-value only, or do other intrinsic values matter?

b.To what degree are the residents participating in the BFP?

TRANSACTION COSTS FOR THE BFP

9.What are the transaction costs of maintaining the project, both for the organization as well as for individual households?

a.What were the costs of establishment of the BFP in Juma for FAS?

b.What are the costs of maintaining the BFP in Juma for FAS?

c.What are the costs of participation for individual households?

SATISFACTION OF PARTICIPANTS WITH THE BFP

10.What is the attitude of the reserve dwellers towards the BFP?

a.Do they consider the benefits sufficient enough to follow the rules of the BFP?

b.How satisfied are they with the programme?

1.7 Thesis Delimitations and Structure

This study focuses mainly on the effects of the BFP on motivation, attitudes and behaviour, as well as information related to these issues, such as participation, and the design and organisation of the programme. We have partially incorporated a livelihood analysis approach, in order to facilitate the assessment of the potential impact of the BFP on income, yet the limited data we could access did not allow for utilising this approach to the full extent, and this in addition was beyond the scope of this thesis from the very beginning. In order to better understand the general effect of the BFP, we focused our study on those participating, regardless of differentiating social factors such as gender, age, education levels, or other aspects.

The structure of the thesis is as follows: Chapter Two contains background information on deforestation trends in Brazil, a presentation of the Forest Allowance Programme (BFP) and FAS, which is responsible for running the BFP. Chapter Three covers theory on institutions, behaviour and PES. Chapter Four covers the methods applied to collect the data, and Chapter Five contains the data analysis. Chapter Six covers the discussion of our findings, and Chapter Seven contains conclusions based on our findings for the BFP programme in Juma. Appendices can be found after Chapter Seven.

Chapter 2 Background Information

2.1 The State of Amazonas

The State of Amazonas is the largest state in the Brazilian Amazon, an area which also includes Pará, Mato Grosso, Maranhão, Rondônia, Tocantins, Acre, Roraima and Amapá. It covers over 1.5 million km² and is also the biggest state in Brazil (see Figure 1 below). The state's territory is primarily represented by tropical rainforest, is scarcely populated and remains relatively unreachable. The region is for the most part only accessible via air and waterways. Further expansion and improvement of several already-existing federal highways cutting through the state are however given high priority in the country's development ambitions. The capital and the biggest city of the Amazon State is Manaus, which is a major port and industrial centre of the region. In 2009 the population has been registered at 1.738.641 people. The city continues expanding due to natural population growth trends, as well as the influx of rural residents (City of Manaus 2010).

One of the notable characteristics distinguishing the State of Amazonas from other Brazilian states is the high share of land set aside as protected territories - indigenous reserves and numerous conservation units (State of Amazonas. 2010). The establishment and coordination of the protected territories is a cooperative effort of multiple agencies. Their roles are distributed as follows: The State Secretariat of the Environment and Sustainable Development of Amazonas – SDS – is the main government body, responsible for all environmental and development matters of the region. It regulates the creation and functioning of the protected areas through its two sub-organs – the State Centre for Protected Areas (Centro Estadual de Unidades de Conservação, CEUC) and the State Centre for Climate Change (Centro Estadual de Mudanças Climáticas, CECLIMA) whose primary function is linked to the implementation of state policies related to climate change. CEUC's work has resulted in increase of state protected territories by more than ten million hectares through the creation of 20 more new units during the past decade. Their creation and functioning have been supported by the unified system for federal, state and municipal parks - the National System of Protected Areas (Sistema Nacional de Unidades de Conservação, SNUC), which was endorsed in 2000 (FAS 2008a).

Figure 1: Map of Brazil showing all states.

Source: http://www.dholmes.com/master-list/brasil.gif

Partly owing to the efforts mentioned above, as well as to the remoteness of the region, the State of Amazonas has over the years demonstrated the lowest deforestation rate among other states of the Brazilian Amazon. Up to this day, an impressive 98% of the original forest cover remains untouched. About 0.4% of the total forest cover has been lost within the Amazon State during the period between the years 2000 and 2007. The entire region, on the other hand, has lost 3.7% of its forest during the same period. However this relatively slow trend of deforestation in the Amazon State may change under the pressure of increased migration to

the area from other states, where land conflicts and resource depletion are taking their toll (FAS 2008a).

2.2 Deforestation Trends

An impressive number of protected areas have been established in Brazil for the past two decades. Despite these efforts, the deforestation threat remains high both due to various socio-economic factors as well as conflicting political and financial interests (Rylands 2005). It is claimed that only 10% of the deforestation that occurred in the Amazon region for past the few years was conducted in accordance with the legal regulations (FAS 2008a)

There are numerous explanations to this continuous trend. Some blame the macroeconomic factors: Hall (2008) and Börner and Wunder (2008) argue that increasing food prices and demand for biofuels are creating more motives for land speculation and agricultural expansion, leading to more forest clearing. Infrastructure development pressures also play a part in the trend (Fearnside 2008b). In addition, land tenure insecurity is considered by some as one of the main causes of deforestation (Puppim de Oliveira 2008). Araujo et al. (2009:6) describe the process of deforestation as "the result of strategic interactions between landowners and squatters who compete for land access and attempt to legitimate their ownership" owing to the fact that the Brazilian Constitution allows relocation of land rights from legal owners to squatters if land is not used 'productively' according to the National Institute's for Colonization and Agrarian Reform (INCRA - Instituto Nacional de Colonização e Reforma Agrária)[8] definition.[9] Fearnside (2008b) supports this position by pointing out that title granting of untitled (public) lands is more likely to occur if the land user can show that "improvements" have been made to the land, which leaves no choice for title seekers but to deforest.[10]

[8] INCRA is a federal government agency that administers agrarian issues, such as the economic exploitation of rural property (National Institute for Colonization and Agrarian Reform. 2008).

[9] The concept of "productivity" is not well defined. However de facto, forested areas are viewed as unproductive, unlike cleared territories used for agricultural and pastoralist activities. The fact that the supreme state law permits such uncertainty undermines the very essence of property rights. The owner in this case is no more secure and legally protected than any land grabber.

[10] Lack of unified national cadastral registry and tremendously exhausting process of acquiring land titles also adds to property rights insecurity in the Brazilian Amazon. The offices are often located too far away and are not easily accessible for far residing applicants. De facto ownership may last for years before the actual title is

Contradictory environmental regulations and the weak law enforcing capacity of the respective organisations exacerbate the situation. Even though the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA - O Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis)[11] demands that a considerable part of private property should be kept as standing forest, the institute seems to have little control in the Amazon region due to staff shortages and high level of corruption among IBAMA personnel (Hall 2008; Puppim de Oliveira 2008). In addition, subsidies for agricultural expansion also provide incentives for landless peasants to occupy land and initiate farmland activities hoping to meet the requirements for government support (Fearnside 2008b; Puppim de Oliveira 2008).

These trends have been strongly present in the Brazilian Amazon and threaten to spill over to the areas where the forest cover remains largely intact once the resources are depleted at the current locations of intensive deforestation. However, the State of Amazonas still has a potential to maintain its rate of deforestation at a relatively low level. In order to reinforce the existence of the protected areas by providing better life conditions and financial compensations to the forest dwellers residing within them, the state government has initiated the Forest Allowance Programme (O Programa Bolsa Floresta - BFP).

2.3 The Creation of the Juma Sustainable Development Reserve

The Juma Sustainable Development Reserve was created on 3rd of June 2006, when it was legally recognised with the endorsement of Decree no. 26.10. The creation and operation of the reserve follows the guidelines of the national and state systems of protected areas; the administrative head of the reserve is appointed by CEUC/ SDS. The reserve area includes 589,613 hectares with 25 communities situated within its borders, and 19 more located on the frontiers, which all use the resources within the territory of the reserve, totalling 1646 people among the 44 communities (FAS 2010a).

obtained, making land users vulnerable to attacks from other land grabbers. In addition, plot boundaries are not well defined and cases of double-entry titling are also common.

[11] IBAMA is largely responsible for environmental management in Brazil, and was created in 1989. Issues such as environmental protection, reducing deforestation, monitoring, and establishing research centres fall under their jurisdiction (Brazilian Institute of Environment and Renewable Natural Resources. 2008).

A year prior to the reserve creation, a week-long fieldwork was carried out in the region of the river Aripuanã by the joint team of representatives from various government organisations and bodies. Among them were SDS, IPAM – the Institute for Environmental Research in the Amazon (O Instituto de Pesquisa Ambiental da Amazônia)[12], ITEAM – the Amazonas Land Institute (Instituto de Terras do Amazonas)[13], INPA – the National Institute for Amazonian Research (O Instituto Nacional de Pesquisas da Amazônia)[14] and others in order to evaluate the potential for creating a conservation unit in the area. The proposal then was announced to the public, and a series of discussions took place in the community of Tucunaré, a community located in the Juma reserve, and in Novo Aripuanã, the town closest to the Juma reserve and located on the river Aripuanã. During these discussions, 100% and 95% of the participants of the meetings voted in favour of the reserve creation, respectively (FAS 2010a).

The use of resources within the reserve is regulated by the Reserve Management Plan. This management plan is based on detailed appraisal of fishing activities and inventory of forest resources, which was initiated in the region in autumn 2009, and lasted until early 2010[15]. The mapping of resource uses in the communities drafted by the FAS team served as a basis for Juma zoning regulations. Prior to their finalization, the zoning regulations have been discussed during a three day participatory planning assembly which took place in the town of Novo Aripuanã. It gathered together community presidents of the entire reserve as well as representatives of FAS and various state bodies. The Management Plan was finalized and released in March 2010 (FAS 2010a).

[12] IPAM is an environmental NGO, founded in 1995, and has the objective of determining the ecological, economic and social consequences of development in the Amazon region. IPAM works with the implementation of programmes for scientific and technological research and training of scientists, and educators (Institute for Environmental Research in the Amazon. 2010)

[13] ITEAM was created in 2003, and coordinates and controls the execution of state policies in relation to agrarian reform, as well as the regulation of legitimate occupants of public land and other issues of development in agrarian, agro-extractive, and agro-forestry areas (Amazonas Land Institute. 2007)

[14] INPA was created in 1952, and conducts studies and research of the physical environment and living conditions to promote human welfare and socio-economic development in the Amazon region, with focus on expanding the sustainable use of natural resources in the Amazon (National Institute for Amazonian Research. 2002)

[15] We wish to point out that the Management Plan thus is not complete and is not currently carried out to its full potential. However, certain aspects have been covered, and have resulted in rules regarding, for example, zoning of forest product harvesting.

2.4 The Forest Allowance Programme (BFP)

The Forest Allowance Programme is the first internationally certified programme in Brazil aimed at rewarding the communities living in the Amazon for protecting the forest. The programme is based on payments for environmental services disbursed directly to the forest dwellers; however the focus of the BFP is not limited to financial benefits alone. The programme has a wide scope of activities, and is based on four distinct components, designed to improve the quality of life of the forest communities and to reinforce environmental protection by promoting sustainable practices and facilitating the access to health services and education (FAS 2008a).

The programme has been conceived by the Amazon State. Prior to the programme's final formulation, an elaborate discussion took place among different stakeholders: the State, various socio-economic movements, including some indigenous associations and members of the Alliance of the Forest People (Alliança dos Povos da Floresta). The validation of the programme was realised through the creation of the new state laws: Law no.3.135 on Climate Change, Environmental Conservation and Sustainable Development of the Sate of Amazonas (Lei 3.135, sobre Mudanças Climáticas, Conservação Ambiental e Desenvolvimento Sustentável do Amazonas) and Complementary Law no.53 on the Sate System of Conservation Units (Lei Complementar 53, sobre o SEUC –O Sistema Estadual de Unidades de Conservação do Amazonas/ The State System for Conservation Units in the Amazon) in June 2007. The first law formulated the legal basis of the programme, and the second helped to delineate the concept of environmental services. Both laws seek to consolidate the legal environment of the Amazon State in order to structure the economy of forest-based environmental products and services and promote social justice and environmental conservation (FAS 2008a; pers. mess. Pinto 2009; pers. mess. Viana 2009).

As a state initiative the BFP had initially been managed by the State Secretariat of the Environment and Sustainable Development of Amazonas, but was soon made the responsibility of the specially created Sustainable Amazonas Foundation (Fundação Amazonas Sustentável, FAS) – a non-profit public organization whose main goal is to manage the environmental products and services from the state conservation units and operate the BFP (FAS 2008a; pers. mess. Pinto 2009; pers. mess. Viana 2009). The structure and the concept of FAS will be introduced later.

The programme is funded by three main donors: the Amazon State, Bradesco Bank[16] and the Coca-Cola Corporation. Each of them has made a one-time contribution of BRL 20 million (roughly USD 10 million)[17], which are allocated to the permanent fund, interest from which is used to cover only the monthly payments to forest dwellers under one of the components of the BFP (all of which will be introduced shortly). The other components of the BFP are funded by additional support from Bradesco Bank. The facilitator of the BFP, FAS, is the main decision-maker in relation to allocations to the different elements of the programme. However FAS have no right to use the principal endowment amount, and may only decide on the allocation of the 5% interest generated by the endowment fund (pers. mess. Pinto 2009; pers. mess. Viana 2009).

The resources are currently divided between the 14 conservation units managed by the foundation, with the total of 6802 families registered as eligible for the participation in the programme: Floresta Maués (653 families), Sustainable Development Reserve (Reserva de Desinvolvimento Sustentável, RDS) Amanã (491 families), RDS Canumã (114 families), RDS Cujubim (37 families), RDS Mamirauá (2169 families), RDS Piagaçu-Purus (579 families), RDS Rio Amapá (266 families), RDS Rio Madeira (710 families), RDS Rio Negro (465 families), RDS Uacari (238 families), RDS Uatumã (364 families), Extractivist Reserve (Reserva Extractivista, RESEX) Catuá Ipixuna (221 families), RESEX Rio Gregório (117 families), and RDS do Juma (378 families).

The Juma Sustainable Development Reserve is currently the only unit eligible for trading carbon credits produced through avoided deforestation on its territory. Juma's REDD perspective has attracted an additional donor, Marriott International – an international hotel chain based in the U.S.A, who is financing the implementation of the BFP specifically in this reserve and has pledged to invest USD 500,000 per year for four years from 2008 to 2011. The funds are expected to be collected through voluntary donations by Marriott's customers. The carbon credits generated through the avoided deforestation on the territory of the Juma reserve will belong to FAS and will be sold to Marriott International. Through this relationship, the donor intends to establish a mechanism to compensate carbon emissions produced by the chain's guests (FAS 2008a; FAS 2010b).

[16] The Bradesco Bank is one of Brazil's largest private banks (Bradesco)
[17] Exchange rate of USD 1 = BRL 2

2.5 The BFP Components

The monetary allowance, which is paid to the members of the forest communities and through which their role as forest guardians is explicitly recognised, may appear as the most obvious rationale of the programme. However the programme is not limited only to the distribution of financial resources to the forest dwellers. It has an objective to increase the environmental awareness among the inhabitants of the local communities and improve their livelihood strategies in such a way that would support environmental protection in the area. The BFP has also established a long term agenda and will focus on the following aspects: support of sustainable production through commercialisation of productive chains, improvements of standards in health and education, monitoring and control of deforestation and management of the state conservation units, where collaboration between the state, non-governmental organisations and forest communities will be given a central place.

One of the objectives of the programme is forest conservation; yet this does not imply that the well-being of the local communities should be sacrificed for this goal. The programme intends to protect the forest not through restricting the agricultural production within the communities, but by improving the methods of cultivation which would allow yielding sufficient crops without expanding the cultivation area. Through its activities, the programme also aims to encourage people to stay in the area, to create better opportunities for them. Permanent presence of the local communities in the reserve ensures a better control of external invasions. Keeping these concerns in mind, the BFP has been designed with four core components, which are expected to interact together to achieve the desirable outcomes (FAS 2008a; FAS 2010b; pers. mess. Pinto 2009; pers. mess. Viana 2009).

2.5.1 The Family Component (Bolsa Floresta Familiar)

The Family component consists of a sum of BRL 50 (equivalent to roughly USD 25) paid on a monthly basis to the mothers of the families. Widowers and single men who have a separate household are also entitled to the payment. The payment is expected to encourage participation and understanding of the overall objective of the programme, and together with other components, create a feeling that people can maintain family life in this area and live off the forest. The payment is proposed as recognition and compensation for the services that these families provide in the forest during their lives. This payment component was the first

one to start in all the participating state conservation units. The other three, introduced below, are in their preparatory stage (FAS 2010b; pers. mess. Pinto 2009).

2.5.2 The Association Component (Bolsa Floresta Associação)

The Association component is designed to support the forest dwellers on the community level and strengthen community-based organisations and their capacity to co-manage the programme. The programme contribution into this component is equivalent to 10% of the total annual amount of the Family component in the reserve. Each conservation unit must have a residents' association (Conservation Unit Association of Dwellers) where communal issues are assessed. The support is not given directly as a money transfer, but instead is invested into equipment necessary for the functioning of the organization (FAS 2010b; pers. mess. Pinto 2009; Viana, V. 2008).

2.5.3 The Income Component (Bolsa Floresta Renda)

The Income component is expected to contribute an average of BRL 4000 (about USD 2000) per year per community depending on the number of families. The Income component is designed to facilitate sustainable production which would help generate additional income for the forest dwellers without engaging in illegal activities such as deforesting or harvesting other protected products. Activities eligible for this support are seed and nut collection and processing, production of honey and fish, harvesting of fruits and vegetable oils, etc. The financial resources are channelled into technical support and activities which will educate the community members about sustainable use of resources and inform them about market conditions. The funding is provided as a direct investment by the facilitator into relevant activities and equipment. The facilitators of the programme suggest available options, but all projects (in line with the programme rules and objectives) must be proposed, discussed and approved by the community members The Income component is expected to offer real opportunities to improve the financial situation within the communities, and offset any possible motivation to continue with the unsustainable income generating activities among community members (FAS 2010b; Viana, V. 2008).

2.5.4 The Social Component (Bolsa Floresta Social)

Each community is entitled to an annual average direct investment of BRL 4000 (USD 2000) into education, health, communications and transportation. The Social component of the programme, conducted in partnership with the responsible government organisations and institutes, aims to reinforce citizen rights of the forest dwellers. The construction of schools and health stations and provision of emergency transportation has been financed under the Social component, while the operation of the facilities is supported by the state, as it is the state's direct responsibility. For example, the teaching staff for the schools is provided by the State of Amazonas Secretariat for Education and Teaching Quality, while the curriculum has been designed in cooperation with FAS' expertise (FAS 2010b; pers. mess. Pinto 2009).

2.5.5 Programme Rules and Requirements

There are some prerequisites to be eligible for the programme, although participation is voluntary. All participants must have a proof of residence within the given state conservation unit for at least two years, a taxpayer number and a personal identification in order to be eligible for the programme. Each applicant family must attend the general information meeting, which provides an introduction to the programme and a general overview of environmental and climate change issues. After the meeting each family willing to participate in the BFP must sign the Zero Deforestation Commitment Agreement, which states that the harvested areas cannot be expanded beyond the size they hold in the year the programme was initiated and cannot exceed the limit established by the reserve, and only the secondary forest areas (capoeiras) may be used for plantation purposes. Only newly formed families (above 18 years of age) are allowed to clear the primary forest for new plantations up to a size of the individual plot area based on the community average.

Participants must demonstrate compliance with the zoning regulations of the conservation unit related to all fishing, hunting and harvesting activities. Participants shall be actively involved in the Conservation Unit Association of Dwellers and have their children enrolled and attending classes at school. Those community members who also own a house in town are eligible for the BFP only upon proof that their main source of income is located within the conservation unit (e.g. their cultivation area).

In case of non-compliance with the programme rules, the violators will be given a warning, but will be allowed to continue participating in the programme for another year. In case of repeated violations, the participants will lose their right to the payments. Their expulsion in turn will affect the contribution to the community under the Association component, since this amount is calculated as a fraction of the total annual amount of the Family component (FAS 2008a; FAS 2010b; pers. mess. Pinto 2009).

2.6 The Sustainable Amazonas Foundation

The Sustainable Amazonas Foundation (FAS) is a non-profit public organization whose legal basis is granted by the Amazon State. In addition to the endowment fund from which the BFP is financed, FAS also receive further funding from Bradesco Bank. Bradesco has provided funding for the establishment and further operation of FAS by sharing the profits from its banking products, which is equivalent to minimum of BRL 10 million per year (about USD 5 million), guaranteed for five years from the establishment of the foundation. The resources generated by Bradesco's banking products are used by the foundation to cover its operational costs and to support the implementation of the other three BFP components, except for the Juma reserve, which is financed separately by Marriott International (FAS 2010b; pers. mess. Netto 2009).

The objective of the foundation is to promote sustainable development and improve the quality of life of forest dwellers within the state conservation units. The direct actions of the foundation are focused on reducing deforestation, reinforcing social organisations within the state protected areas, improving health and education within the local communities, supporting sustainable income-generation, and encouraging information exchange and technical cooperation among various actors on community, state and international level. The foundation acts both as the facilitator of the BFP and as a fundraiser to attract various companies and organisations (both in Brazil and internationally), who are willing to support sustainable development in the state conservation units by direct monetary contributions or through technical and scientific collaboration. FAS aim to develop a market for environmental services, reinvesting the funds generated from carbon trade back into the management of the 14 protected areas under FAS' responsibility. The organisation's right to ownership of the carbon credits produced under FAS' management of the protected areas is legally recognised

by the state law (Law no.3135 and the Decree no.27.600) (FAS 2010b; pers. mess. Netto 2009; pers. mess. Pinto 2009; Viana, V. 2008).

The financial activity is evaluated by the foundation's fiscal council, which consists of the representatives from three organisations: The Amazonas State Association of Commerce (Associação Comercial do Amazonas, ACA), The Amazon State Centre of Industry (Centro da Indústria do Estado do Amazonas, CIEAM) and The General Control Agency of the State of Amazonas (Controladoria Geral do Estado, CGE) (FAS 2010b).

The ultimate control of the functioning of FAS belongs to the Board of Trustees, the superior deliberative body of the foundation, which is responsible for formulating the guidelines of the foundation's activity and appointing members for the advisory board and the fiscal council. It consists of the four sectors: business, scientific, socio-environmental and governmental, represented by the members of various businesses, as well as by government and public organisations. As of November 2009 the organisation had a team of 57 employees (FAS 2010b).

Chapter 3 Theory

3.1 Institutions and Behaviour

The analysis of environmental governance automatically requires the analysis of institutional structures, as environmental governance can be defined as "the establishment, maintenance and change of institutions to foster coordination and resolving conflicts over environmental resources" (Vatn, Arild 2009a:1). Institutions also play an important role in determining which norms and rationality apply to certain situations, thereby influencing behaviour and motivation, and thus affecting if environmental governance can achieve the desired objectives.

3.1.1 Institutions

Institutions can be seen as "the conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions regularize life, support values and produce and protect interests." (Vatn 2005:60). This categorisation of institutions according to their form and normative content or motivation relates to which type of problem they are supposed to resolve or are a response to, and the type of relationship that exists between institution and interests. Institutions thus provide expectations, stability, and meaning which is essential to the coordination of behaviour and solution to conflicts.

It is important to note that institutions are not only designed by the individuals themselves and their interests, they also define the social environment in which individuals choose accordingly, thus setting the context for rationality and behaviour. While conventions cover certain acts or solutions to a given situation, norms relate more to requiring behaviour which supports an underlying value. The latter, formally sanctioned rules, are mostly known as legal relations (Vatn 2005). Norms can be internalised, forming an automated set of behaviours, or can be externally sanctioned by punishment, possibly resulting in social exclusion. This can be performed internally in a group, or reinforced from the outside by formally sanctioned rules.

Following classical institutional economic theory, which takes a social constructivist[18] stand on institutions, four issues of importance when analysing environmental governance are emphasised. They are: the formation and articulation of knowledge; which interests and values get protection; the level of transaction costs (TCs) and the possibilities for coordination; and the motivation underlying behaviour and choice. Accordingly, the relationship between institutions and values affects which norms and rationality are applicable, and hence which behaviour is appropriate. This is important for the creation and the consequent protection of values, and reflects power relations in a society. The type of relation between institutions also affects transaction costs, by producing certain preferences and values, and affecting coordination, in turn reducing conflict. Lastly, by changing which perspectives and values apply in a situation, institutions determine which rationality is valid in different contexts and what motivates different courses of action (Vatn 2005; Vatn, Arild 2009a).

Rationality can vary from maximising individual utility to social rationality, the latter where individuals place more importance on norms focused on reciprocity and common benefits, than on individual gain (Vatn 2005). Vatn (2005) further divides social rationality into reciprocal and normative rationality. This will be further discussed in the sub-chapter on reciprocity.

3.1.2 Adaptation to Local Institutions

Institutions do not appear by themselves, they are created by humans and they have a central role in forming and shaping their lives. It is easier to reproduce existing institutions than creating new ones, which is in fact a demanding task (Vatn 2005).

In theory, institutions should be a reflection of the preferences of their members; they should coordinate behaviour and meet local needs. However, in practice it does not always work like that. If a new institution is to be implemented to change human behaviour, it is vital to understand the local social, economic, political and environmental dynamics when working with the design of the institution. To understand individual choice, one must look at the reasons that regulate such choice (Peters 2005).

[18] The social constructivist approach is based on the idea that individuals are both formed by and in turn shape institutions of the society (Vatn, 2005, Peters, 2005)

When institutions are formed with the awareness of how appropriate the values they intend to promote in a given social context are, and the sensitivity to the changes in the environment in which they operate, they are more likely to succeed (Peters 2005). REDD projects are external structures imposed on local institutions, and hence it is central to be aware of the existing local dynamics, norms and rules when designing or implementing new schemes and projects. It is important to know the past as well as the present, which will help to formulate better policies and actions, along with giving a clearer vision of future situations. Furthermore, one has to keep in mind that surprises and structural changes are expected when working with people or ecosystems (Holling 2001).

3.1.3 Resource Regimes

Resource regimes are a core concept in environmental governance, as the connectedness of natural resources demands institutional structures for the regulation of resource use and coordination between actors. The rules of resource regimes mainly concentrate on governing access and governing the distribution of outputs. The former translates to property regimes, whereof there are four main types ranging from open access, state/public property, common property, and private property. The latter, distribution rules, can also be separated into four types: market distribution, state distribution, common property rules, and no specific rules. One can define 16 different types of resource regimes, based on the combinations of these property regimes and distribution methods (Vatn, Arild 2009a)

The institutional issues concerning resource use can be divided into three parts: resource distribution, transaction costs, and the effect of the resource regime on perceiving problems, defending interests, and fostering values. This defines how the regime can protect and contribute to sustainable resource use, based on what is possible (TCs) and what is reasonable (values) (Vatn 2005; Vatn, Arild 2009a). The resource distribution includes a rights structure which relates to ownership, namely who has access to the resource and its benefit streams. Property rights are fundamental to this, ranging from the collective to the individual level. Property rights are not only formally granted; they include norms and other informal institutional elements that support its functioning. Distribution rules in turn relate to interaction between property owners, varying from redistribution to reciprocity. Transaction costs relate to the costs of setting up and running a regime, demarcation of resources and

exclusion costs. The effect of the regime on perceiving problems relates to protection of interests and resource use, as well as handling coordination problems that can arise in the process of resource management by various actors (Vatn 2005; Vatn, Arild 2009a).

Based on the four core topics mentioned above in the classical institutional economic theory (see sub-chapter 3.1.1), one can better understand the importance of institutions in shaping action in resource regimes. The formulation and articulation of knowledge and values requires good information systems and communication. Adaptive management[19] and understanding value articulation institutions is also of interest, and together these affect peoples' understanding of the situation, which in turn has consequences for their motivation. Protecting interests and values entails formulation of rights. Property rights, mentioned above, are socially defined relations, and are fundamental to resource regimes. However, the complex nature of resources results in complications when considering interest protection as to who is responsible for environmental externalities (Vatn, Arild 2009a).

Moving on to transaction costs, efficiency is a key element. Transaction costs include the expenditures related to setting up and running the necessary administrative systems, gathering information, making laws and contracts, and controlling that these are followed. What is efficient in one regime can be inefficient in another. Internalising externalities can take various forms and is often regime specific. State regulations can often provide good solutions here, while PES are an additional example of development in this area (Vatn, Arild 2009a).

Lastly, the institutional setting influences rationality, and the willingness to cooperate depends on the institutional context. When making policy changes, one must bear in mind that they can affect the willingness to support them, and undermine their own efforts. This is especially true for monetary incentives, where economic studies have investigated the effect of introducing payments to change behaviour (Bowles 2008; Gneezy & Rustichini 2000; Vatn, Arild 2009a).

[19] Adaptive management emphasises systematic learning from system testing, and a high capacity to change management rules constantly. Accepting and inducing constructive change will augment a system's resilience, thereby protecting its capital and withstanding destructive change. Social-ecological systems are complex and dynamic, and there is no single approach to manage them (Holling 2001; Ostrom 2007)

3.1.4 Institutions and Motivation

While standard neoclassical economic theory views rational choice based on individuals seeking to maximise their utility (RMIU) theory, observations from economical experiments on behaviour have revealed that many participants cooperate and punish others even when this entails a loss on their part, e.g. Gintis (2000), Gintis et al. (2003), and Vatn (2009). Within the classical institutional theory, there is modern viewpoint which sees humans as multi-rational, where rationality and value expressions depend on the institutional setting within which choices are made. Institutions define the logic of a situation, differentiating between when an individual could pursue its own interests as opposed to including others and cooperating. These issues of coordination mean institutions can be seen as rationality contexts, thus explaining behaviour patterns (Gintis 2000; Gintis et al. 2003; Vatn, A 2009).

Experiments on individual choice behaviour and strategic interaction have shown higher rates of cooperation than can be expected from the standard economic model of the self-interested actor. Empirical results from the ultimatum game, where participants must make a deal that is accepted by respondents to share money, have shown that the game largely ends up in fair splits. The public goods game, which is based on cooperation leading to the highest pay-off for the group, but non-compliance resulting in the Nash-equilibrium, shows that between 40 to 60 % cooperate in one-shot games and roughly 1/3 of players prefer cooperation results over individual gain. Experiments on wage-effort options between employers and employees also show high rates of compliance to voluntary commitment to high input among employees in response to trust from employers (Gintis 2000; Ostrom 2000; Vatn, A 2009). This has lead to a change in the understanding of human choice, and requires a new focus on institutions as mediators of individual choice.

As mentioned before, social rationality can be loosely divided into normative and reciprocal rationality[20]. Yet these two alone cannot fully explain observation from behavioural experiments, as the trait to cooperate with others and punish violators even at a high personal cost occurs without the expectation that these costs will be covered. There are several theories attempting to explain the occurrence of cooperation despite individual losses. The Folk theorem, which is based on the RMIU hypothesis, states that cooperation becomes favourable

[20] However, reciprocity can work both ways. If desirable behaviour is experienced, one will reply with the same positive action, thus reinforcing social rationality. But if undesirable behaviour is experienced, and met with punishment, this can be based both on what is good for the society (i.e. social rationality) and individual feelings (i.e. individual rationality). Thus, individual interests can encourage social rationality-based behaviour.

after repetition[21]. Another explanation known as the expanded utility function proclaims that intrinsic motivation and self-image affect choice and behaviour. Turning to the idea of reciprocity, Gintis et al. (2003) claim some people are more reciprocal than others, and by using game theory they predict when cooperation may occur and when it may not. Fehr and Gintis (2007) have further emphasised the role of institutions as norms in reciprocity. They assert that this shows how society, via institutions, has the capacity to shape individual preferences. Still, individuals will choose among these preferences based on which gives them higher utility value. In addition, the second-generation model of bounded rationality emphasises that norms determine behaviour, particularly when feelings of pride and shame are involved. Hence, status can play an important role in reciprocal behaviour, and social processes are thus important for internalising these norms (Fehr & Gintis 2007; Gintis et al. 2003).

Moving ahead with understanding institutions as determinant for rationality, Vatn (2005) offers an institution-as-rationality hypothesis, emphasising that institutions provide expectation and meaning to a complex world in addition to their function as conventions, norms and formalised rules. Thus they identify the logic of a situation, i.e. whether individual or social rationality is expected, making coordination of behaviour easier. Social rationality, or reciprocity, often results in success in the case of physical interdependencies or in an evolutionary sense in order to survive. For example, common resources fare much better if the individuals choose social rationality over individual utility, as the latter could be detrimental. These problems are resolved by creating institutions that make cooperation a practical and feasible solution.

There are certain factors that must be mentioned, which have an effect on the form of rationality and hence cooperation. Individual upbringing or history will result in variations across institutional setting, as argued by Vatn (2009b) and Gintis (2000). Biel and Thøgersen (2007) mention three factors of significance for cooperation based on studies. The classification of the situation, i.e. framework and naming will affect how individuals interpret the situation. The behaviour of others is likely to affect one's own choice – either by reciprocity of favours or punishment of non-cooperation. By communicating, participants can commit to cooperation, proving a strong relationship between communication and

[21] This may be so as the chances of retaliation increase and fear of social judgement prevents anti-social rationality behaviour. However, this does not mean that the participant does not act out of individual interest, as avoiding social judgement is also in ones individual interest.

cooperation. Distributive justice and retribution to discourage defectors also affect cooperation. This brings us back to the norm of reciprocity, which calls for positive responses to positive actions, but negative responses to actions seen as unfair (Biel 2007).

There is plenty of evidence supporting the assertion that social norms play an important role for cooperation in social dilemmas. Cooperation is consistent with moral values, and both personal and situational factors are relevant to the activation of norms in social dilemmas. Situational behaviour is associated with norms related to the behaviour of others, while personal factors are related to a feeling of obligation to protect the resources at hand, which in return has a more direct effect on the environment. Cooperation can often be observed in the protection of local environmental public goods, and Gintis et al. (2003) argue that this behaviour, termed *strong reciprocity*, explains altruism in human behaviour.

Yet costs play a large role in cooperation in such circumstances, as attitudes and norms have a stronger effect on behaviours that are relatively inexpensive or easy to perform. If defection is increasingly profitable, cooperation rates drop, although research from common resource properties show that reciprocity norms uphold cooperation despite high costs. Here, by participating over time, individuals can identify each other and their behaviour, and defecting can result not only in sanctions, but also in social exclusion. Additionally, a general equity norm may be put forth, which reinforces cooperation when individuals understand they benefit from a public good or the conservation of a resource. Experiencing that others cooperate continuously can generate a reciprocity norm. In these cases, resources are of importance for survival, and defecting can jeopardise the survival of the entire community. This however, requires feedback about resource status. Large-scale environmental issues, such as climate change, have poor feedback loops, easily resulting in overuse and non-cooperation (Biel 2007).

3.1.5 Effects of Payments on Motivation and Cooperation

Providing monetary incentives or compensation to encourage behaviour or willingness to accept to provide certain goods or services has received increased attention. Based on the RMIU theory, performance is linked to effort, and monetary incentives should thus increase performance when a self-interested, outcome-oriented individual is in such a choice situation,

where social interaction is only of interest if they impact positively on consumption and wealth (Gintis 2000; Gneezy & Rustichini 2000).

Results from experimental studies on the effect of these payments on behaviour have shown to undermine efforts. A social norm that may be undermined by monetary compensation[22] is reciprocity. Reciprocity is based on a retuned favour, or other benefit. Paying for this destroys the very basis of reciprocity, and the action becomes less appealing in its own merits. Gneezy and Rustichini (2000), show that the effect of small monetary incentives can be detrimental to performance. But when a higher monetary value was offered, performance increased. The results reveal that intrinsic motivation can be affected negatively by extrinsic motivation.

This reflects the importance of how those receiving perceive the incentive, as it can affect motivation, participation, and performance. When individuals act without receiving compensation, the motivation is internal and independent of any reward. On the other hand, if a monetary incentive is given to the same individuals, they assume that the payment is their motivation. Incentives may induce change in motivation and change preferences because they affect key aspects of how we acquire our motivations, and the level of the incentives is crucial here (Bowles 2008; Gneezy & Rustichini 2000).

The theory of crowding-out specifies that intrinsic motivation can be partially destroyed when price incentives are introduced. There are claims that monetary incentives undermine an individual's sense of civic duty and have detrimental effects on the action involved. Human behaviour is influenced by both intrinsic and extrinsic motivation, where intrinsically motivated behaviour is based on altruistic feelings. Paying for this behaviour can thus reduce the occurrence of these feelings, subsequently eliminating or reducing motivation to perform the task in question. This is not to say that price incentives do not work; but that their use can become more costly, as higher payments are needed to achieve changes in behaviour. A higher level of payment can also lead to a higher probability of crowding out. If an action is seen as civic duty by communities or individuals, introducing payments can decrease their willingness to perform the duty. However, actors could also consider strategic behaviour with the aim of securing high returns on their participation, or interpret monetary benefits as a sign of higher importance of the performed activity than previously perceived (Frey & Oberholzer-Gee 1997).

[22] In this sense, compensation clearly indicates who the rights belong to: the ones forced to change (former polluters), or the former "victims" of environmental degradation (Bromley 2006).

Hence, using price incentives should be re-evaluated in policy areas where studies have shown that intrinsic motivation can be important, for instance in environmental policy. In policy areas that have no issues of intrinsic motivation, or it has already been crowded out, the relative price effect and therefore the use of compensation, are potential strategies to obtain local support (Frey & Oberholzer-Gee 1997).

3.1.6 Ostrom's Design Principles for Common Resource Management

The complexity of socio-ecological systems makes it difficult to find the best institutional design. A set of principles that can ensure long-term institutional settings for natural resource management have been suggested as necessary conditions for enduring common pool resource (CPR) management institutions (Ostrom 1990). Yet, the model developed by Ostrom is for local environmental management where the institutions have been created by the community itself, and thus do not constitute an external institutional framework. Nonetheless, the eight principles provide an important insight to some issues that need to be addressed if natural resource management institutions are going to be efficient and function properly.

Ostrom defines the design principles as "essential conditions that help to account for the success of […] sustaining the CPR and gaining the compliance of generation after generation of appropriators to the rules in use" (Ostrom 1990:90). To be successful, institutions must be able to protect and monitor their resource bases from excessive exploitation (Tucker in Ostrom 1990).

Though Ostrom's design principles are framed based on the assumption of the rational choice approach, she recognizes that the institutional framework in place is more important than many policy makers assume. Empirical evidence has revealed that Ostom's model contains key elements and structures for enduring local collective action (Vedeld 2002). Ostrom has emphasized that her design principles do not provide a blueprint for analysing resource management regimes, but they have consistently been found in robust CPR management examples (Ostrom 2005).

The eight design principles are as follows: Clearly defined boundaries, Proportional equivalence between benefits and costs, Collective-choice arrangements, Monitoring,

Graduated sanctions, Presence of conflict-resolution mechanisms, Minimal recognition of rights to organise, and Nested enterprises.

One of the most important principles in Ostrom's model that can be used in both self-managed institutions or externally imposed institutions for environmental management, is the fourth principle covering issues related to monitoring systems. There will always be free riders trying to maximize their individual utility that are detrimental to collective action, and therefore controlling and monitoring mechanisms are central to avoid undesired behaviour (Ostrom 2005).

If institutions imposed from outside are to successfully govern common pool resources, they should consider that an effective monitoring and control mechanism is of fundamental significance. According to the fourth principle of Ostrom's model, rules must be enforced to obtain robust governance and to make people respect and follow the rules. If there is a proper institutional monitoring system, undesired practices and behaviours can be detected and corrected.

In addition, there can be a need for graduated sanctions, to enforce behaviour and strengthen the monitoring system. They need to be appropriate and in accordance with the level of the violation of the rules. Following this, if weak sanctions are in place, the rules risk not being respected, as violation of the rules will pay more than compliance. Reversely, if sanctions and punishment are too strict, the system loses legitimacy (Ostrom 2005).

3.1.7 How Institutions Influence Transaction Costs

Institutions are important for the functioning of societies, economies and governments; yet the establishment and running of an economic system, and the coordination of interaction between different players is costly. Accepting positive transaction and information costs have induced the new institutionalist school to underline the comparative analysis of institutional structures. Within the new institutional economics perspective, transaction costs are positive and institutions such as states or firms may in various situations offer coordination options less costly than individual contracting. Institutions are just seen as external structures which regulate social interaction; therefore the focus of this economic school has been on how diverse institutional systems can reduce these costs (Vatn, Arild 2009b). On the other hand,

the classical institutional economics tradition highlights the dynamics of real human life. The acts of one person will affect the opportunities of others. This school emphasises that institutions also structure individuals through diverse socializing processes, by promoting, creating and protecting different interests and values (Vatn 2005). Both traditions see institutions as important for determining the level of TCs.

3.2 Payments for Environmental Services (PES)

This section introduces the issues that may arise when designing and implementing a PES-based scheme in order to protect natural resources.

3.2.1 The Concept of PES

PES are a way to convert non-monetary values of services generated by ecosystems into financial incentives for resource managers to adopt sustainable practices and ensure continuous ES provision (Engel et al. 2008). The ES produced by ecosystems are often public goods, they are non-rival and non-excludable. This means that the consumption of such good by one person does not affect the consumption of the same good by others, and no one can be excluded from it (Corbera et al. 2009). The idea is that since such goods are most often not priced, the result is detrimental resource allocation. When an economic decision has to be made in a traditional market setting involving goods and services which have not been assigned a monetary value, such as the local and global benefits produced by a standing forest, and those which have an assigned monetary value, such as benefits of converting standing forest into agricultural or pasture land, a decision not in favour of a sustainable resource use is most likely to be made, as it would not generate any measurable and tradable profit (Vatn 2005). For this reason the provision of ES presents a classic case of positive externality, and traditionally has not been included in economic decision-making (Kosoy et al. 2007).

An additional financial reassurance and special markets for environmental goods and services are required in order for sustainable resource uses to compete with environmentally abusive but financially more attractive practices (Fearnside 2008a; Vatn, Arild 2009b). PES seeks to

recreate the missing link between resource managers and ES users by correcting the market failure and internalizing the value of ES, which in turn promotes environmental protection (Corbera et al. 2009; Engel et al. 2008; Hall 2008).

Payments for environmental services are formally defined as " (a) a voluntary transaction where (b) a well-defined environmental service (ES) or a land use likely to secure that service (c) is being 'bought' by a (minimum one) service buyer (d) from a (minimum one) service provider (e) if and only if the service provider secures service provision (conditionality)" (Wunder et al. 2008:835). Examples may include farmers, whose land is located along the river, and fishermen, who depend on fish stock affected by water pollution from agricultural fertilizers; or the Amazon forest dwellers and the global commons, who depend on the atmospheric processes, regulated through the forest cover.

The buyers of the ES may be the users of the service themselves or a third party acting on behalf of the ES users, e.g. a government or international agency. When actual users act as buyers of the service, they generally have a stronger incentive to support good functioning of the PES scheme and can directly evaluate the quality of service provision. They also have a better capacity to adjust contract conditions. When a third party acts as a buyer, it usually lacks direct information on service value and cannot observe the quality of service provision (Engel et al. 2008). Corbera et al. (2009) have found that PES initiatives are more effective when they are developed in cooperation with both service providers and users, and are less successful when a third party acts as an intermediary without consulting with stakeholders directly. However it is natural that markets for carbon credits are operated through third parties due to the impossibility of delineating the service at the point of its origin to a concrete user elsewhere in the world.

3.2.2 Valuation of Environmental Services

When referring to payments aimed at preventing deforestation, the payment amount may be determined based on stock maintenance, i.e. calculating the annual value of carbon stock generated by each provider through avoided deforestation compared to business as usual (BAU) scenario, and paying the percentage of this value to respective providers (Fearnside 2008a). Such a method involves certain insecurity due to possible carbon price fluctuations. However in order to be efficient on the whole, any payment scheme, no matter the objective,

must meet two conditions: the payment amount should not be less than the opportunity cost of the required land use for the service provider, and at the same time the amount should not be greater than the value of the provided service (Kosoy et al. 2007). There are two ways of valuating ES using the approach based on opportunity cost determination: calculating uniform or differentiated prices for each ES provider, where the opportunity cost is equal to income that would have been generated under the BAU scenario, based on the simplified assumption that the value of the standing forest is zero to the owner.

Individual opportunity costs may be calculated for each provider based on the economic value that their respective land uses would have produced under the BAU scenario (Börner & Wunder 2008). However, the precise calculations may be too costly or logistically difficult to conduct, especially when the number of project participants is high and the area incorporated into the project is vast and/or highly heterogeneous in terms of soil fertility, climate conditions, modes of production, etc. In the Brazilian Amazon, for example, the proximity of land property to roads and rivers is an important factor positively affecting the opportunity costs (Börner & Wunder 2008). The deforestation phase has also to be taken into consideration. While the initial phase, where no or little deforestation is happening, and the final phase, where no forest is left for clearing, would yield low opportunity costs, the intermediate phase, where the deforestation is most active and large areas are allocated for timber harvesting, would account for the highest opportunity costs (Fearnside 2008a). Such calculations may be complicated even further if the project is paying for more than one type of ES. Calculating the opportunity cost for each ES may involve complicated combinations of various scenarios, if provision of each service assumes suspending different activities.

Uniform payments are usually calculated based on the provider with the highest opportunity cost (Börner & Wunder 2008). This is consistent with the aforementioned logic that in order to secure consistent participation, the payment amount should be no less than the opportunity cost of the service provision. If it were lower, the participants with highest opportunity costs would not see any financial incentives in joining the project.[23] When uniform payments are applied, it

[23] However some literature (Kosoy et al., 2008) mentions cases where the payment amount was found to be lower than the opportunity costs. Authors propose three possible explanations to this contradiction. First, assuming that project participants are rational economic actors and that they participate in the venture voluntarily, they must consider their opportunity costs covered, even though the calculations may show otherwise, whether correctly or not. This brings us to the next possible explanation that the opportunity costs may have been overestimated due to erroneous assumptions regarding the area's suitability for farm activity. Another explanation is that the providers' perception of "fair" compensation and their profits have been persistently exaggerated as a strategy to negotiate better payments. The importance of non-monetary benefits of

creates a "provider surplus", which is the difference between the compensation amount and the opportunity costs of service provision.

Overcompensating service providers may be perceived as inefficiency by service buyers, as designing a project with highly differentiated payments may either bring significant budget savings or allow expanding the project area to include more service providers who would be receiving lower payments (Börner & Wunder 2008). However one should keep in mind that gains produced by more precise cost targeting may be offset by transaction costs related to designing a differentiated payment schemes, e.g. additional data collection and administrative adjustments (Engel et al. 2008). Besides, it is the poorest strata who are usually the providers with the lowest opportunity costs: due to lack of choice they are often forced to use marginal lands with lowest productivity and employ simple modes of production, being unable to afford better technology. Thus the gain from the "provider surplus" would be the greatest for the poorest landholders (Börner & Wunder 2008; Grieg-Gran et al. 2005). Therefore, from the standpoint of many PES projects' explicit promotion of improving livelihood security, an opportunity for poverty alleviation through applying uniform payment schemes could be considered as an indicator of project efficiency.

The suitability of payment forms is also important. For example, payment beneficiaries may have no use for money if there is nowhere to spend it, i.e. the infrastructural challenges may make it either impossible, or too costly to commute to markets (May 2004). In such cases substitutes to monetary payments must be found, such as provision of other material assets to service providers (equipment, means of transportation) and access to social services (health, education).

3.2.3 Poverty Alleviation

As mentioned above, vulnerable groups and the poorest people are generally located in upstream areas or in areas where the land is frequently less productive. Nevertheless, these rural communities still provide environmental services to other groups with better economic situations. Although, PES programmes were not designed to focus on poverty reduction, they are expected to have the potential to contribute to wealth distribution and poverty alleviation

participating in the program, such as education and technical assistance, has also been assessed as likely reason for participation despite the fact that the payment amount did not correspond to the opportunity costs

among the rural poor by conserving the natural ecosystems on which they rely. In addition, PES schemes may contribute to poverty reduction through the stimulation of new skills, which can improve livelihood security. PES may improve environmental conditions, increasing awareness about the economic worth of ecosystems and contributing to economic development (Engel et al. 2008; Kosoy et al. 2007).

On the other hand, PES programs are not a poverty alleviation tool. Poor people were not the initial target of PES schemes and therefore they may be also affected in negative ways by them. The poor can suddenly become a buyer of a good that was free for them before. The involvement of vulnerable groups in the design of PES schemes or in the participation of the programme is of central importance. Unfortunately, vulnerable groups, such as minorities and the poor do not always have a say in such processes and in many situations they cannot be beneficiaries of PES programmes. Without a cautious design, poor people may not benefit from PES programs (Wunder 2005).

3.2.4 Additionality

The effectiveness of PES schemes is often evaluated on the ability to avoid lack of additionality, i.e. investing in activities that would have happened regardless if the project had been implemented. However one may differentiate between direct and indirect additionality, where indirect additionality refers to the effect on keeping the participants whose presence ensures that undesired practices do not arise in the project area. PES programmes should ensure and improve the delivery of environmental services compared to a BAU scenario, and should include forests that are threatened by logging, agricultural expansion or degradation in the future. Giving a reward can diminish the economic pressure to deforest by providing an alternative income source or benefit all (Bond 2009). However, some PES programs are not aiming to produce additionality; instead they are focused on finding ways to pay local communities that live in protected areas for performing conservation services that they provided prior to the introduction of payments, and should not be judged by this criterion.

3.2.5 PES Scheme Design, Targeting Issues and Distributional Effects

Trading of ES is a relatively new phenomenon. Unlike standard commodity exchange, which has been shaped by socio-economic processes for decades, the markets for ES are created on the spot. The question is: how capable are these new structures of ensuring fair access, participation and distribution (Corbera et al. 2007)? Does the mechanism work well within the local context of property rights, access to resources, and the driving forces behind environmental degradation? Participation in a PES programme and distribution of benefits can be affected by the following factors: factors that determine the eligibility to participate in the programme, factors that influence providers' willingness to participate, and factors that condition their ability to participate (Engel et al. 2008). The distribution of benefits may further be influenced by various side effects produced by PES programmes.

In regions, where land grabbing is common and large-scale and illegal deforestation is prevailing, the ability of a PES programme to change behaviour may run into significant obstacles. Yet it cannot be designed with the aim to incorporate opportunity costs based on the income that would have been generated through illegal activities. It is both unaffordable and ethically wrong. Also the fact that a lot of physical relocation is involved in the process of illegal deforestation makes it impossible to implement the project, as there is no way to ensure that service providers will be available in the long run. This is why participation in most of the PES schemes requires a possession of legal land title (Pagiola 2008; Wunder 2006). In this case a substantial number of "ethically" qualified and potentially loyal service providers are more likely to be excluded. This presents two problems: first, a missed opportunity for poverty alleviation, as many of de facto land users are the poor, and second, exclusion of some areas despite the fact that deforestation there is a real threat. At the same time if additionality is the decisive eligibility factor, the bulk of payments will be allocated to the large commercial landowners who are the ones that are most responsible for deforestation (Börner & Wunder 2008; Fearnside 2008a).

Thus in the areas of weak property rights one might have to build PES on de facto user rights. It has been suggested that participation in well accepted PES schemes may reinforce participants' de facto control over the territory and give them more legitimacy (Wunder et al. 2008). In this regard it is important to evaluate who is going to be selected for receiving payments and whose rights and claims will be legitimized. Targeting those potential service providers, who have obtained their user rights through illegal activities, may give perverse

perception of the project and promote similar behaviour in other actors, attracted by the possibility of becoming eligible for payments. The efficiency of payments channelled to forest-dwelling and indigenous communities will be less likely jeopardised by the lack of permanency of land-holders in the area and by the aspiration to receive immediate gains, which is common among large-scale loggers and illegal land grabbers (Fearnside 2008b).

Grieg-Gran et al. (2005) mention a few other issues in relation to small-holders. If the size of the land is too small, it may be simply impossible for land users to set aside a part of it for carbon sequestration, as they will have not enough left for their own subsistence production. Also small-holders have no "locational advantage" in providing carbon services in comparison to owners of large-scale properties.[24] It is expected that as carbon markets become more competitive, it will cause further marginalization of poor small-holders.

Poorer people do not always have the means to access information, and therefore may be excluded from PES schemes. In this scenario, pro-poor policy measures are needed to reduce transaction costs and to ensure participation of the poorest within PES schemes (Grieg-Gran et al. 2005).

Transaction costs for the facilitator of the programme may also serve as a barrier to participation of the poor. As the number of participants increases, the costs associated with negotiating and setting up individual contracts also grows (Pagiola 2008)[25]. For this reason the preference may go to large land-holders, as the same amount of time and money spent on negotiating the contract will yield more profits in terms of services provided, according to the principle of economies-of-scale (Corbera 2009)[26]

While PES seek to secure long-lasting provision of ES and improve the livelihoods of marginalized service providers, it is important to ensure that in trying to achieve these goals no one is made worse off (Grieg-Gran et al. 2005). Unfortunately, PES schemes are not immune

[24] If a small plot of land does not have good characteristics for carbon sequestration, a small-holder has no other alternatives to offer to the project, whereas large scale properties may also suffer from sequestration inefficiency in some areas, while having the necessary characteristics in others. As a result, the large scale property may be considered overall eligible for participation.

[25] Some projects have attempted to include many small-holders under the collective contract, however such solution was challenged by the fact that incompliance of a single group member led to suspending payments for all.

[26] Some government-led PES programs are arguably more cost-saving due to their spatial scale and usually undifferentiated payments. However they often suffer from other forms of inefficiency, namely lack of conditionality. Governments are usually very reluctant to apply sanctions in relation to poor service providers in case of inconsistent service delivery. Such programs suffer from lack of clearly defined objectives and often serve as channels of distributing government support to the poor rather than as means of securing ES provision.

to creating negative externalities. PES projects may suffer from leakage, i.e. shifting of undesired practices to outside of the project area. Besides, there are various problems causing negative economic and social consequences. PES projects (based on per-unit of land payments) may lead to land concentration, as prospects of getting payments may trigger some of the potential service providers to buy more land. Such process may have especially profound consequences if the service provider is a large commercial organization which can afford to buy hundreds of hectares (May 2004). Also PES projects may increase the value of land which can give more incentives for land-grabbing (Vatn, Arild 2009b). This is particularly undesirable under conditions of weak tenure security in the Brazilian Amazon. Land speculation incentives may also grow, causing in turn the price of land to increase even more.

If a project requires considerable areas of land to be allocated for conservation, it may reduce local opportunities for food production, driving the food prices up. In addition, PES projects may decrease employment levels in the area if most of the jobs have to be suspended if they conflict with project goals. This puts landless labourers at particular disadvantage, as they will not be able to participate in the payment scheme**.** Also PES projects have been criticized for reducing flexibility of livelihood strategies of the poor because service providers have to commit to long-term contracts which delimit their activities (Grieg-Gran et al. 2005). Hence it is important that the project provides alternative employment or income generating options, not only due to ethical concerns, but also to eliminate possible motivations for any activities undermining the project objectives.

3.3 Institutions, PES and Behaviour

Compared to other environmental governance tools, PES may prove to be more effective when the monitoring factor is taken into consideration. It has been argued that securing cooperation from service providers is easier when offering them positive reinforcement rather than threatening to punish them (Engel et al. 2008). Direct payments can serve as a supplementary measure to command-and-control measures, such as structures which prohibit deforestation and follow up with strict punishment. Payments may provide more effective incentives towards permanent land settlement and conservation, and serve as a positive reinforcement, making command-and-control policies more acceptable (Börner & Wunder

2008). PES has the potential to create a positive attitude towards environmental laws, facilitate cooperation among service providers, and change behaviour.

3.3.1 Adaptation to Local Institutions

Individuals act in relation to the values of the institutions with which they feel associated. When economic incentives compromise social preferences, the outcomes and responses may be the opposite of what is expected. Good policies and institutions are those which support socially valued ends, not taking into account only selfish preferences but also keeping in mind the social ones (Peters 2005). Environmental governance tools like PES are in an experimental phase, and they should be able to adjust to the local value systems.

A well-functioning PES mechanism thus demands understanding the institutional setting of the scheme, in addition to the need for having cooperative parties. Where environmental services such as forests or water form the base of peoples' livelihoods, introducing money can disrupt value systems and cause conflicts between stakeholders, possibly reinforcing social disparity. Those establishing PES mechanisms must be aware of these factors and emphasize trust building and participation for the PES to work (Engel et al. 2008; Vatn, Arild 2009b).

3.3.1.1 Equity and Legitimacy

New policies not only define the boundaries of permitted actions, but they also may change the attitudes of the actors, which in turn may affect their willingness to cooperate and the level of participation. In order to be sensitive to such aspects, new institutional arrangements should be guided by the ideas of governance[27], equity and legitimacy.

Equity and legitimacy need to be taken into consideration when making environmental decisions and when putting in place a market for environmental services. Equity has to do with the distribution of socio-economic factors and goods in a society. Legitimacy covers the process of negotiating and managing outcomes and results, and how these are accepted by stakeholders. The capacity of institutional structures to recognize and incorporate various

[27] Lebel et al. (2006:2) define governance as "laws, regulations, discursive debates, negotiation, mediation, conflict resolution, elections, public consultations, protests, and other decision-making processes."

stakeholders' values, interests, knowledge and needs into the decision-making process (Corbera et al. 2007). Both are important for achieving social goals alongside financial outcomes.

Lemos and Aragwal (2006) discuss the need for decentralization of environmental governance. They suggest that decentralization will bring better efficiency, induced by competition among governance units, and will create a better access to decision-making process and increase participation by bringing governing structures closer to the actors affected by it, and will help decision-makers have a better contact with context specific knowledge of the socio-ecological system in question.

The recognition of the programme by its participants will be largely dependent on the characteristics of the existing governance structures. The participants should be able to relate to the governing institutions in place through social and political factors such as class, gender, ethnicity, religious affiliation and fairness of distributional outcomes. Not only the governance process needs to be legitimate in terms of including stakeholders, but the governance structure also needs to be trusted and recognised by the participants. Including state authorities provides more weight in relation to the implementation of the project, however many government-led initiatives are often contested by various political pressures (Corbera et al. 2007; Engel et al. 2008).

3.3.2 Participation

Participation is rooted in the theory of democracy and power relations, and is related to the formulation of questions regarding who decides about a specific issue, how, where and why, and covering all levels of society. Participation is also seen as a prerequisite for legitimate outcomes (Vedeld 2009).

Involving local people in the design of projects aims to improve and solve socio-economic and environmental problems, and is seen as the best way to create effective and efficient solutions. At the same time governance structures may win legitimacy among people. Nonetheless, participation is more than a goal or a condition to accomplish; it should be seen as a right for all actors. We could say that many governments and organisations working with development issues have a very strategic view of the concept of participation. It is often used

in a very instrumental way in a goal-oriented process, where central actors in organised structures find measures and design instruments aiming to change local dynamics following the predetermined (external) goals and objectives (Vedeld 2009).

In this study we will use an approach where participation is seen as a decision-making process. This entails the self-mobilisation of local people and encouragement to use their rights to organise in order to generate collective action, and empowerment to decide which solutions best address their social concerns. However, we are aware that in many situations, the ideal concept of participation cannot be implemented due to the lack of education (it can be difficult to obtain all necessary information which is required for full participation) or the lack of institutions that can facilitate the process, which is why building appropriate institutions is so important.

The term participation is "highly context-specific and in practice it ranges from coercion to full local control" (Hobley 1996:8). There are three levels of participation in relation to the interaction among local people and outside agents in decision making processes. These levels are top down approach, professional guided participatory approach and endogenous bottom-up approach (Inoue (1998) in Nanang 1999).

In the top down approach, local people are consulted about decisions post factum to the decision making process. Within the professional-guided participatory approach, drafts and plans are elaborated by external professionals. Within this approach people may be consulted, but only after major and central decisions have been made by outsiders. The bottom-up approach is characterized as a constant learning process, where external professionals take actions according to local needs; they act as facilitators and do not impose any conditions onto local people. In this approach local actors take an active role in participation, by analysing outcomes and developing future projects and local organisations (Inoue (1998) in Nanang 1999).

In many situations local participation can become a threat for external organisations (donors or governmental). When residents of a community have the willingness to participate and be part of all of the decisions that will be implemented, it can slow down the implementation process of a determined programme or project. When people are not organised it is easier to manipulate, misinform and put into practices unwanted projects (Pretty (1995) in Vedeld 2009)

3.3.3 Leakage

Leakage is one of the biggest concerns in regards to PES projects focused on avoided deforestation, and can be both direct and indirect. Direct leakage consists of sellers moving their undesirable activities to other areas, while indirect leakage can appear through market mechanisms by influencing the prices of crops and land. In the Amazon region this is of interest, as there are fears that small PES schemes, although beneficial, can shift deforestation pressures to unprotected and unsupervised areas (Romano n.y). For instance, if a reserve is created, people who would have been clearing the forest within the reserve may move to a different place close by, and clear the same amount or even more in the new site. As a result, the benefits achieved by the establishment of the reserve and the implementation of the mitigation project will be diminished or even neutralised (Fearnside 2008a).

One way of dealing with this issue is to include land and people that live near the boundaries of the programme. In can make a significant difference, especially in areas where forests are cleared by smallholders for local use of wood or subsistence crops. However, in situations where the participants have big lands or a logging firm, leakage will be more complicated to prevent (Wunder et al. 2008).

3.3.4 Monitoring and Control Issues

There are several issues that must be addressed for PES schemes to work. Per definition, there must be a continuous supply of ES if payments are to be made. This requires investment in monitoring and control, and the enforcement and legal institutions to ensure this are often lacking in developing countries. In Brazil for example, legal enforcement in the Amazon region is exhaustive due to the sheer size, as well as lacking funding from the federal and state government (Romano n.y).

Returning to Ostrom's fourth principle on monitoring, unless control mechanisms are in place, resources can be more easily overused. This can be an interesting issue in the case of PES schemes in Brazil, as by reinforcing local monitoring and control of the rules by the users themselves, the programme can avoid high costs and increase a sense of empowerment both for the participants and the organisers. However, this system also has its weaknesses, as it depends largely on the willingness of local users to report illegal practices. In the case that the

rules have not been negotiated by the users themselves, but have been imposed by third party-organisations or governments, monitors can lack motivation to inform and perform their roles as resources protectors. There can also be trust issues between local monitors and external governors, if the authorities in charge are slow to act upon reports of illegal activity, or there are problems with corruption.

The level of sanctions is important, as participation is encouraged, but it also must be graduated according to performance. Weak sanctions can have no effect, while strict sanctions can discourage local interest and participation. It is also relevant how much one should punish and remove access to programme benefits, when the goal of the project may be to improve social development.

3.3.5 Transaction Costs

It could be argued that in Brazil the bulk of efforts should be channelled into the avoided deforestation modality. Coupling PES initiatives with reserve creation, especially in the buffer zones, may yield even more successful outcomes. Fearnside (2008a) for example suggests that presence of a reserve reduces the chances of illegal land grabbing and consequent titling. Thus it is also possible that the TCs associated with monitoring and control will also be reduced if a PES project is applied within the protected area, since in most cases the reserves would already have the existing infrastructure and necessary actors fulfilling the control function in place. Additionally, people legally residing in the reserve may feel more protected. In turn, security should make the idea of sustainable forest management seem more attractive, especially if such practices are financially rewarded, by moving the focus away from immediate gains. Such measures will secure the permanence of the project. TCs related to introducing the rules and negotiating contracts with new service providers thus shall be minimized if the participant turn-over rates remain low. Besides, costs of avoiding deforestation are significantly lower than those of "affirmative actions" such as reforestation (Wunder et al. 2008).

Governments or an intermediary NGO can play significant roles in facilitating cooperation, as well as in terms of costs for setting up a PES scheme and creating the market for the payments, as these can be very costly. Government schemes usually have lower transaction costs than private schemes, depending on the nature of the resource and exclusion possibilities, and influence whether the payments will be targeted or flat rate (Engel et al.

2008; Vatn, Arild 2009b). However as mentioned before, many government-led programmes are criticized for their lack of flexibility and focus on poverty alleviation issues more than on the environmental ones. Thus, a well established non-governmental organization with large operational capacity, international connections and wide range of expertise may be the ideal intermediary. Such an agent would still be capable of reducing TCs while connecting service providers with service buyers, but with a lower risk of being side-tracked by any socio-political agenda.

3.3.6 Effects of PES on Norms and Behaviour

Social relationships affect prices and perceptions of payments. The participants' rationality– if they are seeking individual gain or rationality based on reciprocity and relationships - impacts on PES schemes, and can make monitoring and control more costly and transaction costs higher. Introducing payments can also influence motivation, by creating crowding-out effects. As a result, introducing payments may demand a pre-existing environmentally friendly attitude among participants. Once payments have been introduced, previous behaviour may be difficult to re-establish, as the logic behind actions may have changed (Vatn, Arild 2009a; Vatn, Arild 2009b). Yet Corbera et al (2009) show that where strong conservation values are embedded in local culture, the introduction of PES may be better accepted. It may imply that PES can reinforce existing institutions favouring sustainable land use practices in addition to acting as a financial incentive. Thus, even if a strong norm of protection already exists in the area of implementation, as mentioned above, the way the payments are introduced may affect motivation either positively or negatively.

If a payment is introduced as an incentive to change behaviour, crowding-out is a possible negative outcome, as participants may feel insulted that their norms have been assigned a price. However if it is seen as a fair offer, and thus grounded in ideas of a reciprocal relationship, the payment is more likely to succeed in changing behaviour or reinforcing already existing norms of desired behaviour. This depends largely on the amount of payment, and if it is perceived as a fair offer by the beneficiaries. This amount can be difficult to determine, as high payments may not be economically feasible, yet low payments may not induce the desired effect. Nonetheless, there is an alternative discourse that may be employed to introduce the payments, namely acknowledgement. This entails purely recognising the role

and actions that for example forest dwellers provide in terms of forest protection. Crowding-out out of norms related to this behaviour is then less probable, as this discourse should not provoke changes in rationality.

3.3.7 Actors

To have a better comprehension of the process of deforestation of the Brazilian Amazon, it is important to understand who are the different actors involved and their roles. This understanding is central in implementing new policies aiming to avoid deforestation and promote environmental preservation.

Fearnside (2008b) has identified nine types of actors involved in the process of Amazonian deforestation: landless migrants, colonists/small farmers, ranchers, drug traffickers/money launderers, gold miners, labourers/debt slaves, capitalized farmers, land grabbers (grilheiros), and sawmill operators/loggers. Their behavioural dynamics vary, and they may drift from one category to another, but all nonetheless contribute to the process of deforestation in their own way. For example, landless migrants usually arrive from other regions as whole families and settle down on unclaimed lands in hope of obtaining a legal tenure status by proving the "productive" land use to the authorities. They do not seek to clear large territories, but their numbers are significant, therefore the scale of their share in deforestation process is impressive, and their cheap labour is a huge contributor to economic attractiveness of deforestation. Other actors invest their money into agriculture and ranching (Fearnside 2008b). The vast areas available for clearing and weak law enforcement create a classic situation of the "tragedy of the commons" or rather "tragedy of the open access". Actors are free to cut and move; such environment is not very stimulating for developing a long-term logic based on sustainability (Wunder 2006).

3.3.8 Rent-seeking

In the economic and institutional setting, rent-seeking behaviour takes place when an association, company or individuals try to gain economic benefits without producing, working or investing effort in it (Murphy 1993). Rent seeking can be considered as detrimental to livelihood security, because when individuals are receiving a payment without working for it

and do not really understand the reason why it is received, their willingness to work and creativity in finding alternatives or better ways to improve their sources of revenue may be reduced. Following the arguments explained above, we can say that reinforcing internal capacities and developing local working forces is better than paying. Once individuals start getting money from government organisations to promote development, there is a possibility that they will start depending on it and therefore it may be prejudicial in the long term.

The fact that PES schemes provide a new an external economic incentive to local people can increase dependency on financial support by disrupting local dynamics and livelihood strategies. This however, depends on the level of the payment and how it is perceived by ES providers. It can also encourage unwanted behaviour in an attempt to qualify for the incentive, thus having adverse effects on local practices, not only in the area of the scheme but also in the surrounding areas. This can be compared to crowding-in, which entails the movement of actors to areas where monetary and non-monetary benefits are provided in order to receive them. However, crowding in does not necessarily entail rent-seeking behaviour, as the reasons behind moving can be both positive and negative. People may have the willingness to work and follow the rules in order to access the benefits, while others may simply act in an attempt to receive the benefits without any input efforts.

3.3.9 Alternatives to PES

PES schemes are not the only possibility to promote ecosystems conservation or to solve environmental problems. In many situations, other options like investment in education and more environmentally sustainable livelihood practices may be more appropriate to encourage environmental awareness than the implementation of a market instrument (Corbera et al. 2007). In this regard, educational activities offered by PES projects may play a positive role not only by fulfilling their primary goal – providing people with new knowledge - but also by bringing people together, fostering a sense of community, where responsibility for each others' well-being is important. Local dynamics and institutions are key elements in this issue, and must be addressed and understood in the design of the PES scheme, if it is to have the desired effect. If these aspects are ignored, the underlying motivation to change behaviour will not be affected, and the goals will not materialise. The PES schemes must be adapted to local conditions and cultural aspects in order to succeed.

Chapter 4 Methods

Introduction

The methods covered here include the research design and data collection methods employed during our fieldwork in the Juma reserve. The theory of abduction is presented, as it allowed us to accommodate new findings that arose during the research into the theoretical framework which guided us prior to the data collection phase.

4.1 Theory of Abduction

Abduction lies between the disciplines of deduction and induction when inferring theory and hypotheses from observations. Abduction unifies the logic of justification and the logic of discovery, where theory is both the guide and the outcome of research. This can provide valuable insights and prospects when investigating the reoccurrence of specific events, and explains how both observed and expected data can be used to create hypotheses (Bromley 2006; Magnani 2000). Abduction is closely linked to grounded theory, where data and theory are continuously checked against each other to determine the direction of the study and propose eventual observations (Bryman 2004). Bromley (2006) argues that "abduction starts when particular circumstances and events are encountered and we find ourselves in need of an explanation. That is, human action is animated, *ab initio*, by doubt or surprise" (Bromley 2006:11). By organizing known relations and specific assumptions, we can formulate testable hypotheses with the intent of explaining those events (Bromley 2006). By observing certain facts, C, we can assume that if certain occurrences, A, were true, then C would be given. Therefore we can assume that A is true, thereby explaining the occurrences of C (Argument adapted from Bromley 2006). This idea forms the basis of our research, as we compare theoretical PES criteria to the BFP in the Juma reserve, and from our findings deduct which arguments hold and which are irrelevant or even wrong in the case of the Juma reserve.

4.2 Research Design

The research incorporated the elements of cross-sectional/survey design and case study design based on ethnographic participant observation. An ethnographic approach provided a detailed and intensive analysis of the Juma Reserve, while a cross-sectional design included the possibility to reveal any variations between different villages within the reserve, and shed light on patterns of association between the variables we were investigating. It was beneficial for this research project to identify the degree of heterogeneity in attitudes towards forest protection that PES may cause among different communities. As the issue of unequal social relations may be a sensitive one, it was useful to supplement survey methods with observations of everyday community interactions under the participant observation framework. Immersion in everyday routine of the communities disclosed certain aspects overlooked when preparing for survey, this will be further addressed in the following section on data collection methods. For both methods, data was collected at a single point in time. The combination gave us more flexibility and the possibility to combine the various strengths that each individual research design holds. Each research design has certain limitations to collecting data. While case study designs are flexible and allow for changes, there is a reduced possibility to control variables, thereby making analysis of key factors a challenging task. The ethnographic participation approach is closely linked to time availability, meaning our relatively short presence in the field limited our possibility to gain deeper insight into the communities of our focus (Bryman 2004).

4.3 Data Collection Methods

Before initiating the actual field research, a thorough literature review was carried out, covering PES schemes and background information of the history and social characteristics of Brazil. All relevant information on the area, including state policy, history and modes of deforestation, agricultural activities, and income generation that was available was gathered in order to provide a better contextual basis for the research. A combination of qualitative and quantitative methods was used during the second stage of the study, though the emphasis was made on a qualitative approach due to the nature of the research objectives, as we were looking to understand opinions, meaning and behaviour patterns in the Juma reserve as well as to understand the context in which these arise.

The data collection instruments used during the fieldwork varied according to the nature of the research question. The operational issues, therein the design and implementation of the BFP, the design and distribution of the payment, as well as the costs of establishing and running the programme were covered by individual interviews with key personnel at the FAS office in Manaus, as well as by official documentation from FAS. Regarding the programme components and transaction costs, and the issue of how funds are directed through the system and reach the local level, we interviewed people in FAS who are involved in distributing and channelling the money and who have access to documents and data from FAS concerning this. On the community side we spoke to FAS members working in the field and community presidents concerning the implementation and running of the BFP on a local level.

The costs of participation for programme participants were gathered from household interviews with the Juma residents, which we also utilised to assess the relationship between the reserve and the BFP. Researcher observation and participation in daily life also played a large role in addressing the effect of these two, as well as aiding the assessment of local involvement. During our stay in the Juma reserve, we were able to talk to members of the communities, FAS workers, and state personnel responsible for the management of the reserve, along with others who had connections to the BFP and the reserve. This enabled us to explore various opinions on the progress in the area and establish theories of our own.

The implementation of the BFP and the effect of its resources on local livelihoods have been gauged by programme documentation provided by FAS, together with individual interviews with FAS workers. Structured questionnaires and semi-structured interviews with both households and individuals, and group discussions have also been used to try to determine the impact of the BFP on livelihoods, behaviour and attitudes towards the forest. Issues of how effective the programme is, and how participation of locals works was addressed by structured questionnaires and semi-structured interviews with residents, supplemented by researcher observation and participation.

Lastly, we assessed the level of satisfaction of participants of the BFP with individual and household interviews, as mentioned before. The satellite data and maps that show actual deforestation and changes in forest cover were obtained from FAS and The Ministry of Science and Technology in Brazil.

For full insight into the household questionnaire, please see Appendix I. For full insight into FAS' financial reports, please see Appendix II.

4.3.1 Sampling Techniques

Before commencing the fieldwork, we hoped to conduct a preliminary study of demographic data with the use of available information gathered by FAS during preparatory stages of project design. If there are significant differences between the villages, a balanced sample that includes communities with varying characteristics, such as size and income level, must be chosen. However, this information was not available from FAS, and based on their and our own observations, the communities are quite homogenous, varying almost solely in size. The sheer size of the reserve and the difficulties of transportation also made random sampling a challenge. These facts, along with financial conditions and time constraints, led us to use non-probability sampling (Bryman 2004). Once we accessed a community, all households that were available were interviewed, and those not present at that moment were interviewed later if we were able to locate the family.

In order to acquire a comprehensive picture of the design and implementation of the BFP, the representatives of FAS and community leaders were interviewed. In this case, the interviewees were not randomly selected, as their knowledge pertaining to the project is of primary concern to our research, and it is directly linked to the position they hold. For this reason a targeted selection was used (Bryman 2004).

4.3.2 Household Survey and Pre-Testing

Questionnaires were used in order to get a better demographic picture of the participants of the programme. Individuals and households were interviewed using in-depth structured and semi-structured interviews. Structured interviews were primarily targeted at questions pertaining to money use and livelihood strategies. Semi-structured interviews were applied to provide a broader insight into the effects of the BFP, as questions are designed in a more general manner and allow for more flexibility, and permit researcher to ask further questions in response to what may seem as more significant replies (Bryman 2004). The household surveys also helped gain partial insight into household economic activity and social dimensions of the area.

Closed-ended questions were used to cover the interviewees' background, such as age, gender, education, marital status, as well as household characteristics like family size,

cultivation area and crop production and sale, forestry use, and other income. These questions also covered participation in BFP information meetings and activities. Open-ended questions were used to assess attitudes and behaviour towards the forest and the environment both before and after the implementation of the BFP.

Preparations of the questionnaire for households started before arriving in Brazil and clarification of living conditions and practicalities were obtained from FAS to help us make our questions more concise and relevant. When we then arrived at the FAS Sustainability Base Samuel Benchimol in Boa Frente, in the Juma reserve, we worked closely with FAS personnel to determine if the household survey and questionnaire was suitable to the forest dwellers. Language and terminology was an issue, as many questions had to be simplified in order to capture the context of the situation and what we wanted to know, and ensure that the respondents understood our aims. Due to time constraints and transportation issues, we were unable to carry out testing. Before starting, we also hired a Portuguese-English translator, to ensure the quality of our questions. Preparation also included advice on how to act and behave around the interviewees, and social and cultural issues, which could make research hard and answers difficult to acquire. During our study, social aspects and new information arose that were unforeseen, and some few questions had to be altered where necessary, in order to obtain the information we were looking for. We ensured that this did not change the base of our data and make the results incomparable.

4.3.3 Focus Group Discussions

To assess differences between individual and community perceptions and other factors affecting perception and behaviour towards the resources, we included focus group discussions in our data collection methods. As Bryman (2004:346) notes “the accent is [placed] upon interaction within the group and the joint construction of meaning.”. This is valuable in the context of our study as we seek to contrast individual and communal motivations of following the rules of the project and attitudes towards forest protection. Before starting our fieldwork, our contact people at FAS had mentioned there could be opportunities to participate in work-shops and meetings organised by FAS, where we might have the possibility to organise discussions among the participants. Unfortunately these opportunities never arose, and our focus groups were reduced to family discussions that

occurred while we were conducting our household surveys and interviews. When interviewing household members, it was common for both husband and wife to answer, as they each had specific knowledge, for example pertaining to crop production and household purchases, respectively. On some occasions, the entire family would be present, thereby allowing for more discussion on the benefits of the BFP and the effect of the payments. We were also able to discuss how the forest dwellers perceive the recent changes in the area where they live, the importance of the creation of the reserve, and the future expectations and hopes they have for the BFP. With this information, results from individual interviews and focus group discussions will be compared to ensure reliability of the study.

4.3.4 Individual Interviews, Key Informants

We conducted individual interviews with people in key positions in the reserve and FAS to attain specific information on BFP components, as well as FAS finances and transaction costs involved in establishing and running the programme. These interviews also gave us insight into individual opinions of the programme, both of FAS and of the local level. Individual interviews and semi-structured interviews gave us the chance to pursue topics that arose during the interview, or that the interviewee brought up. It was also easier to get personal opinions, both from FAS workers and individuals in the reserve, who spoke more freely when interviewed alone.

4.4 Data Processing and Analysis

Quantitative data was analysed using statistics and variable analysis, to examine any correlations and relationships between different variables using frequency tables and diagrams, and multiple regression was used to see if there is any correlation between the level of satisfaction and the social factors that the former may be affected by, such as level of education, monthly household expenditures, income, etc. (Bryman 2004). Qualitative data was analysed using grounded theory, where data is systematically categorized, analysed, and compared in order to maintain a constant connection between data and theory conceptualization, where both are continuously checked against each other to ensure the direction of the research is not lost and interpretations are consistent (Bryman 2004). The

findings were repeatedly linked to the existing theory, which comprised the framework of this study. The qualitative data was coded where appropriate to be analysed in conjunction with quantitative data, while avoiding fragmentation of the information. We also used descriptive analysis, to capture the residents' situation and their understanding of it. Their answers can shed more light on the way the BFP works in Juma if they are understood in their context.

Quantitative methods were mainly used to interpret the effect of the payments on income distribution, as well as changes in income from the forest. Rates of deforestation in different areas of the reserve were analysed on based on the information from residents in conjunction with GIS data and satellite images supplied by FAS. Both qualitative and quantitative data were used for a descriptive analysis to capture the effect of the BFP on behaviour and attitudes towards the forest; and to determine if there was any change in the way the forest dwellers perceive themselves in relation to forest protection. This data was also able to tell us about participation and the effect of the BFP components for environmental education.

Generally, all data interpretation was done with the understanding of its context-dependent nature. Generalizations were avoided, however it could be useful to conduct a cross-analysis with other PES related studies in future and check if there are any similarities that could be categorized as relatively regular and context-independent.

4.5 Income Definition and Calculation

Our aim for the income calculation is to establish household income from forest products, both cultivated and gathered. By establishing this, it became easier to assess the impact of the BFP payments on real income. Total household income was calculated on a monthly average based on information gathered from household surveys. We asked for crop production, consumption and sale, as well as harvesting of forest products, and this information was used to estimate monthly income based on price information.

The calculation of income is based on figures acquired from interviewees, while these were hard to establish. After consultation with workers of FAS and other reserve personnel, we realised we could only use rough estimates, as many forest dwellers cultivate their crops spread out around their homes. Their measurements of cultivation areas and production can often be inaccurate, as they grow what they need to survive and do not always see this in

terms of standard units. We have chosen to use the term “quadra”, which is used by residents and FAS. This roughly translates to a block, which should be 100 m^2, yet it is difficult to confirm the actual size, since there are no exact measurements by the residents. Our income calculations asked for demanded prices for crop and forest products before and after the implementation of the BFP, but during our fieldwork we discovered that recent natural conditions had resulted in a price change for some items, making the impact of the BFP payments on income less clear. This will be addressed more in detail in section 5.2.3.

We have not included inputs in the form of labour or tools and necessities for production and forest harvesting. Salaries, pensions, government payments and support are not included either, as the focus of our study is limited to forest income.

Very few residents in the reserve use fertilisers, as slash-and-burn is still very common, although the creation of the reserve only allows one slash-and-burn per year. Other inputs such as tools are often made by the forest dwellers themselves, and labour is varying. Work often starts early morning and continues until just before midday, when the heat makes work impossible. When children are old enough they help their parents, and the whole family participates in field work and housework. We have not calculated input costs either, as these are also difficult to estimate (FAS 2010a).

4.6 Research Validity and Reliability

Reliability and validity are essential elements for assessing research quality. Generally, reliability is the degree to which the measure of a concept is stable, while validity entails whether indicators that are devised to measure concepts truly measure said concepts (Bryman 2004). As mentioned above, our prepared questionnaires had to be modified after advice from FAS workers and a better understanding of the context. During fieldwork there is always the possibility of errors in data collection, for example if questions, meanings, and answers are misunderstood during the interviews. Contradicting answers to control questions were a problem during our study, making data interpretation complicated.

Reliability and validity can be adapted to better capture the nature of and evaluate qualitative research. External reliability relates to the degree to which a study can be replicated. This criterion is particularly difficult in qualitative research, which often focuses on specific social

settings. Internal reliability means that if there is more than one researcher, the members must agree on what their observations mean. Internal validity is strong if there is a good correlation between the researchers' observations and the theoretical ideas they develop. This is strengthened by prolonged participation in the research setting. External validity refers to the degree to which the findings can be generalized and applied to other settings. This is also a difficult criterion as qualitative studies can often be based on small samples and exact occurrences (Bryman 2004).

While respondents should not be conditioned to providing biased information, most questionnaires were difficult to conduct without additional questions for answers, as many respondents had a hard time understanding our questions and our terminology. This may have affected the validity of our study. Any data that was not clearly recorded will not be used in the study to avoid the risk of researcher's personal interpretation. All information is authentic, collected from valid sources.

While our study has been focused on Juma alone, there are other reserves where our study could be replicated to look for eventual differences in project outcomes and household variables. Our research was focused, and we discussed our observations and theories regularly. Most of our interviews were conducted in pairs, making us better able to capture information and discuss the results. Our findings and ideas that we gathered along the way were noted and collected, and our work was processed at the end of each day while our memories were fresh.

4.7 Ethical Considerations

As mentioned by Stern et al. (2004) and Bryman (2004), there are several aspects to take into consideration concerning research and professional ethics. As with any research, it is important to ensure that those providing the information are doing so voluntarily and knowingly. All interviews were conducted anonymously, and this was made clear to the interviewees, in addition we made clear the nature of our study and our neutrality from the start. Most individuals spoke freely; some hoped we would convey a message to FAS, while a few were wary of reprisal. As researchers we had a personal responsibility to ensure that our actions did not undermine respondents' safety, whether physical or psychological, at any point in time, even after the fieldwork has come to an end, and the respondents' time and

privacy were of outmost importance during the fieldwork. Participation in the research should not be viewed as a burden and it should not compromise respondents' ability to carry out their daily routine.

Chapter 5 Analysis

5.1 Description of Study Area

The Juma Sustainable Development Reserve Project covers 589,613 hectares in the municipality of Novo Aripuanã, in the south-eastern region of the Brazilian State of Amazonas (see Figure 2 below). The Juma reserve is located 230 km south of the city of Manaus, the capital of Amazonas[28]. The town area of Novo Aripuanã is located about 10 km east of the northern boundary of the Reserve. The western boundary of the reserve is defined by the Mariepauá River, which forms the frontier between the municipalities of Novo Aripuanã and Manicoré. The southern boundary is defined by federal land (100 km north of Transamazon Highway – BR-230), and the eastern boundary is delineated by the left bank of the Acari River. The Reserve's northern boundary is defined by the Madeira River (see Figure 3 below) (FAS 2008a).

The Juma Reserve Project is situated in one of the two most important interfluvial regions in Amazonas between the Madeira and Purus Rivers. The average temperature is about 25º C, with a minimum temperature of 21º C and a maximum temperature of 32º C. The average annual rainfall is around 2.00 mm with 70% of the region's precipitation being concentrated in October and April. The region's average relative humidity is about 85%. Novo Aripuanã receives 2,000 hours of sun per year (FAS 2008a).

The Juma reserve has been recognized as an ideal location for biodiversity conservation. There is a significant level of biodiversity among reptiles, amphibians and mammals. The region is also well known for having a high level of flora and fauna biodiversity. The Juma reserve is characterized by a diverse number of habitats which have favoured the reproduction of an interesting variety and richness of species, especially birds and primates. Recently new species of fish and three species of birds have been discovered and more than one third of the all bird species (430 species) found in Brazil has been reported within the Juma Reserve's boundaries (FAS 2008a).

[28] Travelling from the Juma reserve to Manaus, one must first pass through Novo Aripuanã. From this town, there are fast boats that take 12 hours to reach Manaus, and tickets costs BRL 125 (about USD 60). The journey by slower boats, which the local residents use, would take up to 32 hours. During our stay, we only encountered two people who had visited the city of Manaus.

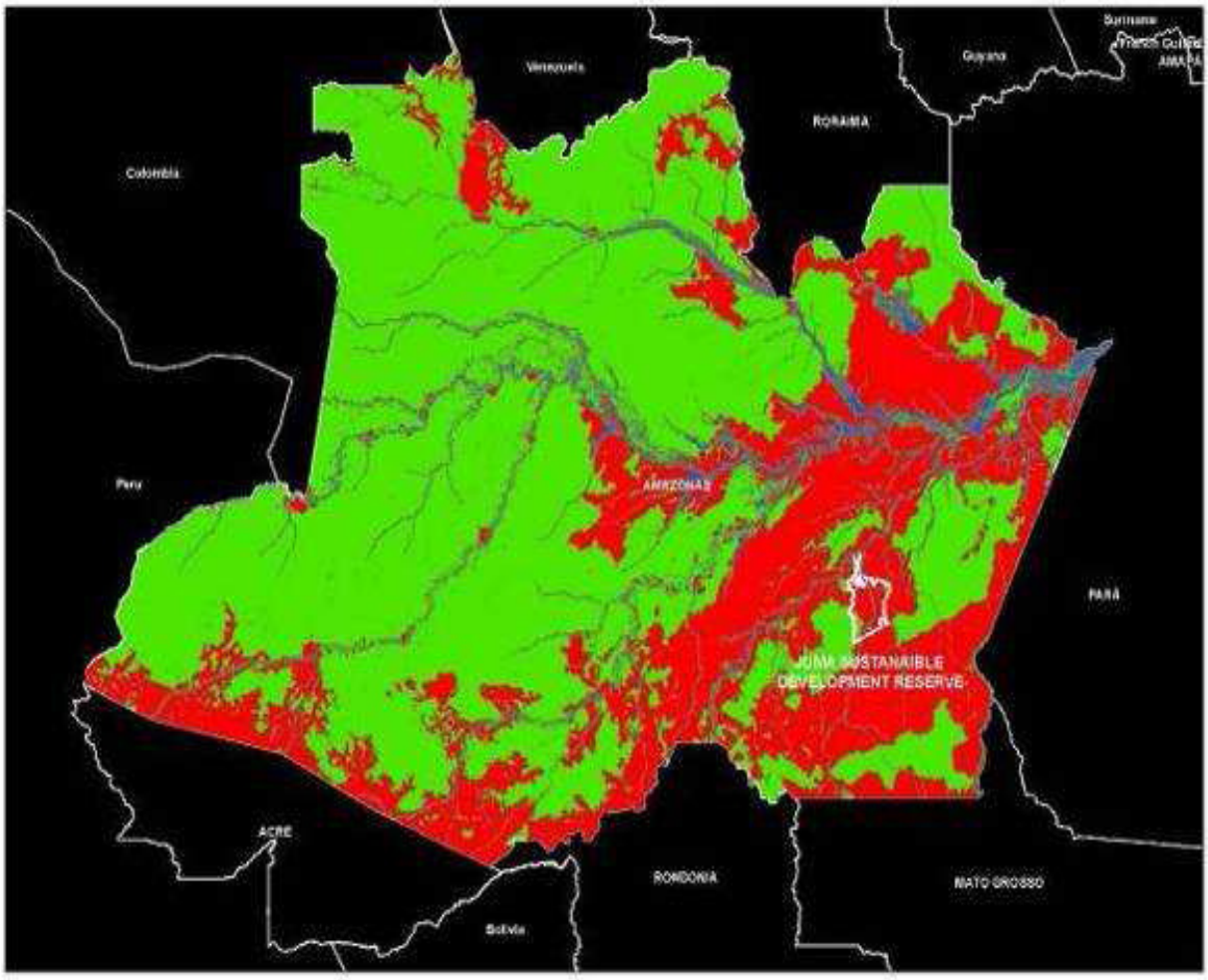

Figure 2: Map of Amazon State, Brazil, showing the Juma Sustainable Development Reserve marked in white (Red shows forecasted deforestation in the Amazon State by the year 2050 under the BAU scenario).

Source: Map is based on data obtained from the model SimAmazonia I (SOARES-FILHO *et al*., 2006), in (FAS 2008a)

According to the simulation models of deforestation that were designed by the Institute for Environmental Research in the Amazon (IPAM), the municipality area is located in a high deforestation risk area, and if the Juma reserve had not been created, the region would have experienced paving of highways substantially by 2050, as the AM-174 highway cuts through the right-hand side of the reserve (see Figure 3 below) (However, as of 2007, a little over 1% of Juma reserve forest has been cleared. These minor clearings can be explained by small-scale agriculture for internal consumption and in many cases low production of products for sale. Forest interruption on the Novo Aripuanã-Apuí road is a result of illegal extraction of timber by outsiders (FAS 2008a).

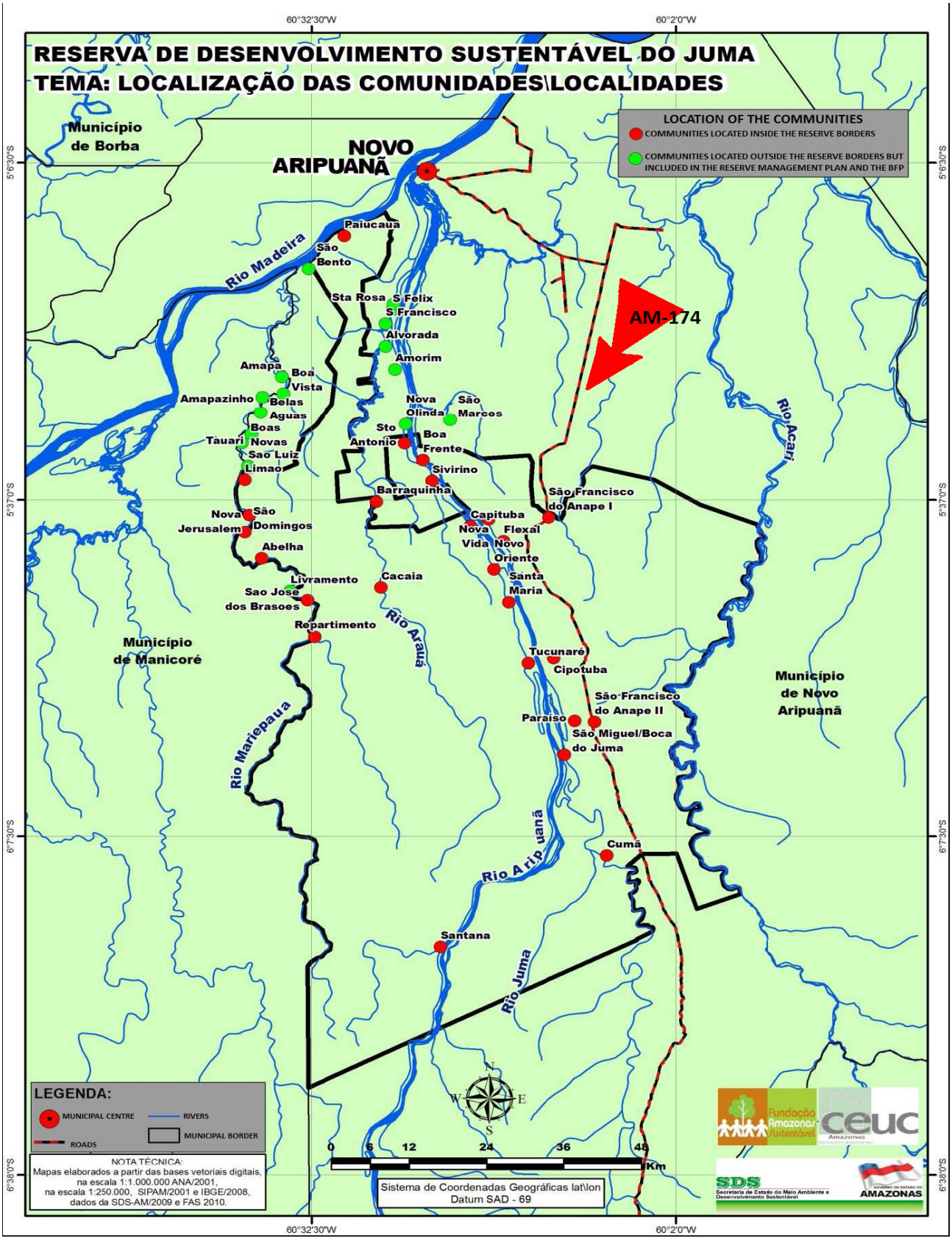

Figure 3: Map of Juma Sustainable Development Reserve, Amazon State. Source: (FAS 2010a)

As reported by a social survey carried out in July 2008 by the Amazon State, there are 385 families residing in 44 villages located within the reserve and its adjacent areas. The inhabitants of the reserve are not indigenous people; they are local communities, and the language spoken is Portuguese.

The population in Juma is quite homogeneous, both in lifestyle, culture and religion, and very few of them have a job in the city or travel to finish their education. The 44 villages of the Juma reserve are mostly made up of an extended number of families and often several families live together in the same household. The communities are characterised by social and economic challenges due to poor education opportunities and isolation from further possibilities due to long distances and low income. It is common for girls to get married and become pregnant at a very early age. Alcoholism is another serious issue within the members of the communities in Juma.

In nearly all the communities in the reserve there are state schools. These only provide the first four years of schooling, and as a result the education level is very low. The distances from communities to the city are very long and many parents do not want to let children live away from their homes. The school classes are made up of students of different ages and educational levels, which makes teaching difficult. These schools must not be confused with the schools that FAS are constructing as part of the BFP, which cover the next three years of education, and will be addressed further in the analysis chapter.

The health system is not well organised and there are no properly trained medics. First aid is given by the community members based on traditional knowledge or basic instruction provided by the local municipality. The most frequent health problems are malaria, diarrhoea, verminosis, malnutrition, flu and hypertension. The more serious illnesses or health problems are treated in Novo Aripuanã and residents have to transport sick or injured people in "rabetas", which are wooden canoes with small motors (FAS 2008a).

Living conditions are simple; most of the houses are made of wood and the roofs are made of thatched palm. The communities do not have sanitation systems or a trash collection system. Very few families have generators, and those who do not have them depend on kerosene for illumination and firewood for cooking. The communities rely on subsistence agriculture of a few basic plants, fruit collection and other forest product harvesting, and fishing and hunting.

The main crop cultivated in Juma, and which also represents the largest share of their goods for sale is manioc, a root vegetable, which is one of the most appreciated local products. Manioc is used to make farinha (manioc flour), which is a commonly used throughout Brazil as a side-dish for meals. Among the most common fruits collected are pineapple, bananas, mango, and açaí – which is a palm fruit. Fishing is the major basis of protein for the inhabitants of the communities. Other forest products such as copaiba oil (an oleoresin with medicinal properties) and pau rosa (a plant whose oil is used in perfumery) (FAS 2008a).

The majority of the people within the Juma reserve work in their cultivation areas, which are most often based in secondary-growth forest areas locally called capoeiras, growing their own food for self consumption. The excess production is for sale; which is the main source of family cash income, along with the sale of forest products. Fertilisers are not commonly used in the area, and most farming tools used are produced in the community. Working in the forest is not an easy task, as hot and humid climate conditions and the dense vegetation of the Amazon forest make labour very hard. For this reason, once families have established their cultivation areas, they seldom move to other communities (pers. mess. Viggiani 2009).

During our stay in the reserve, we heard from FAS personnel that the population in the area is called “caboclo”, which is a term for descendents of indigenous tribes and former African slaves. The population in the reserve today are also descendents of those workers forced to labour in rubber plantations, which existed in the area during the post-colonial era. It can be argued that this concentration of labour resulted in the loss of environmental and indigenous knowledge, and the population moved away from a traditional lifestyle which indigenous tribes had. This has resulted in the loss of a large amount of knowledge concerning plants and forest resources, as well as cultural ways of life and language. One FAS worker who has knowledge about indigenous peoples in Brazil, emphasizes that the communities in Juma could be cultivating up to 20 different crops, but currently only are familiar with four or five plants and crops, which further affect their alimentation and quality of life (pers. mess. Schwade 2009).

Most of the land used for cultivation by the local populations, are today located in these areas that were previously plantations and that are therefore easier to cultivate than primary forest. It can thus also be argued that the plantations concentrated labour efforts on those crops that were more economically profitable, and not those that were more diverse and thus better for

the labourers and the environment. Having mentioned this, it is also important to note that agriculture in the Amazon is not purely negative for the forest, and has resulted in the formation of rich soil layers; it is the lack of diversity which is an issue (pers. mess. Schwade 2009).

The majority of the families residing in the Juma reserve do not have land titles, and some lack personal documents, i.e. CPF – the Brazilian Personal Identification Number (Cadastro de Pessoas Físicas). The Amazon State owns the land and it is protected by law, while local communities have the right to occupy it. The introduction of the BFP by the state has put forth a new discourse, where local communities are recognized as forest guardians as they perform conservation and monitoring activities; therefore they have the right to receive payments for environmental protection. The State of Amazon has recently introduced the country's first ES legislation, as mentioned in chapter 2.4. (FAS 2008a; pers. mess. Viana 2009).

In the survey mentioned above, which was made prior to the establishment of the Juma reserve by the Amazon State, more than half of the families informed to have an income between BRL 200 to BRL 400 (or USD 100 and USD 200, correspondingly). Few family members informed having an income three times higher than the minimum wage (BRL 450 or USD 225), up to BRL 1350 (or nearly USD 700). The central economic activities are extraction and sale of Brazil nuts, manioc flour, copaiba oil, and timber. Some families have chickens, ducks or sheep for self consumption. The communities depend on rabetas, which are the most common transport to go to the city for selling products, fishing or travelling to neighbouring communities (FAS 2008a).

5.2 Fieldwork Description

During our fieldwork we were based in Boa Frente, a community consisting of around ten houses situated on the Rio Aripuanã. Here, FAS have constructed a school - J.W Marriott Jr. - that offers education from 5th to 8th grade, alongside housing for students and teachers, a health station, and housing for FAS staff, researchers and other visitors to the reserve. This constitutes the Sustainability Base Samuel Benchimol. The school was built in cooperation with the State of Amazonas Secretariat for Education and Teaching Quality (SEDUC - Secretaria de Estado de Educacão e Qualidade de Ensino), which is the institute responsible

for education programmes and systems in the Amazon State. From there we were able to visit other communities along the river and conduct our study. Out of the 44 communities located in the Juma reserve and its surroundings (see Figure 3 above), we were able to visit 11 along the Rio Aripuanã and Rio Arauá. Other communities situated along Rio Mariepauá could not be visited due to large distances and low water levels in the rivers, making entry by boat impossible (see Figure 3 above). Fortunately we attained interviews with residents from six of these villages during our last days in Novo Aripuanã, as many of them had travelled to the town to participate in a government programme.

We had hoped to achieve a larger sample of communities from the other rivers in the reserve, in order to see if there are any differences in behaviour, attitudes, satisfaction, etc., especially as the BFP seems to be at a further stage of implementation near the FAS base in Boa Frente than in other areas of the reserve. However, we will attempt to use our data to see if any such differences can be seen

In total we conducted 96 interviews. We aimed to interview mainly the female heads of the household, as these are the direct receivers of the individual payments. Women were also more readily available, as they stay at home taking care of the children while their husbands work in the fields. However, we were often joined by the male heads of the household, as they knew more about crop and forest production and sale. In some cases it was also the men who knew more about the programme and more often attended the information meetings by FAS, so interviewing both completed our questionnaire. In the cases of widowers and divorcees, we also interviewed men. The ages of our interviewees varied, though none below 18 years of age, as they do not qualify for the payments. This is part of FAS' attempt to discourage marriage at younger ages, and enable both girls and boys to complete their education.

We would like to mention that all figures presented in the following chapters are based on the 96 interviews that we conducted. However, in some cases the respondents offered several answers to the same questions, this will be specified in the text in relation to the numbers we present, and in the actual charts. Some questions were also only relevant for some of the interviewees; this is also specified in the text and the charts.

5.2.1 Limitations of the Study and Assumptions

The limitations to our study are determined by the fact that the BFP is new, and one may need to allow more time in order to make legitimate conclusions about real changes, both environmental and social. We expect that differentiating between impacts of establishing the reserve, introducing payments and the effect of participation and education on behaviour and attitudes of the reserve dwellers will be a challenge.

In order to ensure avoidance of flawed conclusions, we hoped a control group could be used. Demographically, geographically and economically similar communities can be found outside the reserve, and their livelihoods and forest management practices should be very similar to those of the communities within the Juma reserve prior to their inclusion in the project. However, we were unable to contact these communities, due to safety issues and financial constraints. The communities beyond the reserve are mostly beyond the scope of FAS, and political and economic situation in this area made approaching them unadvisable without supervision. FAS personnel were unable to produce this for us, and we were warned not to approach communities without their or other local aid.

As mentioned briefly in chapter four, our selection methods of interviewees were limited by travel restrictions. The majority of our interviews are from the river Aripuanã, were we were based during our fieldwork. In order to access other communities, we were dependent on the assistance of FAS and access to a boat to transport us to the communities and take us back after we had completed the interviews. Hence, most of our interviews are also from the communities that are closest to Boa Frente (see Figure 3, chapter 5.1). Once we arrived at a community, we interviewed all households where people were at home. Most of the communities we visited had approximately ten houses, and we could usually access from five to eight of them. Those we missed were either working in their cultivation fields or away, most likely in the town of Novo Aripuanã, where we found out many have houses or stay with relatives. We often waited to see if people who were out in the forest working would return, so we could complete more interviews. We thus tried to cover all the households we could in the area, and during our stay in Novo Aripuanã, we often found those families we had missed during our visits.

We must however mention that communities located along the river Aripuanã that are not physically located within the reserve are nonetheless included in the BFP by FAS, as well as

being included in the management of the reserve (See Figure 3). FAS justify this by arguing that excluding these people, who are closely linked to the communities within the reserve boundaries, would only harm the programme's aims of life quality improvement and reduced deforestation. By keeping these communities involved, the project's aims are more attainable, and leakage becomes less of an issue for the reserve (FAS 2008b). Besides these communities, there are few others in the vicinity of the reserve.

Time constraints also reduced the possibility to study the effects of BFP and how residents of the reserve interact. We could not remain in the reserve without the supervision of FAS, who unfortunately could not stay more than a month with us in Boa Frente.

Lastly, our research could also be limited by the fact that the residents could have associated us with FAS, and therefore could have acted more restrained around us and avoided truthfully answering all our questions, in the case they were afraid of reprisals from FAS or that we would give the information to others. Although we introduced ourselves as neutral and emphasised that we did not work for FAS, we were always accompanied by FAS personnel to the communities, and spent all our time in the FAS base in Boa Frente.

5.2.2 Representativeness

On average, each community has roughly ten houses, though not all are occupied continuously. The smallest community has two houses, while the largest has 28 (Rio Mariepauá). In total we interviewed 96 households out of a total of 385 included in the Juma reserve (FAS 2008a). This represents 24.9% of the reserve, and while this is a small sample, the group from which we selected is also very small, and our sample can be considered to be representative. Note that the population is also quite homogenous.

During our fieldwork we also encountered many families living together in one house. While these are counted as separate families by FAS, we opted not to interview all members receiving payments from the BFP, as the other data concerning production and income would be identical and reduce the variations of variables in our sample. However, it can then be said that we have covered more that the recorded number of interviews, and we could therefore assume that the representativeness of our sample is high.

5.2.3 Household Information of Interviewed Communities in Juma

This section covers household information concerning population, income, and education levels of the interviewed households in the Juma reserve.

Population

The population that lives within the borders of the Juma reserve is 1055 people, divided between 25 communities that hold in total 245 families; however there are 640 people outside the borders of the reserve which are grouped in 19 communities that hold 140 families in total, that use and also depend on the natural resources from what is today the Juma reserve. There are no reported internal conflicts between these communities (communities located inside of the reserve and those located in adjacent areas). Because these communities are and have always been users of the same resources located inside the reserve, they have been included in the management of the Juma reserve and in the area that the BFP covers. If one includes the communities that lie on an outside of the borders of the reserve, the total population is 1695 people grouped in 385 families divided between 44 communities (FAS 2010a).

We interviewed 96 families in Juma, and the findings show that the population is basically young. Out of 96 people, 58% are below 39 years of age (see Figure 4). This can be explained by pregnancies at a young age, which is a cultural and social issue in these communities.

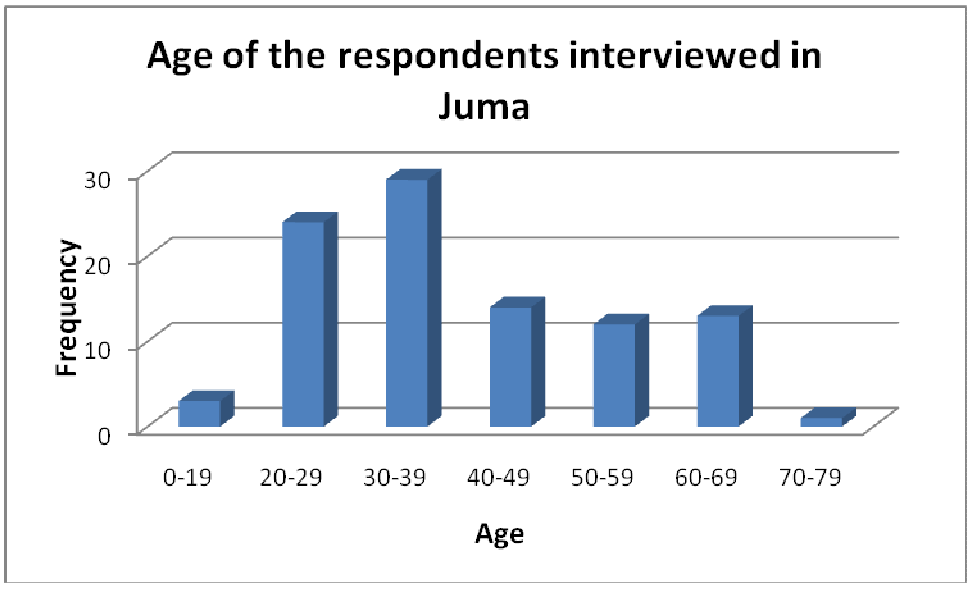

Figure 4: Age distribution among interviewees in Juma.

Education level

The education level of the respondents is low. Out of 96 respondents, 21% are illiterate, 61% have completed or are at the moment studying the first four years of basic primary education, 17% have taken the second level of basic primary education, and just 1% of the interviewees have studied at least one year of secondary education (see Figure 5). Before 2008 there were no schools that provided the second level of the primary education and secondary education located within the Juma reserve (FAS 2010a).

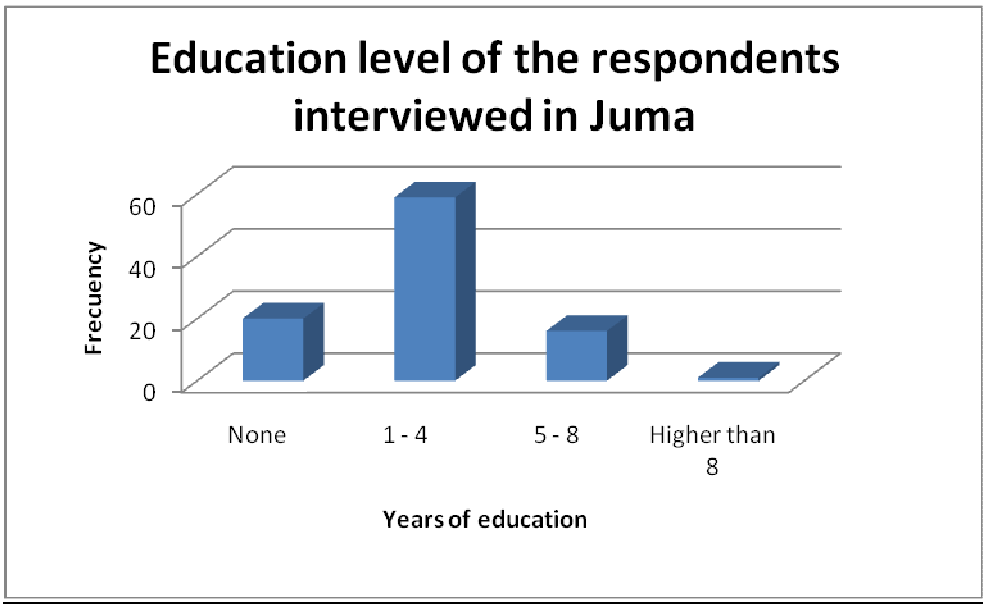

Figure 5: Education level of respondents interviewed in Juma

Income

The total income of the residents in Juma is based on subsistence from agriculture and forest product harvesting for own consumption, cash income from sale of agricultural crops and forest products, and cash income in the form of government support.

The cash income report that will be presented in this section is related only to the sale of agriculture production and forest crops. Other government economic help, social benefits (Bolsa Family, retirement fund) and salaries were not included since in many situations it was very hard to capture the precise amount of it. Very few people in the Juma reserve reported receiving pensions, while nearly all families receive *Bolsa Familia*, a government supported

programme for poor families in Brazil. The programme consists of several components to low-income families[29], and grants support for family expenses provided that the children attend school (Ministry of Social Development and Fight Against Hunger 2010).

The cash income of the respondents is mainly dependent on crop sale and forest products. At the time of our fieldwork we received information about the production and consumption patterns of various products, among them farinha, beans, pineapples, bananas, sweet corn, watermelon, coffee and others. The forest products that we found to be most common were Brazil nuts and copaiba. However we did not receive precise information about production and consumption patterns of all of these products, since many of them are mainly produced for own consumption. The product that is sold the most is farinha, and the forest product that is most sold is Brazil nuts. The other items mentioned are sold to some extent, but varyingly among the residents, and are mainly used for own consumption. We do not know if farinha is sold more due to its higher price than other crops, or because the residents traditionally have always produced larger amounts of this product. The sale of forest products is more dependent on availability in the area, and can vary a lot among the communities.

Since farinha is the product that the residents of Juma depend on the most, we could receive more information about it. According to the information provided by the residents, the average monthly consumption of farinha for each household was 1 ½ sack. At the moment of our fieldwork the price of this product was between BRL 90 and 120 per sack, rising from BRL 25 to 35. After talking to residents and FAS, we discovered that this increase was due to flooding from last year that had destroyed many crops that were located close to the river. The reduced production had now sent prices rocketing, and many Juma residents experienced double and sometimes triple increases in the prices they are paid for their farinha. We also noted that the price of Brazil nuts had risen, but we could not see that this was related to the creation of the reserve or the implementation of the BFP, but due to better organisation of workers in the area (pers. mess. Viana 2009).

Our income calculations include not only the information received on farinha, but also other crop and forest product information that we could gather. Among the forest products there are Brazil nuts at BRL 8 per tin (20 litres) and copaiba oil at BRL 6 per litre. In relation to the

[29] Low income families are defined as earning between BRL 70 and 140 per month per person (Ministry of Social Development and Fight Against Hunger 2010)

crops there are bananas at BRL 4 per head and watermelon at BRL 3 each. We could not gather accurate prices for other products, which were mainly intended for self-consumption.

The Family component was not included in the calculations either since we wanted to see if there were any other factors affecting income, and see if the payment had any direct effect on income from agriculture.

The findings show that out of 96 households interviewed, 72% have a monthly cash income from sale of up to BRL 200, 17% between BRL 201 and BRL 400, 5% are among BRL 401 and BRL 600, 4% are from BRL 601 to BRL 1000, and lastly less than 1% (only one family) perceiving an income of BRL 2000 (see Figure 6). Sixteen respondents from our sample reported not producing anything for sale, usually due to old age, having relocated to town, or other reasons, thus the group representing the lowest cash income level from sale is skewed.

Although most residents are located below BRL 50 per month, and the average of cash income is BRL 204. These figures represent the known cash income of the households. In addition there is a cash income which we do not know, based on government support such as Bolsa Famlia, pensions, salaries, etc. Based on our observations, not many residents seemed to receive pensions or receive salaries from employment, although most families receive Bolsa Familia. This financial support programme can vary between BRL 22 to 200 depending on the number of children in the family and their ages (Ministry of Social Development and Fight Against Hunger 2010). From those that mentioned receiving this support, most of them got roughly BRL 100, but this is not a precise number due to lack of information. We also estimate that the level of pensions correspond to an average minimum wage in Brazil, which is around BRL 450. Based on this, we could estimate that unknown cash income is less than cash income from sale, perhaps as little as half.

In addition, the households produce and collect crops and forest products for own consumption for a certain value each month, which we have not managed to determine. This is due to lack of information, as many residents mostly consume based on their needs, and were unclear about the actual amounts. In addition, families can help each other if extra labour is needed, in return for a share of the produce, thus making the amounts even harder to determine.

Income can be high due to high prices of farinha. The value of the other items that are mainly produced for consumption is difficult to determine. Based on the average income of BRL 204,

and that most families consume around 1 ½ sacks of farinha per month (which is then worth BRL 135 to 180), we can conclude that the income from subsistence is more than the cash income from sale, as in addition to the value of farinha, which is known to us, there is also the value of all other self-produced fruits and vegetables consumed within the household. In total we could estimate that cash income from sale is less than half of total income, income from subsistence is more than half, and thus other cash income from government support is a smaller fraction of total income.

In relation to these observations, the value of the Family component payment becomes clearer. If we assume that known cash income averages BRL 200, while government support averages BRL 100, and that the subsistence income is larger than cash income from sale, i.e. roughly BRL 300, we could arrive at an approximate estimate of total income of BRL 600. In relation to this, the payment then could represent between 10 and 15% of total income, which is not a lot in the scope of altering income level and adding financial security. These numbers are solely for giving an idea of the payment in comparison to income, and can vary depending on levels of production, prices, and if the household receives government support.

When compared to cash income from sale however, it represents 25%. Hence it can be understood that those not living in the reserve could regard the payment at a level that represents a large bonus to the residents. Yet for the residents, the payment is regarded as a small contribution in comparison with the values of their activities. Thus it would seem that FAS have been able to set the payment at a level which does not encourage dependency, as they planned. In addition, average spending among the households in Juma is roughly BRL 300 per month, and this number has not changed significantly since the implementation of the BFP. In relation to this, the payment represents an increase of 16% in purchasing power. This could have a positive effect on what the households can afford.

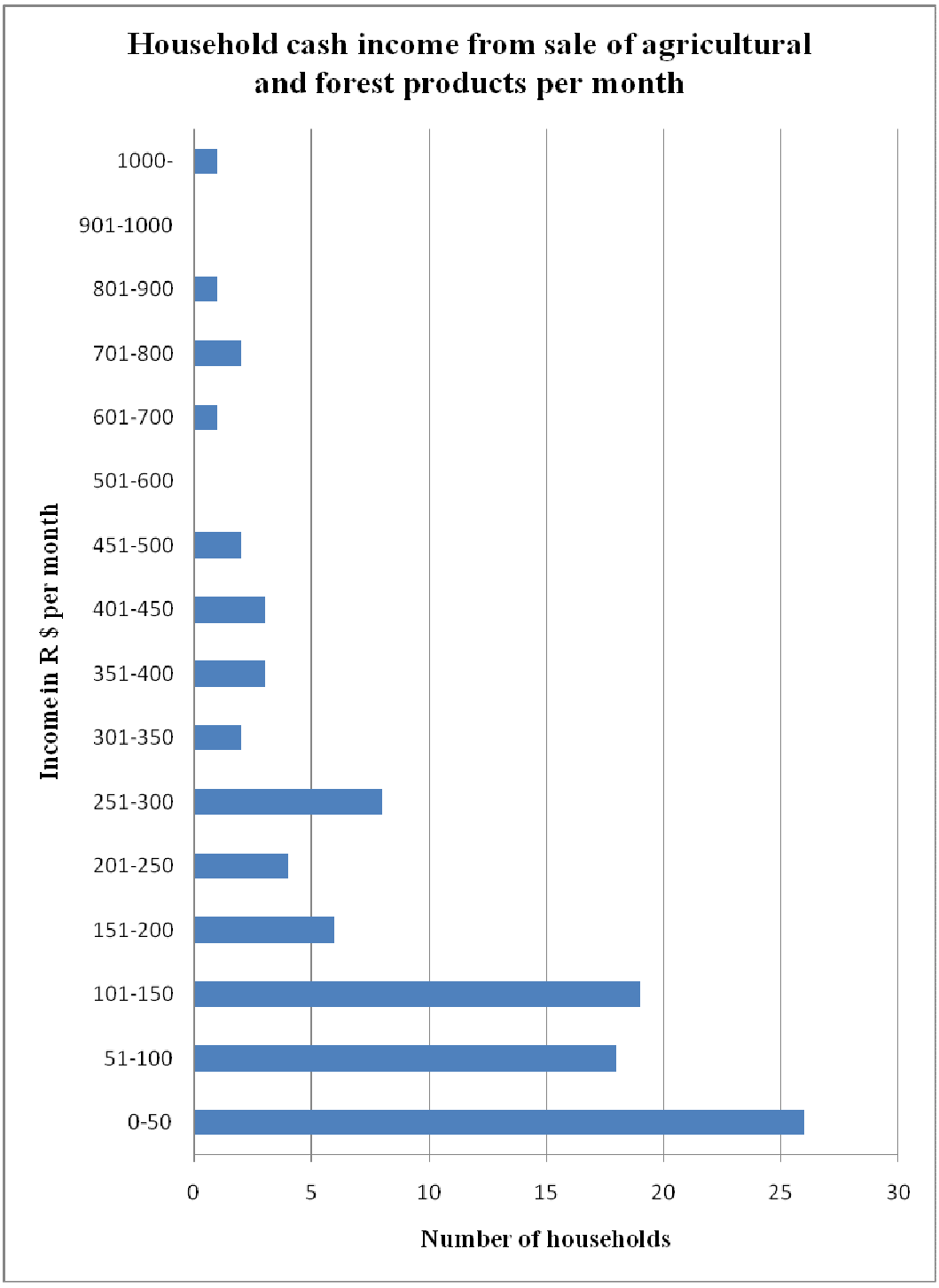

Figure 6: Income distribution of households interviewed in Juma

5.3 Operational Issues

This section covers the design and operational issues of the BFP and FAS, following the structure of the research questions from chapter 1.6.

5.3.1 How was the BFP programme introduced into Juma over time?

The BFP did not come into effect until new state laws were passed in 2007, as mentioned in the background chapter (see section 2.4), although the discussions concerning the implementation of the BFP started in 2006 (pers. mess. Viana 2009). The implementation of the BFP in Juma was divided into two phases. During the 1st phase, from September 2007 to April 2008, the BFP was implemented in several reserves by SDS, and entailed a socio-economic assessment of families in communities, looking at energy, education, and health situations. This phase also included the social mobilization of residents for participation in the BFP; conducting information meetings[30] to introduce the programme, its rules, the reasons for its creation; committing and signing the Terms of Contract of the BFP; and lastly initiating the Family component. During the 2nd phase, starting May 2008, the other three programme components were initiated. These were organised in connection with an agreement between FAS and AFEAM – the Development Agency of the Amazon State (Agência de Fomento do Estado do Amazonas)[31], and work-shops organised solely by FAS commenced in June of that year. The goal of this phase was to increase participation and registration of families for the BFP (FAS 2008b).

Within five months, the number of families registered in the programme rose from 971 to 2702 for all the conservation reserves, including Juma, which translates to an increase of 278%. By the end of 2008 FAS had delivered 4182 bank cards to all the reserves where the BFP is implemented, far surpassing their goal of 4000 families (FAS 2008b). The current number of families benefitting from the BFP in Juma is 321 (378 are registered as qualified

[30] The information meetings that FAS offers are part of the agreement made between the organisation and the participants of the BFP. The information meeting must be attended in order to receive the payments, and FAS uses this opportunity to explain about climate changes, the details of the programme, new activities and future plans and expectations. This is supposed to give the residents a better understanding of the changes that are happening in the reserve, and also make them more aware of their rights and the role they play.

[31] AFEAM works for the socio-economic development of the Amazon State through technical support and actions that generate employment and income, and improves the life quality of the Amazon public

for receiving the payments, but are not benefiting yet due to lack of required documentation) (FAS 2010b).

Currently, only the Family component is fully implemented in the Juma reserve. The remaining three components are still in the implementation phase, and are concentrated near the FAS base in Boa Frente. After talking to FAS personnel, they assured us that they have further plans to extend the BFP to the entire reserve, and courses from the Income component are planned. For further information regarding this, please see section 5.3.2.

5.3.1.1 What is the functional relationship between the Juma Reserve and the BFP?

Interviews with FAS personnel and satellite data on deforestation in the area where Juma is located reveal that deforestation is a future threat to the reserve, due to the reserve's relative proximity to other state borders and a strong presence of loggers in the area. In addition, the location of the federal highway AM-174 could imply that Juma is under threat from the impacts of deforestation as infrastructure improvements are made, and as it creates easier access to the forest, thus allowing logging actors to enter. Francisco Pinto, Main Coordinator of the BFP at FAS, suggested that if it were not for the reserve and the presence, participation, and commitment of the residents, deforestation would be much higher in this reserve. Burning still occurs in the areas adjacent to the reserve, disclosing a continuous threat from outside. On the other hand, the BFP also seems to support and strengthen the creation of the reserve. The two share similar rules, including forest extraction zoning plans, prohibited logging, limitations on cultivation areas, and reduced slash-and-burn practices to yearly events. Due to the distance between the areas in the Amazon State, FAS provides aid to government organisations, with funds, equipment, staff, etc, as they generally lack instruments and manpower to control and monitor these areas (pers. mess. Pinto 2009).

The reserve gives the BFP a possibility to grow, taking into the consideration the limited resources available to manage and monitor the reserve. Thus it is important to involve the local residents in taking control and protecting their resources. Illegal activities were an issue in the area that is now the Juma reserve, but it involved communities due to social and economic reasons. The establishment of the BFP, which gives people an alternative to income strategies, and brings benefits for the entire community, as well as the legal status of the reserve to deter illegal activities, can provide an opportunity for communities to better protect

their resources. The BFP gives FAS the possibility to mobilize people and inform them, by setting a social agenda. This is done through the Association component, where community organisation is encouraged and strengthened, and through several meetings where the residents are informed of their rights and responsibilities to protect their resources. If the reserve existed alone, there would be no information flow and people would not be involved, reducing the chance for social development. The goal to reach zero deforestation is also only politically possible within the reserves, due to the economic interests and land title issue that lie behind deforestation (pers. mess. Cristo 2009; pers. mess. Pinto 2009).

A strong environmental and civil movement in Brazil has led to the creation of many reserves, strengthening communities to protect their rights and develop new opportunities. Favourable socio-political conditions enabled Virgilio Viana, General Director at FAS and previous Secretary of Environment for the Amazon State, to actively participate in the process of state reserve demarcations in the Amazonas, and at the same time seize the opportunity to design the BFP and create FAS, as the potential for receiving financial support also seemed very good. FAS assume that without the BFP, the communities would feel much more isolated and possibly ignored by their government. One FAS worker clearly expressed that since these communities are so isolated and difficult to reach, that the government often does not see their value as they do not represent an important group during elections. This fact can also explain why these areas are lagging behind in terms of education, health and other social benefits, as they can be easily overlooked by politicians. This point of view is something we feel that the residents of Juma share, they do not receive enough help from their government and those responsible for improving their life quality. The payments imply that the residents' role in forest protection is acknowledged by recognizing their capacity, and involving them and valuing their services (pers. mess. Schwade 2009).

5.3.1.2 How were the local residents of Juma involved during the establishment of the BFP?

During the design and implementation of the BFP for all the conservation unit reserves, including Juma, several actors were involved and local residents were consulted. Cooperation between state secretaries and representatives, socio-environmental movements like CNS – National Council of Rubber Tappers (Conselho Nacional dos Seringueiros), GTA – Amazon Working Group (Grupo de Trabalho Amazonico), and COIAB - Coordination of Indigenous

Organisations of the Brazilian Amazon (Coordenação das Organizações Indígenas da Amazônia Brasileira), as well as indigenous associations aimed to represent and include the forest communities. These organisations together form the Alliance of the Forest People, which can represent local points of view and interests in such matters. The geographical constraints coupled with the difficulties in accessing the residents made inclusion of all participants in the design and implementation of the BFP economically impossible. However, when we talked to FAS about this issue, they argued that they had included all interested parties in the best way possible.

In addition, during the first contact, before registering members and families for the BFP, FAS approached all communities to discuss the programme, the organisation, why they were created, what the programme entails, what climate change is, among other issues. The meetings that took place with the communities meant they, as concerned parties, could better understand and form an opinion of the project (pers. mess. Pinto 2009; pers. mess. Viana 2009; Viana, V., Cenamo, M., Ribenboim, G., Tezza, J., Pavan, M. 2008). Nonetheless, the communities were not included in the actual design of the BFP, and could only form an opinion based on what was presented to them by FAS.

FAS initiated contact in the reserves by visiting the communities, to explain about the project and invited them to participate in information meetings and register for the payments of the Family component. After the information meetings which are a three day process, FAS returned within 45 days with the debit card registered in the name of the residents, who can then go to the nearest town and extract the money. The payments were thus the first part of the BFP to start, and the component has been running for 1 ½ years at the time of our fieldwork (pers. mess. Pinto 2009). FAS personnel state in interviews that the payments were chosen as the first component to be introduced to the reserve forest as a strategic objective to create interest in the BFP and an interest in participation, as well as a stronger sense of community and group belonging among the programme participants. FAS see the Family payment as a stimulus to promote participation and to build trust between the organisation and the residents of the reserve. FAS argue that based on past experiences, forest communities have been disappointed by public politics and promises made on behalf of the government, and are thus wary of new initiatives. The organisation's continued presence in the reserve contributes to a better perception of the BFP, and higher rates of acceptance among the residents (pers. mess. Netto 2009; pers. mess. Pinto 2009).

5.3.2 How is the BFP programme designed concerning the distribution of the resources from the main donor to the recipients?

The analysis in this section is based on reviewing the individual interviews with FAS personnel and the residents of the reserve, as well as our personal observations. These testimonies have been supplemented with the information collected from financial documentation related to FAS activities and from the Juma Reserve Management Plan (see Appendix II for financial reports).

According to the agreement between FAS and Marriott International – the sole sponsor of the BFP in Juma – financing of all four components of the programme in the reserve during the years 2008-2011 is – as already mentioned – supposed to be covered by the annual donations of USD 500,000. It was expected that each Marriott guest would opt to pay USD 1.00 per night in addition to the overnight fee; however this arrangement could not be carried out at the reception desk due to technical issues. Instead it was decided that donations could be made through the Marriott's website; the minimum donation option available is USD 10.00. Such approach has turned out to be less effective, as not all guests are willing to make an extra effort to visit the website; in addition USD 3.00-5.00 from every USD 10.0 donated go towards the system maintenance. So far the funds transferred by Marriott International towards the project execution could not cover all project costs. Thus in order to continue with the BFP in Juma, the missing funds had to be replaced from the common pool designated towards the execution of the programme in the remaining 13 conservation units. These particular funds come from the additional support provided by Bradesco towards FAS' general operational costs as well as expenses associated with the investment into the three programme components: Association, Income and Social (pers. mess. Villares 2009).

5.3.2.1 What is the distribution scheme for the BFP?

The funds from donors of the BFP in Juma are distributed to the residents via four components of the programme: the Family component, Social, Income and Association components. Table 1[32] below introduces the scheme of distribution of financial resources

[32] * in table marks exchange rate used by FAS in 2008: USD 1 = BRL 2.0389
** in table marks exchange rate used by FAS in 2009: USD 1 = BRL 2.1815

among the four components of the programme. The table presents the method of calculation upon which FAS base their logic for per-component disbursements for the BFP in general, followed by the per-component projections based on the figures relevant only for the Juma reserve. The actual amounts, invested in each component since the beginning of the programme up until December 2009, are reflected in the "Actual Expenditure" section and are based on the figures presented in the financial reports. The last two sections of the table cover the funding received in the period from April 7th to December 31st 2008 and during 2009. The money was received from the main donor of the BFP in Juma – Marriott International – as well as from additional contributions made by FAS through redistribution of funds provided by Bradesco bank towards the implementation of the BFP in the other participating reserves. The table presents some examples of items acquired under the different components.

In some cases the data presented is a mix of routine operational costs and investments related to initial project evaluation, consulting services and sites construction. Thus some big gaps between the target calculations and actual expenditures may be explained. One might expect that once all objects are constructed and projects enter their normal operational phase, the expenses will be reduced significantly. It is also worth noting that the figures of actual expenditures for the Association, Social and Income components include costs related to maintenance, labour and transportation of materials and people, and do not correspond only to the equivalent value of the facilities and equipment that is available for participants' use. We found it hard to separate these costs, as the reports do not offer insight into the actual details of what each disbursement line represents. Regardless, these additional costs are important for the completion of each component, and should be accounted for.

It must also be clarified that the number of registered families is smaller than the number of qualified families due to some participants lacking the necessary documents such as the birth certificate and personal identification number. As of November 2009 the actual number of beneficiary families reached 321, some of them have joined the programme in the middle of the year thus the difference in estimated amount and the actual amount spent on the Family component may be explained.

Table 1: Distribution of funds for Family, Association, Social and Income Components in Juma (April 2008- December 2009)

Component:	**Family**	**Association**	**Social**	**Income**
Method of Calculation	Direct payment: (Number of qualified families per conservation unit) x (monthly amount) x 12	Direct investment of 10% of total annual amount paid under the Family component per conservation unit	Direct investment of BRL 4,000 per community	Direct investment of BRL 350 per qualified family (BRL 4,000 on average per community)
Estimated Annual Expenditure for Juma	378 qualified families x BRL 50 x 12 = BRL 226,800	10% of BRL 226,800 = BRL 22,680	BRL 4,000 x 41 communities = BRL 164,000	BRL 350 x 378 = BRL 132,300
Actual Expenditure for Juma from April 2008 to December 2009	BRL 25,600 + BRL 168,900 = BRL 194,500	BRL 9,426 + BRL 41,334 = BRL 50,760	BRL 800,043.33 + BRL 1,341,825 = BRL 2,141,868.33	BRL 27,759 + BRL 73,475 = BRL 101,234
Results and projects in progress	*Individual monthly payments*	*Head office, office equipment and supplies, boat, fuel*	*Schools, supplies and equipment, health station, rain-water collection system, ambulance boats, fuel, radio communication bases, electrification*	*Brazil nut workshops, nut drying facilities, boat, fuel*
Available funds from April 2008 to December 2008	**From Marriott International:** • Received between April 7th and December 31st 2008: BRL 1,090,683.46 • Additional income from cash investment: BRL 10,533.78 Total available from Marriott: BRL 1,101,217.24 **Additional contributions from FAS:** BRL 1,109,474,38_____ Grand Total: BRL 2,210,691.62*			
Available funds for 2009	**From Marriott International:** • Rolled over from 2008: BRL 752,646.00 • Received in 2009: BRL 882,445.00 • Additional income from cash investment: BRL 14,145.00 Total available from Marriott: BRL 1,649,235.00 **Additional contributions from FAS:** BRL 551,837.00_____ Grand Total: BRL 2,201,073.00**			

Further explanations for distribution of resources under each programme component are as follows:

Family Component

As mentioned before, the Family component consists of individual monthly payment of BRL 50 to each qualified family. Designers of the programme chose to deliver money through Bradesco Bank debit card. The closest location where the money may be withdrawn is the branch of Bradesco Bank located in Nova Aripuanã. Such a payment format was chosen both due to security and cost considerations. It would be too costly and risky to travel around all 14 reserves, including Juma, and deliver the cash in person to each participant. In addition, the beneficiaries themselves may decide how often and when it is most convenient for them to withdraw the payment (pers. mess. Pinto 2009). Besides, the designers of the BFP hope that the use of bank cards will give more credibility to the programme (pers. mess. Netto 2009). As increasing poverty levels within Juma are of major concern, project designers hope to see the monthly payments spent on food and supplies for children.

It was decided to issue the bank card in the name of the female head of the family in order to strengthen women's role in the family and ensure more efficient money spending in terms of supporting immediate family needs. Even though women contribute significantly into production and are more aware of the household spending and demands, they often lack power to make important decisions within their households owing to the local gender culture. Programme designers made an effort to empower women, hoping to make them more involved in the life of their communities. One of the representatives of FAS noted that women now feel more valued and satisfied because of this official recognition. While women did not feel underappreciated before, as letting men decide over the money is considered a norm, they have responded by increased participation in community meetings and have shown a great interest in the programme (pers. mess. Netto 2009).

As some FAS personnel have reported, initially the decision to assign payments to women was met with certain dissatisfaction by the male population; however after all it did not present a major issue and the choice was soon generally accepted. Even though we did not have a specific question regarding this issue in our individual questionnaires for the programme participants, we never came across any negative comments from male interviewees during our general discussions.

Income Component

One of the components bringing collective benefits to the communities is the Income component. This component supports any sustainable production which can generate income under existing market conditions except for agriculture, since it may promote deforestation. The existing economic activities, unless contradicting the BFP agenda, are identified and reinforced taking into consideration environmental and human potential for each given area. Communities may propose their own ideas and, in case their personal expertise is not enough, receive technical and educational support from FAS. The money is not managed by the communities directly, but is channelled in the form of investment by FAS into equipment or relevant educational activities (pers. mess. Netto 2009; pers. mess. Pinto 2009).

FAS hopes that the collective action under this component can improve infrastructure and communication among individual members of the community, thus all equipment must be shared and the decisions regarding which activities the participants would like to be supported by FAS are discussed collectively (pers. mess. Pinto 2009).

FAS would like to see people keeping their options open and stepping away from agriculture as the only source of income. Agro-forestry and non-agricultural production based on the resources available in the area may become a viable source of income for the forest communities. The programme designers also hope that unlike the monthly payment, the opportunities provided by the Income component will become the main source of financial security for individual households by reinforcing local sustainable production (pers. mess. Pinto 2009). Currently the only project under the Income component is aimed at reinforcing activities related to Brazil nut collection and commercialization.

Association Component

This component is aimed at strengthening the local organization and participation. With the help of this component the Association of Dwellers of Juma has been created in 2009. FAS helped the communities set up an organisational structure, and donated resources to enable the functioning of this body, such as office equipment, generator, fuel and large boat which is used to gather people along the rivers for meetings in Novo Aripuanã and to transport various materials for communities within the reserve. Construction of a head office has also been sponsored by the programme. By the end of 2009 the association had 725 registered members.

The organisation is supposed to facilitate the decision-making process in relation to implementation of the programme components within the reserve as well as to disseminate information concerning the reserve management plan (FAS 2010a).

So far, only 40 of our interviewees were able to recognize the name of the component and mentioned that they are members of the reserve association. The respondents have also noted that each member of the Dwellers' Association is supposed to pay a monthly fee of BRL 2.50. However none of the respondents could clearly explain how this structure is managed, how the decisions are made, or how the money is allocated.

Social Component

The Bolsa Floresta Social component focuses on four aspects: education, health, transport and communication. Development in these spheres is largely the responsibility of the state; for this reason FAS implement this component in partnership with various state organisations. The reason is that FAS are already present in these remote forest areas and it is logical that the infrastructure they have established is used to provide social services to the forest dwellers (pers. mess. Pinto 2009).

Some of the results are as follows: since the beginning of 2009, three communities strategically located on different waterways within the reserve have been equipped with fast boats primarily meant for transportation to the nearest hospital in medical emergency situations (FAS 2010a). Another fast boat is frequently used both for transporting FAS personnel, school teachers and reserve residents between the communities and the town of Novo Aripuanã.

A radio communication base has been established in the community of Boa Frente; three more bases are currently being installed in other communities within the reserve and are expected to start running in 2010 (FAS 2010a) (MP). An electrification project has been started at the end of 2009. A workshop on proper use and maintenance of electrical network was held in the community of Boa Frente. The equipment had not yet been installed at the time of our presence in the reserve. The annual disbursement for this project was BRL 287,275 (roughly USD 143,638).

A health station has also been built in Boa Frente. The equipment was paid for by FAS but it is staffed by the state and the whole health station project is run in cooperation with the

National Health Foundation (Fundação Nacional de Saúde, FUNASA) and the Foundation for Health Surveillance (Fundação de Vigilância em Saúde, FVS) (FAS 2010a; pers. mess. Pinto 2009). However the station's functions are limited to providing simple treatment and vaccinations. It does not remain open on a daily basis and people seeking urgent medical attention need to go to Novo Aripuanã.

A school (J.W. Marriott Jr.), dormitories for the students and a teachers' house have been built and running in the community of Boa Frente, all equipped with solar panels. Two more schools and the adjacent facilities are currently under construction in the communities of São Miguel/Boca do Juma on river Aripuanã, and in Abelha on the River Mariepauá (FAS 2010a; pers. mess. Pinto 2009). Another project currently under construction is the rain-water collection system in the community of Boa Frente and São Miguel/Boca do Juma on the river Aripuanã. The water tanks have already been supplied and installed by FAS for the school facilities in Boa Frente. However, this project implementation for the residential houses of the community is delayed, as the roofs need to be changed on most houses in order to be strong enough to hold the weight of the collectors. The installation in the other community has also not yet been finished.

5.3.2.2 Who is the main decision-maker and responsibility-bearer in designing the programme and distributing the resources; the donor (Marriott) or the intermediary (FAS)?

The structure of the BFP had been decided long before Marriott has expressed the interest in sponsoring the programme in Juma, thus they have agreed to buy a ready-made product and do not interfere with the project implementation. FAS are the main decision-makers in relation to funds allocation among different projects supervised by the foundation. The initial concept of FAS has been approved by its main donors and their further involvement has been for the most part limited by the financial participation. FAS is run by the board of directors: Virgilio Viana (General Director), João Tezza Netto (Scientific and Technical Director) and Luiz Cruz Villares (Finance and Administration Director), but also has an advisory board, which consists of representatives of various international and state agencies and scientific organisations. The board meets every three months to discuss the annual plan. Sponsors have

a right to send their adviser or appoint an external one to be a member of the advisory board. So far only Bradesco Bank has chosen to do so (FAS 2010b; pers. mess. Netto 2009).

When it comes to specific activities under the Association, Income and Social components, FAS representatives in partnership with the responsible state bodies are the main decision-makers. The state of Amazonas is responsibility-bearer in providing health services and education within the reserve, however in case of investment projects under the Income component, the communities themselves become responsible for maintaining the equipment (pers. mess. Pinto 2009).

5.3.2.3 What was the role of the local communities in the Juma reserve in designing the distribution of the resources?

When new investment options are considered, the communities are usually consulted by FAS technicians regarding the potential costs and benefits of a given project. All opinions are presented and the participants themselves may decide on the type of project they would like to see in their community. FAS does not force anyone to engage in any activities under the Income component and only offers some options that may function well within the given community, while the final decision is to be made by the community residents. On the other hand not all proposals from the community members can get the approval from FAS. Projects which are contradictory to the BFP agenda and to the reserve management plan will not be supported. Thus the range of alternatives is not infinite and participants usually need to choose from a few available options (pers. mess. Netto 2009; pers. mess. Pinto 2009).

In regards to the other components, distribution of resources is also largely decided by FAS, such as the location of schools, which communities get the fast boats and communication bases, or the availability of courses, as this is based on strategic considerations and logistics. The communities in question are consulted prior to implementation, yet we do not know if the communities can refuse these measures, or if anyone has ever opposed them. The residents were not included in the decision-making regarding the payment; this is explained in the next sub-chapter.

One may conclude that the participant's decision-making rights are somewhat limited, however this is stipulated by the fact that FAS has more expertise in certain areas, while local

residents may be completely unaware of some options which could bring desired progress to their habitat. In addition, FAS has a certain agenda of improving health, education and diversifying means of sustainable income generation for Juma residents, thus budget priority is given to the projects of superior importance according to such agenda.

5.3.2.4 Were the methods of payment calculation based on opportunity costs?

The payment amount was calculated based on the availability of funds at the moment of the programme creation and on the future budget expectations, as well as on the number of potential beneficiaries (pers. mess. Netto 2009; pers. mess. Pinto 2009; pers. mess. Viana 2009). Local communities have not been consulted prior to defining the payment amount as it was demanding, both physically and financially, to visit all locations within the participating conservation units (pers. mess. Netto 2009). In any case it seems that the expectations from the potential beneficiaries would not be taken into consideration as the payment amount does not intended to substitute main income and was not designed to compensate any possible loss due to a shift from former income generating practices to those complying with the programme regulations (pers. mess. Pinto 2009).

FAS representatives explicitly stated to us that the payment will not be increased and that it is offered as a form of recognition to the people residing in the reserve and as a tool to attract participation in the programme and create trustworthy connection between FAS and the communities (pers. mess. Pinto 2009; pers. mess. Viggiani 2009). Nonetheless many participants are misinterpreting the situation and expecting the payment to increase.

5.3.3 Are the rules of the BFP followed?

5.3.3.1 What control mechanisms do FAS have?

The foundation itself does not have a legal punitive function. When reserve regulations pertaining to deforestation, fishing, hunting, etc. are violated, FAS can only inform the responsible authorities so that they can act upon such cases (pers. mess. Pinto 2009). FAS are sponsoring the construction of the reserve monitoring base on the 80th km of the federal

highway AM-174 and will act as a supporter to the state authorities (FAS 2010a). Since most rules of the programme are closely interconnected with the reserve regulations, the monitoring of the compliance of the community dwellers to the rules of the BFP is in part carried out by the organisation involved in the management of the conservation unit.

The formation of the Deliberative Council of the Juma reserve has been initiated in 2008. This council involves both internal and external actors, including representatives from various public and state organisations, the Association of Dwellers of the reserve and representatives from other civil organisations, with 30 members in total (see Appendix III). The degree of punishment for various violations is to be decided in a participatory manner by the members of the Council (FAS 2010a). However the functioning of the Council has not yet been well established and we do not know the degree of involvement that these actors pose in relation to the management of the Juma reserve or where their interests and responsibilities lie.

Since the reserve management plan is new and the zoning regulations have been established only in the beginning of 2010, it has been agreed that a probationary period of two years shall be established. This means that non-compliance by the reserve dwellers will be subject to so-called "educational control measures" and no legal sanctions will be applied. Once the rules become familiar to everyone, formal measures will come in place (FAS 2010a).

FAS have a direct control of the violations associated with agricultural activities of the forest dwellers participating in the programme. In cases of unauthorised use of primary forest for plantations, or when the size of active cultivation land exceeds the limit of two quadras/ year, or the fire use is applied to the cultivation areas more than once a year, sanctions may be applied. First the violators are warned and explained the rules once again, and are expelled from the programme in case of repeated violations. FAS cannot deny the violators' right to benefit from social services provided by the BFP, such as education and healthcare; however the individual payment will be revoked (pers. mess. Pinto 2009). To our knowledge, this has only occurred once.

In addition, the foundation field technicians regularly visit the communities and double-check that those families who have relocated to town do not remain listed as beneficiaries of the programme. The community presidents are usually aware of the current situation and may advice on cases of migration. Participants will continue receiving the programme benefits as

long as their main home and production remain within the reserve, even though some family members may choose to live or attend school in town.

The participation in all the components of the programme is voluntary; yet discontinued membership at the BFP does not imply that activities contradictory to the reserve regulations will be allowed. Non-members will still be monitored and reported to the authorities by FAS. As one of the FAS representatives put it, the programme encourages certain behaviour, but Brazilian law requires it in any case (pers. mess. Pinto 2009). The issue of voluntary participation will be further addressed in section 5.4.5.2 and in the discussion chapter 6.2.

5.3.3.2 What role do local communities play in the monitoring and control of the BFP rules?

We looked at how informed and supportive the people are in relation to ensuring that the programme regulations are followed and in relation to cooperating with FAS and state authorities. The information regarding new conditions, in particular those concerning deforestation, seem to be spreading among programme participants. Ninety-six respondents were asked about the rules of the BFP and about 56% (55 respondents) were able to name at least some of them. The regulation against clearing of the primary forest both for agricultural expansion as well as for timber sale was the most known among the respondents – it counted for 81% (45 answers out of 55 who were able to name the rules) of all answers.

Even though FAS personnel noted that cases of reporting the violations are not rare, our findings can only demonstrate the potential actions of forest dwellers in response to observing violations. We asked the respondents to tell us what they would do when seeing someone logging illegally. Six percent of the respondents said they would do nothing, while 47% said they would try to talk to the violators and ask them to stop. Forty-five respondents (also 47%) said they would inform the authorities regarding the observed violation. Those respondents who said they would do nothing explained their choice by the fact that they are afraid of trying to oppose illegal loggers and also by the disbelief that their actions could change anything. Those people who expressed their willingness to act explained their choice by the influence of the environmental knowledge that the programme has provided and by the desire

to protect the resource for future generations as well as by the need to reinforce the law. Two respondents said they think it is unfair that they had to discontinue logging while others would continue to do so and break the rules, thus they would try to stop the violators. It is notable that none of the respondents have explicitly named the individual payment as the driving force behind their choice.

However these answers are just a projection of potential behaviour as only 16 respondents from the sample stated that cases of observing illegal behaviour have happened and only one person confirmed taking action in the situation by reporting to FAS. Our findings are thus insufficient to evaluate the real degree of local involvement in the process of monitoring and control of the programme rules. However regardless of this, the capacity the local forest dwellers possess may not be enough to resist the illegal invaders explicitly and their role may be limited to a solely informative function. It seems that even if forest dwellers themselves would not necessarily be involved in systematic voluntary reporting, they still willingly share their observations with the respective authorities and FAS personnel when asked directly during the field visits.

5.4 Impact of the BFP on Livelihoods, Behaviour and Attitudes

This section covers the impact of the BFP on the livelihoods of the residents of the Juma reserve, and eventual changes in their behaviour and attitudes towards the environment and the forest resources that the programme might cause. The structure follows the research questions from chapter 1.6. The analysis in this section is based on reviewing individual interviews with FAS personnel and the residents of the reserve as well as our personal observations. For rates on deforestation we have also obtained an image from FAS showing recent trends in the Juma reserve, as well as data from the Brazilian Ministry of Science and Technology.

5.4.1 Has the implementation of the BFP had any impact on behaviour in relation to agricultural practices and forest product harvesting?

Aiming to asses changes of local residents of Juma in relation to their agricultural practices we asked if they were cultivating their lands differently now compared to before the implementation of the BFP. Seventy-four percent (71 answers) of the respondents said that they were not working differently or using new methods in their cultivation practices (see Figure 7). Most of local people are still working with the same farming tools, agricultural methods, and growing the same quantity and kind of crops that they used to do before the BFP was implemented. According to the information provided by one of the FAS coordinators who contributes to the school in Boa Frente, the way local people have been practicing agriculture, including by using slash-and-burn, is not so negative for the environment, as they did not use pesticides, their agriculture is mainly subsistence-based, and most only logged to build their houses. We could assume that since the inhabitants of Juma are the ones who depend more on the forest resources, they treat local resources in a sustainable way, even without being familiar with this relatively new socially constructed term.

The survey reveals that the inhabitants of Juma do not have agricultural practices that contradict the BFP rules or the rules of the Juma reserve. While the BFP is trying to change slash-and-burn practices to more environmental techniques, fire use is not always prejudicial. Some seeds, for example, can germinate only with fire use (pers. mess. Schwade 2009).

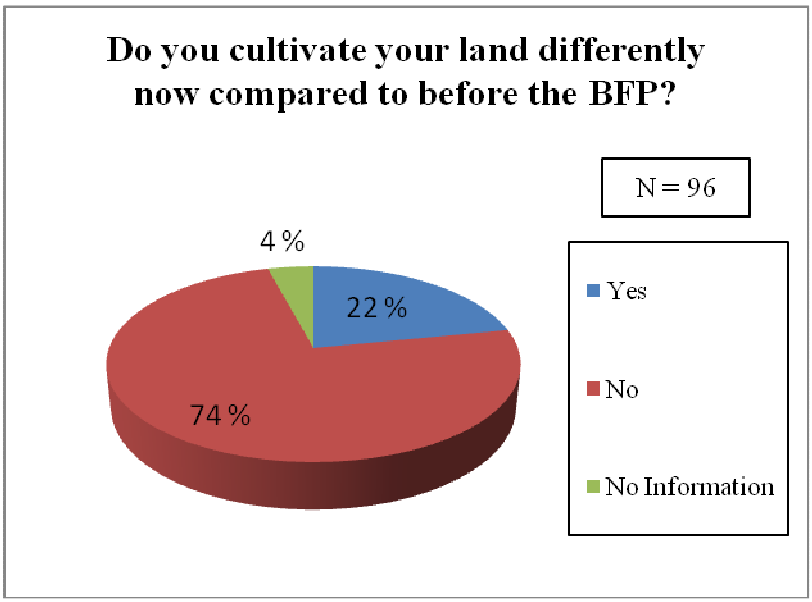

Figure 7: Changes in cultivation methods after the implementation of the BFP

(Question 9 - Do you cultivate your land differently now compared to before the BFP?)

Out of 96 respondents, 28% (27 answers) reported changes in agricultural practices, while three people could not answer the question. To assess what these changes are, we asked these 27 respondents what changes they have made in their agricultural practices. Twenty-two percent (six answers) of the households interviewed said that they have stopped deforesting, and the same amount reported decreased cultivation size. Twenty-two percent (six answers) of the respondents that reported changes in agriculture practices said that now they are working less due to illness, age or because they got injured. Fifteen percent (four answers) have ceased using slash-and-burn, while 11% (three answers) are using their cultivation areas in a more productive way. One person reported working less due to the BFP implementation, although he did not specify how so. One person reported changing agricultural practices, but could not specify what these changes were (see Figure 8). In relation to the size of the cultivation area, no one had a cultivated area bigger than two quadras, which is the upper limit set by the reserve and BFP rules. The small number of people changing their behaviour in agriculture practices can be explained by the fact that the components that are designed to improve agricultural practices have not yet been fully implemented.

In regards to forest products, local people mainly collect three goods: Brazil nuts, copaiba oil and açaí. We could not observe any differentiation in the collected amount of these forest products after the implementation of the BFP. The households did not report the collection of any illegal products; however we cannot be completely certain about this as people could be afraid to report. During the interviews, many respondents reported that they hunt, yet it did not rank highly among the importance of the forest. When asked, most people confirmed that they rarely hunt and only ever to feed their family. Among the species often hunted in the area there are some that are protected, as we saw one household with a jaguar skin hanging out to dry, and in addition we observed people shooting at parrots and monkeys. This is also related to that these species compete for fruit and other products with the residents. Although some interviewees reported that they used to hunt for commercial sale, we could not confirm which species they hunted. Most likely it was forest pigs and other birds and mammals, such as *cuniculus paca,* which is a forest rodent. To sum up we could say that the BFP has not yet had a significant impact on agricultural practices and forest product harvesting among the dwellers in Juma.

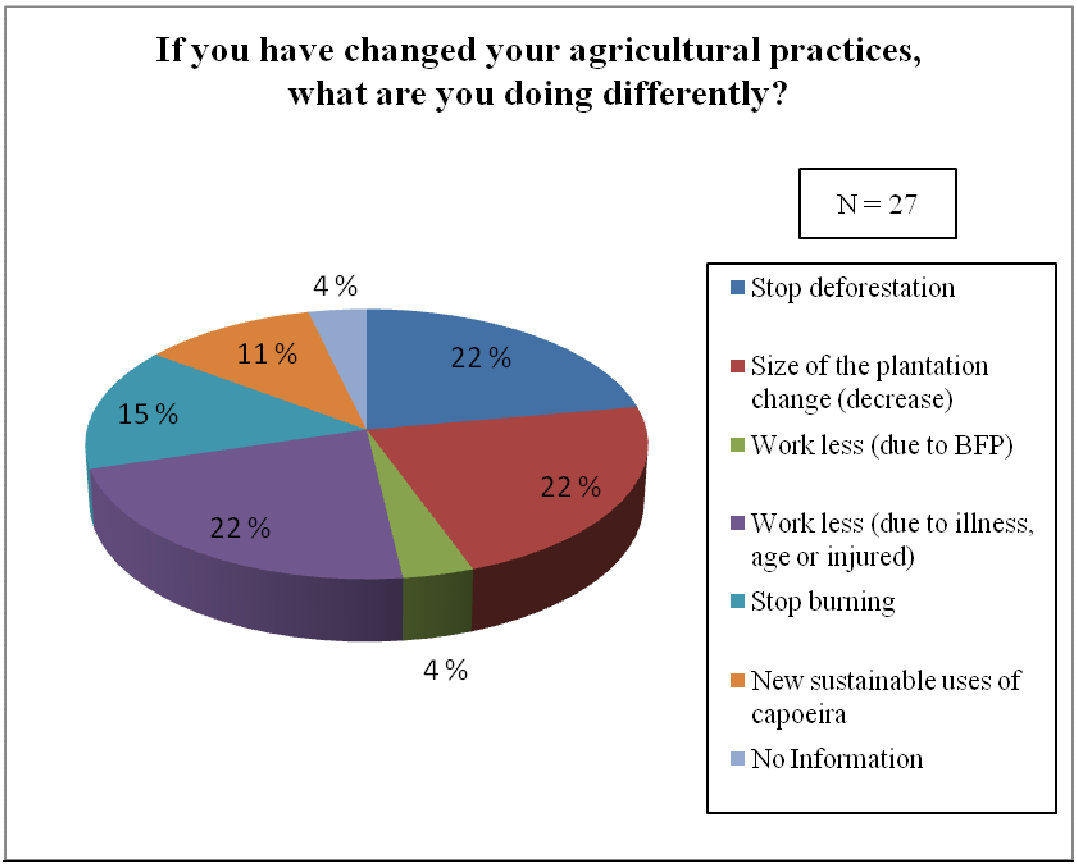

Figure 8: Changes in agricultural practices after the implementation of the BFP

(Question 9.1 - If you have changed your agriculture practices, what are you doing differently?)

The BFP seems to be having some effect on the residents. When asked if they thought the BFP is helping to protect the forest, 89% of interviewed households agreed (see Figure 9). When we asked in which ways the programme was helping, we obtained an extensive list of explanations. Many of them expressed that the payment in combination with the environmental information they are receiving from the BFP does in fact help. On the other hand, other respondents said that the establishment of the reserve was the main reason behind increased forest protection. In regard to the payments' role in helping families, respondents said that it is helping just a bit because the payment was very low, and cannot replace previous activities, however most of the residents of Juma have not made any changes.

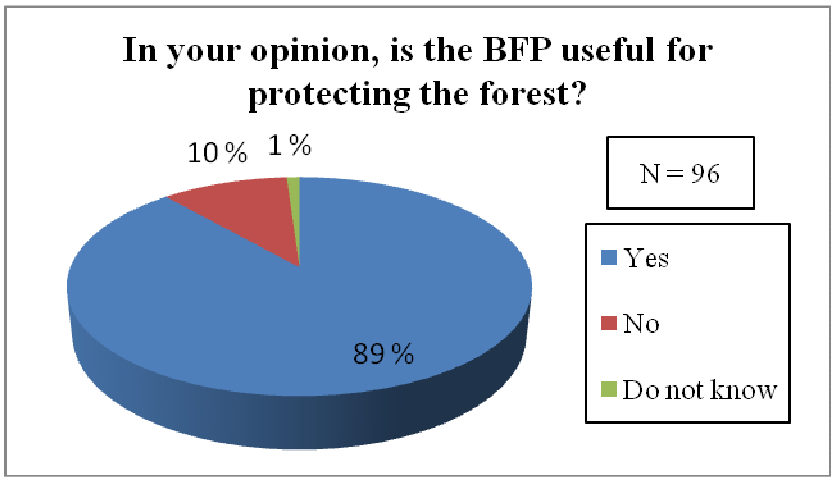

Figure 9: Do the residents believe the BFP helps to protect the forest?

(Question 43: In your opinion, is the BFP useful for protecting the forest?)

5.4.1.1 Is the deforestation rate decreasing?

In an attempt to examine real changes in deforestation, we thought questions related to deals with illegal loggers and the use of fire in cultivation could tell us something about previous and current trends of deforestation on behalf of the Juma residents. We also wished to establish if there are any new uses of the forest and its products, as this is emphasised as an important method to reduce dependency on logging activities for income. Based on these ideas, we have formulated three sub-questions that will be answered here:

i. Are deals with illegal loggers still common?

ii. Is the fire use controlled?

iii. What are the new uses of the forest?

Satellite data from Project PRODES (Satellite monitoring of the Brazilian Amazon forest) based on data gathered by the National Institute for Space Research (INPE – O Instituto Nacional de Pesquisas Espaciais), which provides satellite monitoring support to various institutes and organisations in Brazil, shows the changes in deforestation patterns throughout the entire Brazilian Amazon. From this source we have obtained data on deforestation for the Juma reserve. As mentioned before, Juma is an area of low deforestation, but facing increased

pressure in the future. Based on the calculations made by INPE, by 1997 only 48.1 km^2 of forest had disappeared in Juma, equal to about 1% of the total reserve area. From 1997 to 2008, there has been a very slight increase in deforestation, never surpassing a 1% increase from the year before, and by the end of 2008, the deforested areas in Juma only totalled 68.7 km^2, the equivalent of 1.2% of the reserve area. The reserve's total area is estimated to be roughly 5843 km^2, with 95% of this being vegetated area in 2008, 3% in hydrographic, 1% is un-vegetated areas (such as communities, roads, etc), and the remaining percent is unaccounted for (Ministry of Science and Technology 2010).

Data from the years 2006 to 2008 show no increase in percentage of deforestation, although the figures show that actual deforestation went from 0.6km^2 in 2006, to 0.4km^2 in 2007, back up to 0.7km^2 in 2008. This drop from 2006 to 2007 could be attributed to the creation of the reserve, but the increase from 2007 to 2008 in more difficult to assess. The introduction of the BFP does not seem to have had any effect, although the increase could be explained by small scale clearing for cultivation or infrastructure improvements along the AM-174 highway that crosses the reserve (Ministry of Science and Technology 2010). We could assume that the creation of the reserve would have a more direct effect on deforestation, and the Juma reserve was established in 2006. Yet we cannot assure that the drop in deforestation from 2006 to 2007 can be attributed to this fact.

We have been able to obtain an image from FAS which shows deforestation for 2007 in Juma and the surrounding area (see Figure 10), with most deforestation located near the towns and communities along the rivers in the area. This map can be compared to the map from Figure 2 (see chapter 5.1) revealing the high prognosis of deforestation by 2050 in Juma.

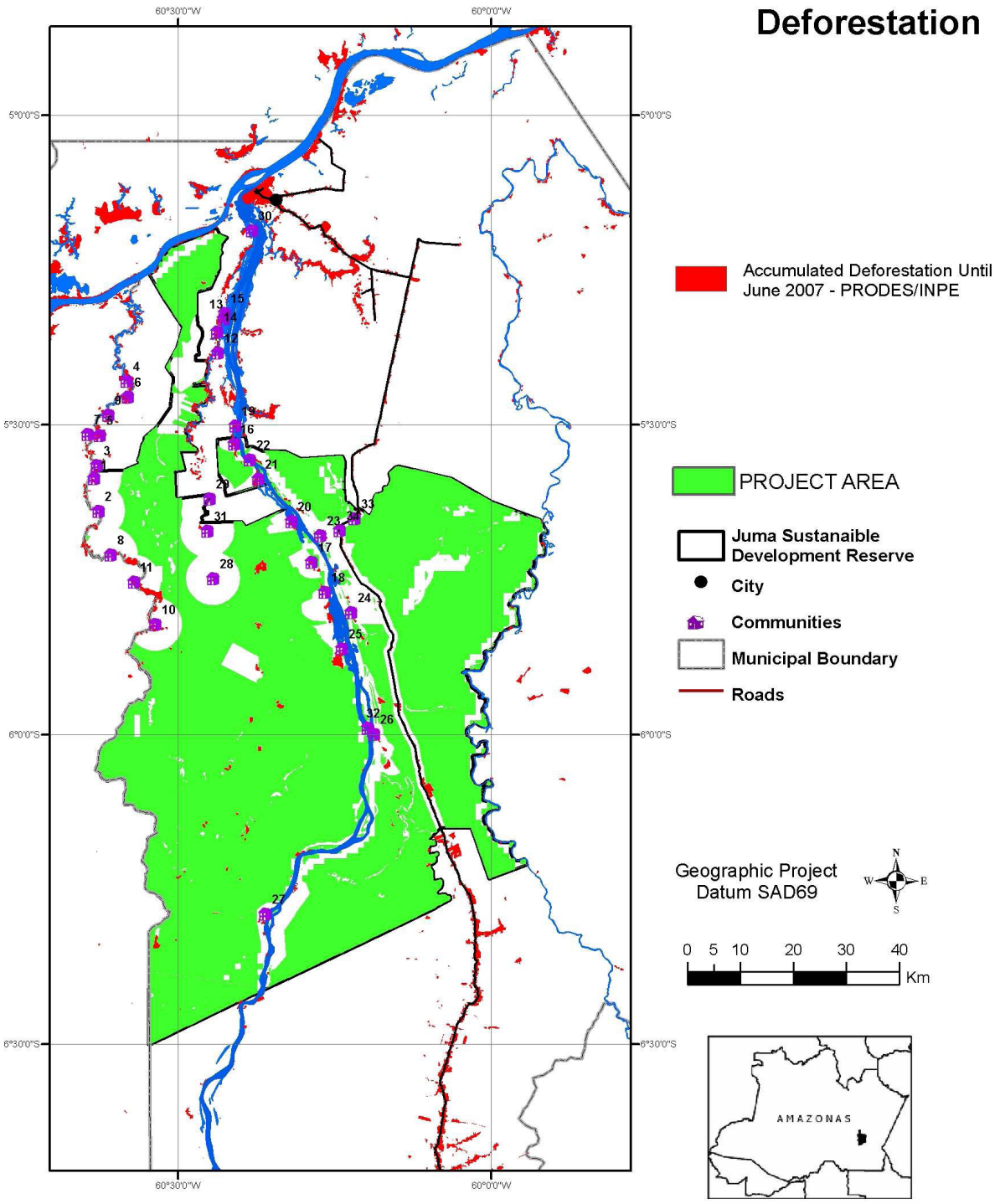

Figure 10: Map revealing deforestation areas in Juma and surrounding areas. Red marks deforestation, mainly located along the highway AM-174, the rivers, and near the towns and communities in the area. Source: (FAS 2008a).

During our fieldwork it became apparent that most households only use what they need to survive. Deforestation is mostly due to the need to improve or build new houses, and in some few instances to clear land for new cultivation areas. Interviews with FAS confirm this, stating that many realise the value of the forest for its products and the protection it provides for the residents. Only a few reported to have participated in commercial logging – just 12 respondents confirmed having done so, however we only managed to ask 28 interviewees since the question became of interest quite late during our fieldwork (see Figure 11). Out of these twelve, seven cited the creation of the reserve as the reason for stopping, i.e. they felt they had to obey the new rules. Only one person named new knowledge about the environment as a reason to stop logging, while one family admitted to still selling timber as they were a large household and needed the money to survive. This authenticates FAS' claims that deforestation by the communities is driven by social and economic needs. Feeding their families will have a priority over environmental concerns, and until a thorough alternative is provided, this will be difficult to change. Nonetheless, it may still be too soon to observe any real changes in deforestation trends since the creation of the reserve, which has a much stronger and immediate effect than the BFP, which will take time to change behaviour and attitudes.

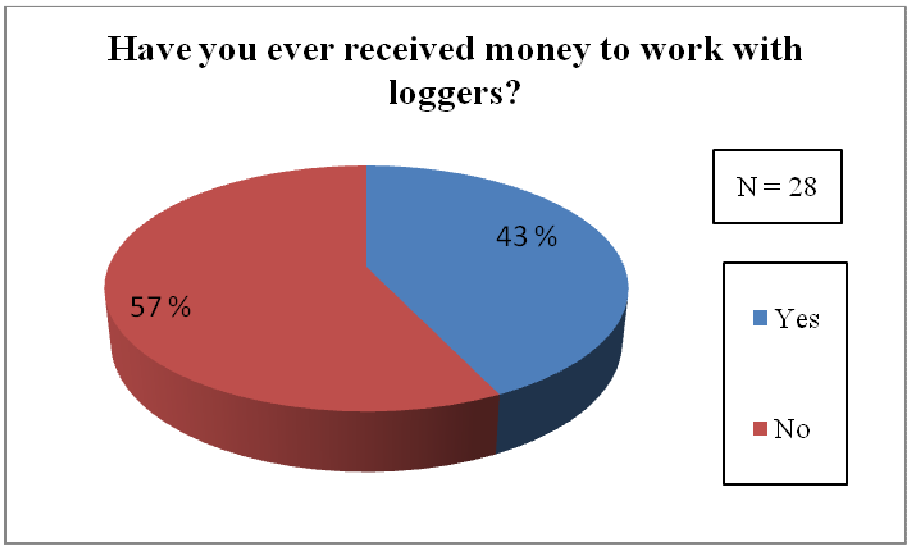

Figure 11: Employment with illegal loggers

(Question 39– Have you ever received money to work with loggers?)

Concerning fire use, most households still practise slash-and-burn. The rules of the RDS reserves state that slash-and-burn must be limited to once a year, which is supported by the

BFP rules (FAS 2010a). When asked if cultivation methods have changed, only four residents mentioned that their methods had changed due to less fire use. Interviews with FAS personnel disclosed that they will attempt to phase out fire use, but that it will require more education and new tools. In some cases fire use can also be beneficial, and small scale practices will have little effect on carbon emissions. The working conditions can also make fire use appealing, as it requires less effort than other clearing methods (pers. mess. Schwade 2009).

One of the four components of the BFP, the Income component, clearly addresses the need to create new sustainable uses of the forest and its resources, in order to provide a viable alternative to logging and other prohibited activities. As this component is still in the implementation phase, only a few courses have been held. The initiative for new sustainable uses of the forest also includes new knowledge about resources via educational efforts from FAS. At the J.W. Marriott Jr. School in Boa Frente, which covers 5th to 8th grade, new ways of cultivating and harvesting products are being taught to improve the students' ability to better take advantage of the resources available to them, while at the same time conserving their livelihood base and expanding their possibilities (pers. mess. Schwade 2009).

5.4.1.2 Has the BFP changed behaviour in relation to the residents' role in protecting the forest?

As the idea behind the BFP is to promote environmentally friendly behaviour, it is interesting to identify if the communities in question felt responsible for protecting the forest beforehand. We would like to evaluate if the BFP has changed behaviour on the ground, by making the residents more aware of their relation to their resources, and if they now feel more able to protect their resources. It is also of interest to learn if the residents are committed to the task, and report illegal activities. Based on this, we have formulated the following sub-questions:

i. Is it perceived as a new task or was this role already internalised in the communities?
ii. Do they feel more empowered versus more obliged to monitor their resources?
iii. Are the communities and individuals sincerely engaged in protecting and monitoring their resources, or are they trying to benefit from both options (the payments and illegal deals)?

The idea that the forest dwellers are guardians of the forest is explicit in FAS discourse (FAS 2010b)(FAS website). The BFP is based on recognising the work that forest dwellers provide in terms of their presence and participation towards the reserve and protecting their resources. One FAS worker commented that without the input of the Juma residents and their commitment, deforestation in the reserve would have been much higher than it is (pers. mess. Pinto 2009).

When talking to the residents, our general opinion was that people value the forest as their home and their livelihood, and they were anxious to protect the reserve from outsiders. They confirmed that they would report anybody breaking the rules of the BFP, regardless of who it was, and that they appreciated the possibility and legal protection rights they now had. Six respondents reported that it was their duty and responsibility as the forest keepers to protect the reserve, which totals 7%. However, only six out of a total of 89 respondents who confirmed they would take action gave this answer, showing that following the rules weighed more heavily on their mind than their roles as forest keepers (42 answers out of a total of 89 answers from the respondents). Other reasons given were the importance of conserving the forest and the environment, and the new knowledge they had gained on these issues. Some also mentioned that they believed the authorities will take the appropriate action, while only one person mentioned the BFP directly. Yet it may also be an issue that the forest dwellers simply do not see themselves as protectors, as they formerly did not have the rights to back this up, nor was it custom to do so due to strong political and economic conflict that such action entailed.

On the other hand, two people mentioned they would not take action for fear of reprisals and death threats from the people responsible for logging, as this unfortunately can be common in Brazil. One could then say that the residents are sincerely engaged in protecting and monitoring their resources, but mostly only against other local inhabitants. The issue of outsiders is more uncertain, which is the bigger threat to forest conservation in the area.

From our interviews with the residents it seems that few people have previously logged on a large scale for commercial profit (see Figure 11 above), and most people were relieved that the legal status of the reserve now gave them the protection they desired from outsiders. This legal status, along with more information on the actions they can take against those who violate the rules, seems to make the residents of Juma more aware and determined to stop such behaviour. It has become clearer who they can report to – the community president, FAS

workers, or they can directly contact IBAMA's office in Novo Aripuanã. The prolonged presence of FAS and the BFP should only increase this ability to report illegal behaviour, and give residents more responsibility. As mentioned above, many respondents clearly state that the reserve and the legal protection it guarantees gives them a sense of empowerment to protect their communities and the forest. Nevertheless, it must also be mentioned that in one community we found several individuals who have seen large boats loaded with timber passing in the night since the reserve was created.

The possibility to take advantage of the BFP payments and at the same time benefit from sale of timber is a possibility, but no respondents divulged that they practiced this. Breaking the rules of the BFP can result in warnings and, after a certain period of time, in expulsion from the programme. Yet only once has it occurred that somebody deforested openly, and after receiving a warning, the individual ceased the activity. In addition, deforestation and other rules of the BFP are also listed as reserve rules, meaning violators of these risk formal punishment in the form of fines and jail sentences. This alone should deter people from breaking the rules. We also questioned the residents about reporting any eventual violations of the BFP and reserve rules, and 94% (90 of a total of 97 given answers) of respondents said they would take action against the violator, either by talking to the person directly or by informing the authorities or the community president (see Figure 12). Only six people reported they would take no action.

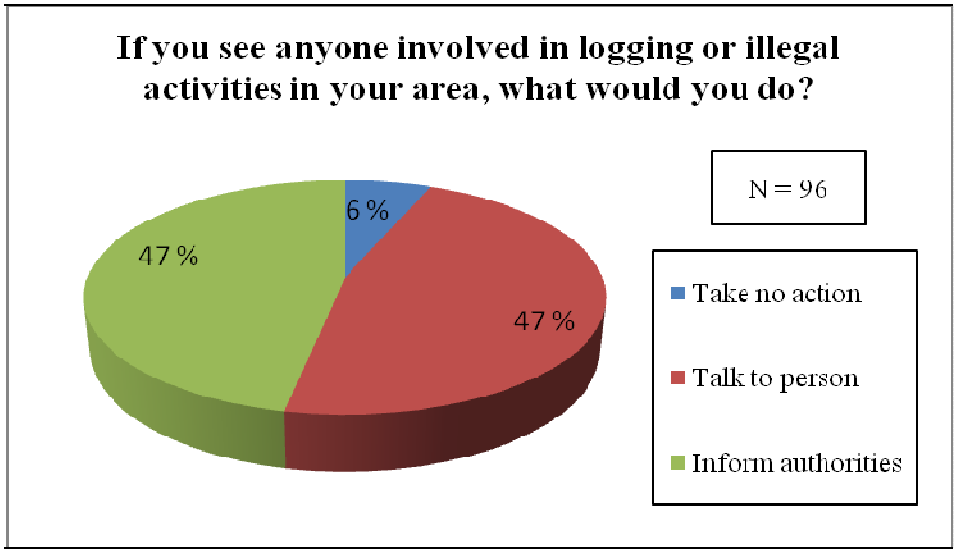

Figure 12: Action taken when illegal activities are observed

(Question 38 from survey - If you see anyone involved in logging or illegal activities in your area, what would you do?)

When further asked if the residents feel pressured to follow the rules, 34% confirmed this, reporting that they looked out for each other and made sure everybody participates (see Figure 13). Some mentioned that this is their responsibility, which could suggest they see themselves as "guardians of the forest", while others stated that if they have to obey the rules, why shouldn't everybody, thus reinforcing behaviour. It can then be discussed if residents willingly punish others that do not cooperate, even though this does not entail a personal loss for them. Contrarily, not punishing non-cooperation does entail a loss for them, by losing forest resources and seeing others gain income.

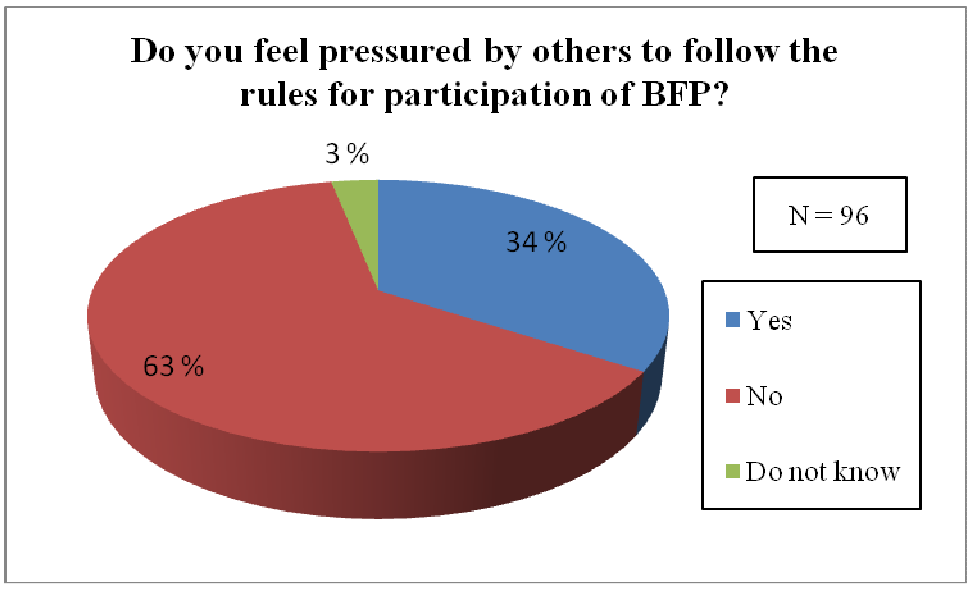

Figure 13: Do the residents feel pressured to follow the BFP rules?

(Question 41 - Do you feel pressured by others to follow the rules for participation of the BFP?)

It may seem that the residents have the willingness to report illegal behaviour and monitor each other, which reinforces the rules of the BFP and the reserve. But only if further action is taken will this have an effect on deforestation – if FAS or the Brazilian authorities do nothing when notified, they may risk that the local communities lose interest in participating and monitoring their resources.

5.4.1.3 Have the rules had any effect on income?

As we attempt to determine the effect of the programme on livelihoods, it is interesting to see the effect that the BFP rules have on income. There are two important issues that will be discussed in relation to this. First, the actual rules and their possible effect on income will be discussed, and the dimension of discerning between the BFP rules and the reserve rules. Secondly, we look at what the costs of the rules are, and whether they represent a loss of income and new costs for the residents, in relation to the opportunity costs they have lost due to the rules. Based on this we have formulated two sub-questions:

i. Has the payment changed the need to work?
ii. Is there any loss of income following from the rules?

The question of the value of labour is relevant if payments were able to affect income in such a way that labour inputs changed. It is interesting if payments are large enough to enable workers to produce less and maintain the same lifestyle as before, or enabling them to hire labour to produce more and thus increase income. However, in the case of Juma, the payment is low in comparison to monthly production and cash income. The payment of BRL 50 is often barely enough to cover travel expenses to town, where the residents can sell their goods and withdraw the payment.

In addition, from our observations, agricultural production and forest extractivism activities are time consuming and laborious, and due to the climatic conditions, one must work while one can. The possibility to hire labour from outside also seems difficult, due to the long distances one must travel to find people. Nonetheless, it is most probable that families help each other in times of harvest, and contribute to each others' production, as family ties are important. Hence, it seems that the payment does not yet have an effect on the value of labour.

Since the BFP is recently implemented, it is difficult to determine the real effect on income. There are several issues that must be mentioned in relation to this. Firstly, the rules of the BFP and the reserve are almost identical, at least pertaining to agricultural production, forest resource use, and environmental protection. Thus, any effect on income will be difficult to

attribute to solely either the programme or the reserve. Secondly, there are other factors affecting income that we were unable to measure due to the short amount of time we spent in the reserve. During our fieldwork, we noticed a large increase in monthly income that had recently appeared, due to a rise in prices for farinha, the manioc flour, as mentioned in the chapter on household income, 5.2.3[33]. We do unfortunately not know how long this price increase will last; most likely prices will fall again when production levels return to previous rates. This dramatic income gain made the effect of the BFP rules all the harder to estimate, as the Family component payment became irrelevant in comparison to these gains. Thirdly, income was difficult to estimate due to the fact that residents mostly produce what they need, and sell whatever is left, at least in terms of agricultural production. As for forest products, many gathered large amount to sell, yet nobody seemed to keep a detailed overview of quantities and prices. All we could obtain were rough estimates, based on information from the households, and estimates that FAS personnel also considered to be within average production rates.

In relation to loss of income, it is interesting to see how many residents actually had to change their practices in order to comply with the rules; both for the BFP and the reserve (see Figure 9 in 5.4.1). As many did not log commercially, and few had large cultivation areas, it follows that few people had to change their practices, and 69% did indeed confirm that they had not made any changes in agricultural practices. When asked if they had participated in commercial logging, only eleven out of 96 respondents replied they had done this, and out of these only one expressed that he would continue if he could. Among the others, it was mentioned that they disliked losing income – one man reported earning BRL 5900 in one job for loading two boats with timber – yet many seemed to support the creation of the reserve as long as they were compensated for their loss. It was also mentioned, not just among these respondents, but in general, that residents are concerned that restriction on their cultivation areas will eventually result in a loss of fertile land for them to produce on.

Going back to changes that the residents had to make, we asked which changes had to be made in relation to agricultural production (see section 5.4.1 for further detail). Among these changes, reduced deforestation, size of cultivated area decrease, reduced slash-and-burn, and new cultivation methods were the most common changes. In addition, we asked all the

[33] The price for farinha for the previous year (2008) was between 25-35 BRL/sack (which holds about 50L). During our fieldwork, residents informed us that they sold their sacks of farinha from 90 to 120 BRL/sack, with the upper price being most common.

residents if the efforts they had to make in general were worth the payments they received. Thirty-two replied yes (33%), while only 17% replied no. Another 8% (seven respondents) did not know, while 33% reported they did not have to make any changes. In addition, nine did not answer (9%). These results could seem inconsistent when only 27 reported they had made changes in agricultural practices, however the efforts made in order to receive the payments may refer to other actions, like participating in meetings, acquiring documentation needed to receive the payment, etc.

It seems that so far the BFP and the reserve rules have not greatly altered the behaviour and livelihoods of the majority of the Juma residents, as most of them usually practiced small-scale agriculture, and only used trees for construction – which is still allowed under the rules. It was not possible to calculate any new costs from eventual changes, such as changed production methods, as we lacked detailed information on these changes. Hence there does not seem to be a loss of income for most people, or any new costs. The few that represent a large loss in income, gained this income from illegal activity, yet the new rules are beneficial to the community as a whole.

The issue of forest product extractivism is also affected by the BFP and reserve rules. During the creation of the reserve and the implementation of the BFP, a thorough socio-economic and environmental mapping of the area was conducted, revealing that the presence of some forest products have declined in certain areas, most likely due to over-harvesting. This led to the creation of zoning being incorporated in the BFP and reserve rules, which delineates where residents can harvest certain products, in an attempt to protect the resources and prevent them from vanishing entirely. When the Juma residents join the BFP, they must also commit to following these rules. So, the rules do not prohibit these activities, but command that they occur in specific zones, possibly entailing new costs for residents if they have to travel further to attain the same amount of products as previously gathered. It is also worth mentioning that in relation to collection of forest products, two families reported travelling beyond the borders of the reserve, as they have land or family there.

In terms of the opportunity costs and the loss of income or new costs for the residents, it thus seems that there are few losses so far from the rules. Since the life of the residents in Juma has little effect on deforestation, there is little conflict between the rules and behaviour. Although there are few changes so far, this does not mean they will not occur in the future, as the BFP becomes more present in the reserve, and as the other three components with their respective

activities and plans are implemented. The BFP does plan to include new livelihood strategies, new cultivation methods, phase out slash-and-burn practices, etc., so new costs are likely to arise. However, it is assumed that these costs will be more than covered by new income opportunities and an improved life quality.

5.4.2 Has the introduction of the BFP affected attitudes towards the forest?

In relation to assessing if behaviour has changed, it is also important to address if attitudes have been altered correspondingly after the implementation of the BFP. In order to do so, we will examine if the residents see the forest in a new way, and if the payments have any effect on this, as we have established in the theory chapter that this can have either positive or negative impacts.

5.4.2.1 Is the perception of the residents concerning forest resources changing?

In order to respond to this part of the research question, we asked local residents of Juma to rate the importance of different types of forest use. The options given to them were: fishing, timber, firewood, hunting, harvesting and we gave an open option (other) to see if there were or are any intrinsic values of the forest for the residents.

Fishing is the most important resource for the residents of Juma (54 people out of the sample reported this as the most important resource), and since the BFP was implemented, there has not been any significant changes in regards to the level of importance of this central resource. Harvesting of forest products (38 people) is the second most important forest use for the respondents interviewed and no significant changes were observed after the execution of the BFP. The third forest use most important for locals was timber (18 people) and the fourth was hunting (17 people). None of the forest uses presented above had any significant changes after the implementation of the BFP, most likely due to the recent initiation of the BFP.

On the other hand, out of 96 respondents, 13 people said that the most important for them was to keep the forest standing. Some of the residents expressed that keeping the forest standing is central for them, since they depend on the forest for survival. One respondent reported that the

forest was important because of spirituality. As we can observe, there have not been major changes in relation to the perceptions of the residents of Juma concerning forest values.

5.4.2.2 What is the effect of the payments on attitudes?

In the theory chapter it has been established that introducing payments can have an impact on attitudes. In order to assess this issue, we will address if there are any norms that affect attitudes, thus making the residents obey the rules. In relation to this, it is also of interest to see if the payments are causing a crowding-out effect on their norms, in which case adverse affects on attitudes could be expected. On the basis of this, we have devised the following sub-questions:

i. Are there any internalised norms that make forest dwellers obey the rules in addition to payment incentives?
ii. What are the possibilities for crowding out effects?

As the BFP is still in implementation phase in the Juma reserve and only one out of the four components is up and running, the effect on attitudes is still difficult to measure. The data shows that roughly half the residents are familiar with the BFP rules, i.e. they are aware of the changes they must make in their practices, and they have been informed about the importance of protecting their resources, both for the environment and for their own social and economic development. Nonetheless, we found some irregularities during our surveys, relating to how much the residents actually can say about environmental protection.

When asked what they learnt during the mandatory information meeting that all participants must attend in order to participate in the BFP, most mention no deforestation, no slash-and-burn, and forest conservation as important topics. Yet 35 out of 89 respondents who attended at least one information meeting could not remember anything specific, equalling nearly 40% of the interviewees. In addition to this, some people attended several information meetings, as they are opportunities for social interaction. Yet even those who had participated in meetings just one month before our study began had trouble remembering what had been discussed. When questioned further, all knew, however, that deforestation is illegal, and some additional

rules, but they were unable to provide this information on their own. The challenges of disseminating information will be discussed later in the discussion chapter in section 6.2.1.

The data from our questionnaires show that over half of the interviewees have changed their attitude towards the forest after the implementation of the BFP (see Figure 14). When asked in the BFP has had any effect on their attitudes towards the environment, 64% (61 out of the full sample of 96) confirmed this, while 36% (35 respondents) replied that the programme had had no effect on their attitudes. We further asked if the residents knew anything about forest protection before the BFP started (see Figure 15). Seventy-eight percent (75 respondents) of respondents replied they did not. This can suggest that the BFP has introduced a lot of new information about the environment and forest protection, and this information is slowly taking effect and changing attitudes. The charts suggest that the BFP has had a positive effect on attitudes towards the forest.

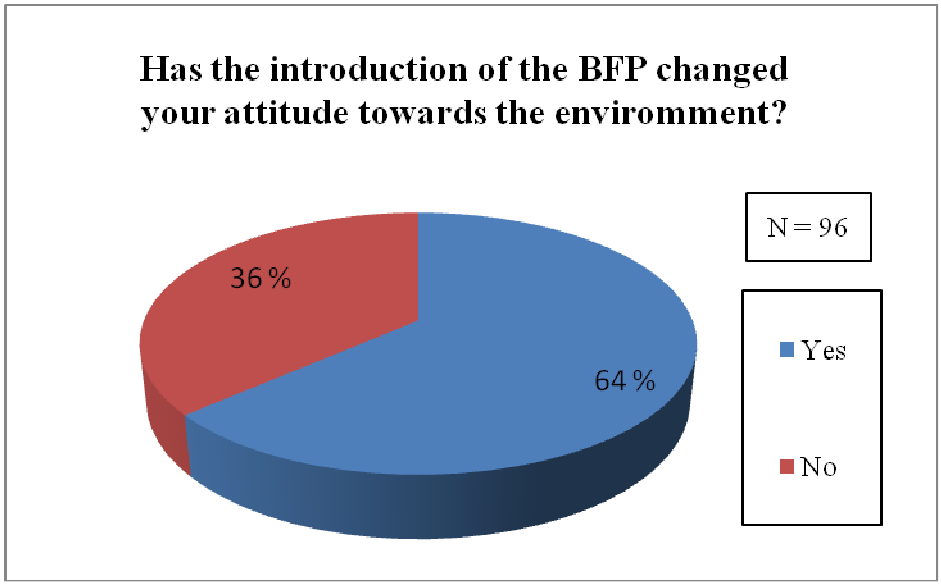

Figure 14: Changes in attitudes towards the environment after the implementation of the BFP (Question 34 – Has the introduction of the BFP changed your attitude towards the environment?)

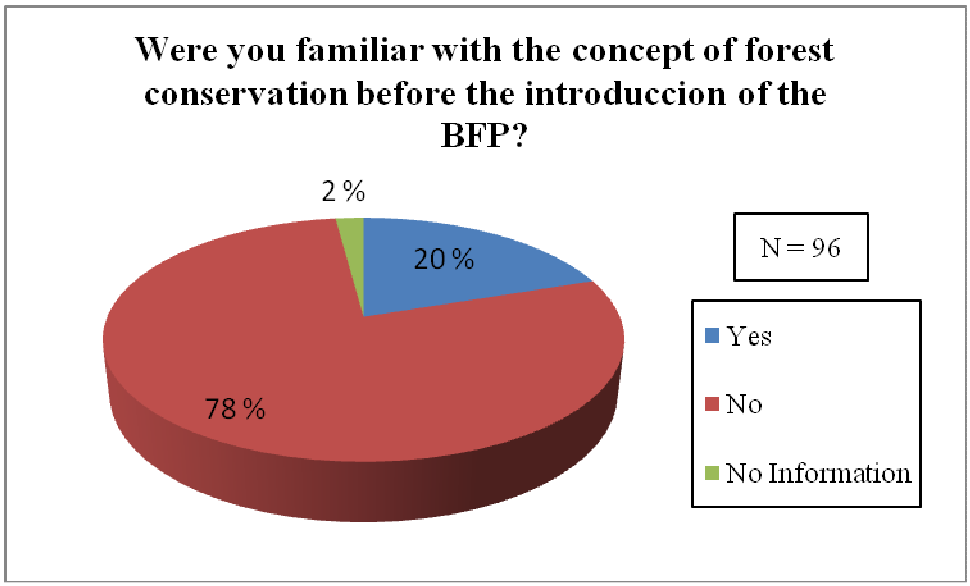

Figure 15: Familiarity of the residents with forest conservation before the introduction of the BFP

(Question 34.2 - Were you familiar with the concept of forest conservation before the introduction of the BFP?)

When looking for changes in norms of protection towards the forest that could make residents want to protect their resource in addition to the payments they receive, one can look at how they view the payments and any past activities related to deforestation. As mentioned before, the forest dwellers mostly only take what they need from the forest. Based on our observations and conversations with the residents, they mostly only cut down trees to make their houses and clear areas for cultivation, and unless they had no other opportunity for income, very few participated in large-scale logging. This strengthens the idea that they are aware of their dependency on the forest and its resources, and when discussing deforestation with the residents, many voiced that they did not like it and avoided it when possible. They were very conscious of the effects it had on the air and water quality, and they realised how beneficial the trees are for shade and protection. They did not like outsiders arriving to log, or take any other resources from the forest, as this not only represented a loss in income for them, it also disturbed their living environment.

Many also expressed that they were worried that their children would grow up not knowing or experiencing everything the forest had to offer to them. But this does not necessarily translate to norms of protection. Due to the lack of education and poor living conditions, very few people knew about environmentally friendly practices, and it was common to dispose of rubbish in the rivers as people simply did not know or realise that this could be harmful to

their environment. This is confirmed by interviews with FAS, who mention that while the residents do not have any scientific knowledge about the forest, they know that their practices and methods work and give results, and they protect the forest from tradition, not from a scientific viewpoint. Most communities live harmonically, based on necessity and do not take more than they need. Some may think in more individual terms of gain, but most recognise alternative values of the forest, which shows in their practices (pers. mess. Cristo 2009; pers. mess. Pinto 2009; pers. mess. Schwade 2009). It could also be that the forest dwellers did not possess the capacity to cut more than they did, as deforestation is time costly and heavy work, often unbearable in the heat, and demands advanced tools. From our observations and information provided by FAS, the residents lack the necessary tools for large-scale deforestation.

It seems from the results above that the residents do have certain norms of protection, and at the same time are physically unable to take more from their environment. Thus, the rules do not come into conflict with their behaviour, and problems are virtually non-existent. If the rules had been in conflict with these norms, we could expect more coordination problems and bigger challenges in changing behaviour and attitudes. There are very few rules that actually change behaviour – as many did not deforest on a large scale before, there is only the issue of zoning of forest product harvesting that alters the habits of the residents. This requires that the residents change their habits and can make it more costly, but does not prohibit the action. Likewise, other rules concerning participation, sending children to school, etc. are not large changes in their daily behaviour and should not conflict with underlying norms in the community – many residents seemed pleased about the programme, the attention they are getting, and the changes that are being made to the socio-economic situation in the reserve.

The introduction of monetary incentives can result in the crowding-out of behaviour based on intrinsic motivation. It is worth asking if the residents of the Juma reserve experience this, or if they are able to benefit from both the payments and illegal activities (if this was common before). Alternatively, they could simply not engage in monitoring activities, as the payment has crowded out any previous norms of protection, yet illegal activities are still prohibited by law. This is related to how they actually perceive the payments, and hence if they cause a crowding-out effect. When asked about any changes that had to be made in order participate in the programme, many respondents revealed that they did not actually have to change their behaviour much in order to comply with the BFP rules and receive the payments. As

mentioned above, very few sustained themselves from commercial logging, fishing or hunting, and therefore had little to lose when the reserve was created and the BFP was implemented. Even among these few, several of them support forest protection and approve of the new rules – they only miss better economic support to replace their previous livelihood activities.

We feel that from the residents' point of view, the payments are not so much a compensation for reduced opportunities, as they are a form of financial support for an already challenging life. In addition to this, it was not our impression that many residents considered why they had received the payment – they were just happy to get it and expecting an increase in the payment level. Regardless, we did not actually pose this question to the interviewees, due to limiting factors as mentioned in the chapter 4.3.2 on the household survey and pretesting. During our fieldwork we gained the impression that many residents are waiting for the state government and FAS to provide more help for them. Moreover, the forest dwellers do not necessarily see their actions as environmentally friendly – due to their living conditions and the nature of their environment they could not do much more damage to the forest. It seems that the residents do not protect the environment due to internalised norms, but because they want to protect their future, for themselves and their children. Hence, crowding out does not seem to be an issue for the BFP so far.

5.4.3 What role does the interaction between the reserve and the BFP play in changing the attitudes and the behaviour on the ground?

As mentioned above, the legal status of the Juma reserve can be interpreted as an extra security that encourages the forest residents to report illegal behaviour and cooperate in complying with both the reserve and the BFP rules. It is our impression that at this point in time it is still very difficult to separate the reserve and the BFP. They are intertwined; both for the residents as they do not seem to clearly separate between the two during their answers, and for observers looking for effects of either on say, deforestation. The BFP works as reinforcement, reminding the forest dwellers of the reserve rules, while in turn the reserve provides legal protection and possibility of stricter punishment than BFP.

Together they have a management plan that has common goals and aims for the reserve, carried out by FAS and other organisations in cooperation. Together the reserve and the BFP

are a strong force, complimenting each other where the other is weak. The reserve rules, for example, would be very hard to monitor and control without the introduction of the BFP and the encouragement of local participation. The BFP also works to bring people together, connecting people and providing facilities such as education and health stations and other local needs that the state is currently unable to supply. The reserve also protects the BFP, giving the legal backup to the rules, which would be harder to enforce if it were not for this fact.

It is clear that the Family component payments would not have much effect on their own; the other programme components will play an important role in changing behaviour and attitudes towards the forest, as the residents see more opportunities arise to take advantage of. The payments clearly work as a hook, enticing people to participate and giving an immediate positive appeal. FAS calculate that in another five to ten years, more effects will be visible, such as permanent changes in behaviour and attitudes. This is how long it is estimated to take to get all the other BFP components up and running. Additionally, there may be more visible effects of the education endeavours.

Some questions, such as what residents would do if they saw somebody deforesting illegally, reveal the interconnectedness of the reserve and the BFP. Most people state they would report the person committing the act, or warn the closest authorities. The most common reason for this action was that the rules now dictate that deforestation is illegal, and the residents felt it was both their duty to report people taking their resources, and their right as residents. The reserve has thus given the residents a sense of authority, and empowerment in protecting their resources. The rules of the BFP and the reserve that prohibit logging have thus created a sense of importance in the residents, resulting in their involvement in what happens in their surroundings. They have also become more aware of the importance of their resources and the part they can play in monitoring them. Lastly, when asked in the BFP helps protect the forest, some interviewees mentioned that the reserve helps more, while the BFP helps their family to a larger extent. This further supports the idea that together the reserve and the BFP provide a framework for reducing deforestation and improving life quality, completing each other where they lack resources.

Looking at the data from the interviews, several points support the idea that the reserve plays an important role in the functioning of the BFP and the reduction in deforestation. When residents were asked if they had changed their logging habits, 35 out of 96 reported that they

had reduced or completely stopped deforestation (although during the fieldwork we discovered that many only ever logged to build their houses anyway). Out of those reporting change, 38% (14 out of a total of 36 answers), cited that the creation of the reserve was the reason for their change, while another three mentioned that they felt the need to obey the rules to avoid punishment. In contrast, only two people mentioned the BFP payments as a cause, while eight gave knowledge about the environment as an answer. The remaining respondents (five answers) said the need to log was removed, and the remaining gave other undisclosed reasons for their change (see Figure 16). It was also mentioned that the reserve provides protection for the residents from outsiders who arrived to fish, hunt and log for commercial sale. In relation to people who mention rules as a reason, it was not specified which rules they were referring to – the reserve or the BFP. If they mean the reserve rules, they could be referring to limitations of activities, while if they mean the BFP rules, they could be referring to losing the payment.

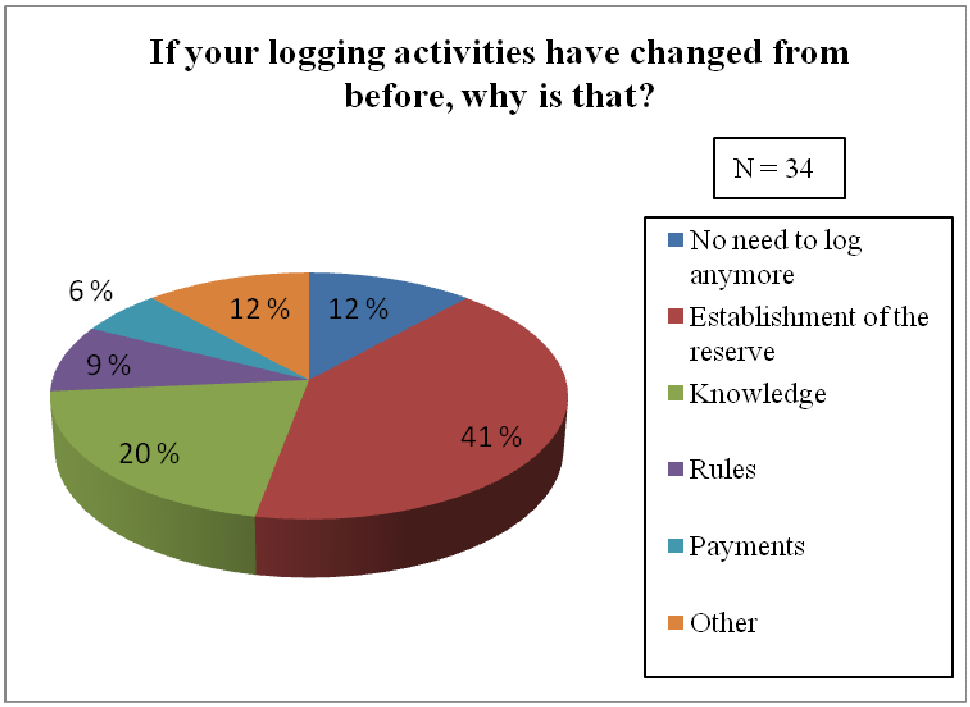

Figure 16: Reasons for changes in logging activities

(Question 36.1 - If your logging activities have changed from before, why is that?)

In relation to the answers in Figure 16, some categories of answers could be merged together, for example the rules and the establishment of the reserve, or the payment and no need to log anymore. However, we could not be sure of the real meanings behind the answers provided.

Similarly, we asked about the perceived or believed changes in the rate of deforestation in the reserve by the residents (see Figure 17). A total of 92% of the respondents confirmed that they thought that deforestation has indeed decreased (88 people). In comparison, six people did not know, while only two reported that deforestation had increased, stating that there is a lack of control to deal with logging. Those who saw no change or believed there had been increases commented that people did not seem to care about the forest, or that deforestation never had been a problem in the area, i.e. people only took what they needed to build a house.

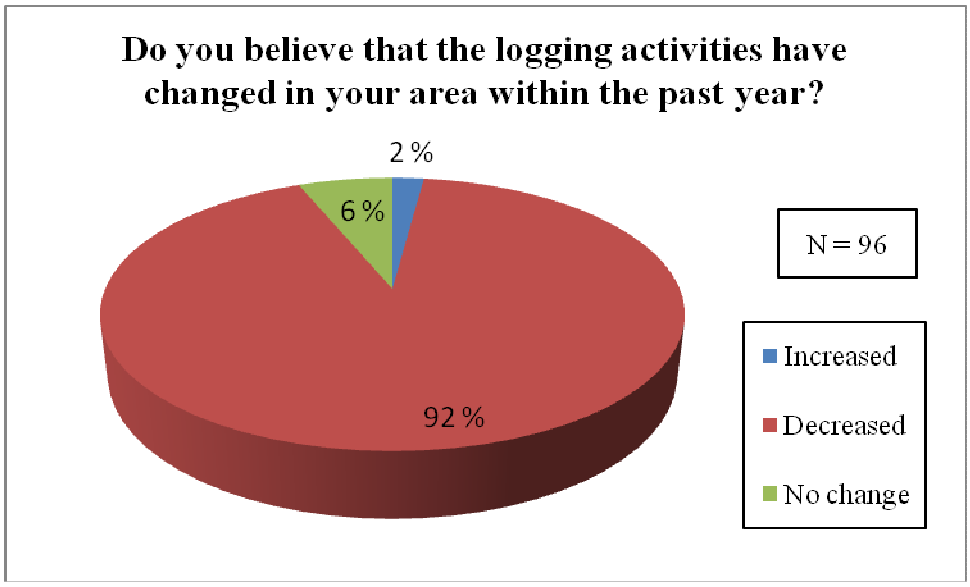

Figure 17: Perceived changes in logging activities in the past year

(Question 39 – Do you believe that logging activities have changed in your area in the last year?)

Among those who believed deforestation had decreased, the reasons given for these changes varied. The establishment of the reserve seems to have made the biggest impact on deforestation in the eyes of the residents. 60% of the answers (64 answers out of a total 106 answers from the residents) named the reserve as the biggest factor affecting deforestation trends, with new knowledge and education on environmental issues counting for 25% of the answers (26 out of 106). Other answers included the Family component payment, which was 8% (nine out of 106 answers), better communication (two answers) and lastly, four people could not answer the question.

5.4.4 How are the resources provided by the BFP used by the recipients?

5.4.4.1 What are the material benefits and improvements of livelihood security for individual households?

To find out how the economic resources (the payment) provided by the BFP are used by the local communities is an issue of great importance for this study. As mentioned in the theory chapter, introducing funds into communities could improve and develop livelihoods, yet it can have negative side-effect. This will depend on local perceptions about the payment and how households are using it. It is relevant to mention that if the payment allows local people to buy more, it does not necessarily imply that it will develop local livelihoods or induce livelihood security. To know how local dwellers are using this new income from the Family component will contribute to answer this question.

Our survey included questions on household spending after receiving the Family component payment. The data revealed that 88% (84 people) of the households were buying more than before the BFP started, while six (6%) replied no. One could expect that the BFP would have a positive effect on purchasing possibilities for families. However, when taking into consideration the low level of the payment, and the recent increase in manioc flour and Brazil nut prices, it is difficult to estimate the impact the BFP payment has on income (see Figure 18).

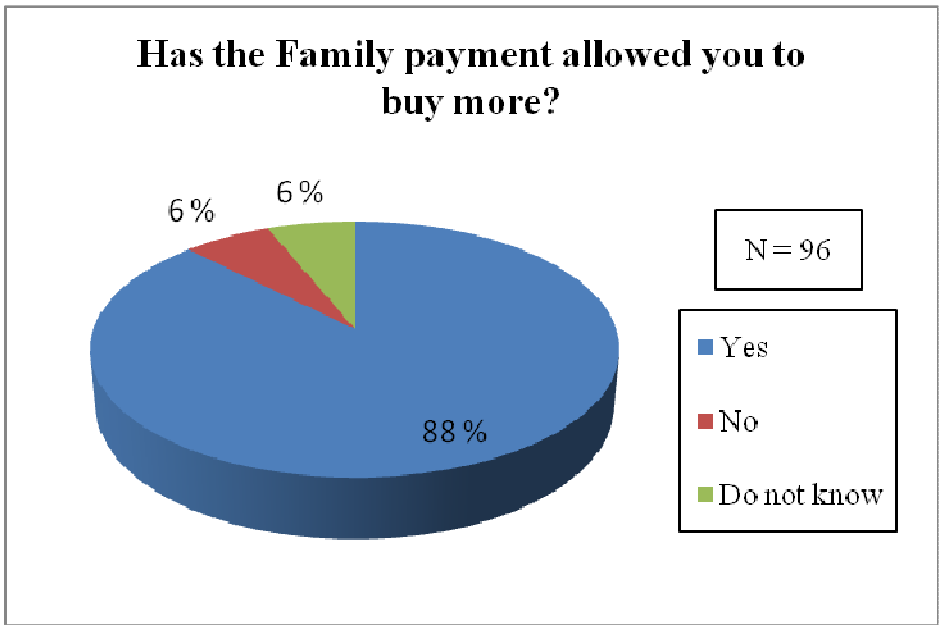

Figure 18: Effects of the payment on purchasing power of the residents

(Question 13.1 - Has the Family payment allowed you to buy more?)

To find out what are the material benefits for individual households we asked what were they purchasing with the payment (see Figure 19). The findings show that 45% (57 out of a total of 127 given answers from the respondents) of the households consulted are using the payment to buy food, which can lead to improved health conditions within the communities. Another 20% (25 answers) replied clothes and shoes, while 11% mentioned gasoline (14 answers), 9% (11 answers) mentioned gas for cooking, while 13% (17 answers) mentioned various other items, such as school supplies and personal items.

One argument that can be made here, is that the payment is being on spent on what FAS intended it, namely food and other important household items. One can speculate if the idea behind giving the women the payment has thus paid off, since all items mentioned are necessary for the household and the payment does not seem to be spent on other items such as alcohol, taking into consideration that alcohol abuse is a problem within the communities.

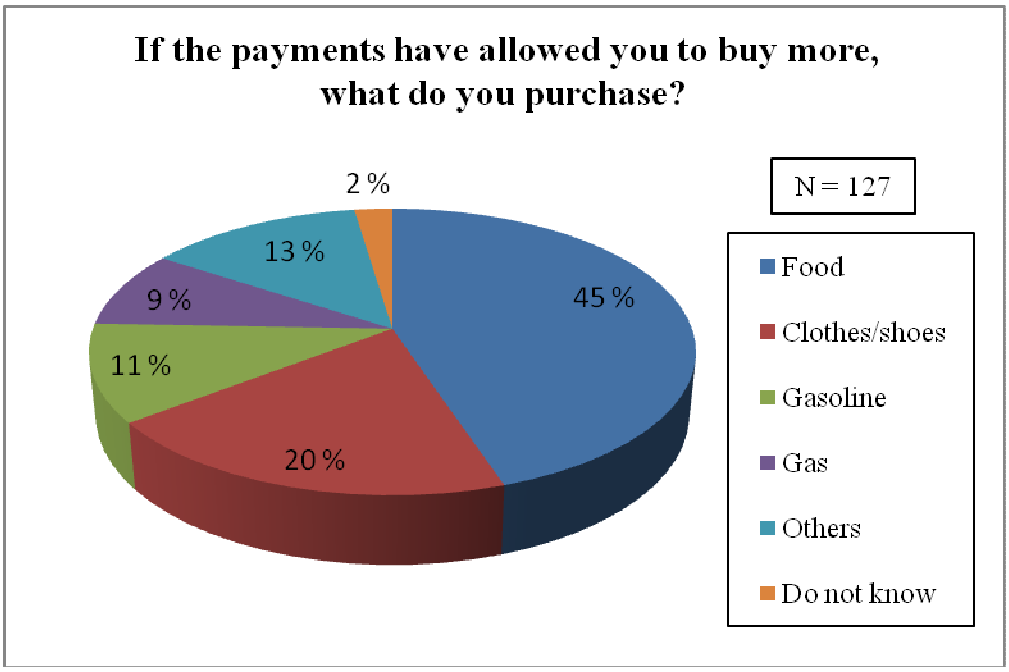

Figure 19: Items purchased by the households with the money received from the Family component

(Question 13.2 – If the payments have allowed you to buy more, what do you purchase?)

Related to the issue of livelihood security and the Family component payment, crowding-in is a possible negative outcome, as it may encourage the movement of others to the area in an attempt to profit from the BFP. This may distort local livelihood strategies, by reducing new possibilities for the local residents to improve their income opportunities and making previously used resources sparser. This could be detrimental to the BFP and the environment, and make the goals of the programme and the reserve harder to attain. However, according to BFP rules, in order to receive the payment one needs to live within the reserve area for at least two years, which must also be confirmed by the president of each community. This has been set up in order to avoid attracting people to the area solely on the basis of the payment. Nonetheless, only twenty of the respondents had not been born in what is today the Juma reserve, and out of these twenty, only four people had spent less than ten years in the reserve, and none had arrived within the last two years. Most had arrived because of personal reasons (marriage, family, etc.). Thus it seems that arrival of people to the reserve was not an issue at the moment of our fieldwork, and adverse effects on livelihoods security are currently not a threat.

There is a bigger problem of controlling that those who receive the payments actually remain in the reserve and have their source of income from there, as we saw many empty houses during our visits to the communities and experienced that the majority of families have their own house in the town of Novo Aripuanã, or their relatives have one. According to one conversation with one FAS employee, they could observe that some people have moved to the city but still receive payments. FAS do check this to confirm that the family has moved, but this takes time, and it is difficult to determine if the entire family has moved, or just some members, as many parents may accompany their children to continue their education. To our knowledge, it has only occurred once that a family lost the payment due to this.

To sum up, the economic resources provided by the BFP are being used by individuals as a complement to their income. They are buying mainly food and clothes, but beyond this is not being invested in any way to further enhance livelihood security, such as tools or equipment for production, as new income generation activities have not yet been fully introduced.

5.4.4.2 What are the education and healthcare benefits?

The FAS school has been a positive addition to the forest dwellers' life. In Juma, 22 % of the population of 6 years of age and older is completely illiterate, while only 16 % have completed the first level of basic education equal to four years of school (FAS 2010a:51). The school offers four more years of education beyond the fourth grade, with programmes available both for adults and teenagers. It is run on a two-week basis, when students are gathered from the surrounding communities and delivered to Boa Frente using the transportation provided by FAS. There they stay for two weeks attending classes and participating in practical activities. The students also receive meals during their stay at the school. After two weeks they are sent back to their communities where they are supposed to work on individual assignments. Attending students are split into two groups: teenagers of ages 13 to 18, and adults who wish to continue their education. The total number of students enrolled in 2009 was 58. The teaching personnel are provided by the State of Amazonas Secretariat for Education and Teaching Quality (SEDUC), except for the agro-ecology instructor, who is contracted by FAS (pers. mess. Schwade 2009).

The structure of the school and the teaching methods has been designed in close cooperation with the experts from FAS and SEDUC. The educational programme has the implicit goal to

incorporate objectives of the BFP. However the main focus is on the issues immediate to the students' life, so that they can form a connection from the knowledge they receive to their reality. Discussions with the local people themselves were held before starting the educational programme. The schedule is adjusted to the students' needs and daily routine (pers. mess. Schwade 2009).

One of the focal points of the programme is practical knowledge introduced through agro-ecology classes held at an experimental base located next to the school building. Students are educated about various plants and organisms and how they interact. Programme designers hope to introduce new ways of cultivation as well as new crop cultures into the current agricultural pattern. There is an urgent need to diversify the local diet and introduce more vegetables and amino-acids, improving nutritional conditions and reducing dependency on a single product.(pers. mess. Pinto 2009; pers. mess. Schwade 2009).

These unorthodox methods have not always met support. Some of the adult respondents remained sceptical about the quality of education, commenting that students spend more time at home than attending classes, due to the way the school is organised in two-week shifts. Due to practical issues, students can remain at home for more than two weeks before they are called into class again. Some few students also voiced that they had too many breaks and spent too much time working with agro-ecology. Others voiced concern that it is easy to forget everything learned during the two weeks of break between the study sessions. The results of such methods may remain unclear unless some practical application of the knowledge acquired starts taking place in the everyday life of the communities, which is yet to happen as the programme is new. As FAS representatives themselves have admitted, they have more hope in relation to younger generations when it comes to disseminating new knowledge (pers. mess. Pinto 2009).

To assess what are the education, healthcare benefits and new business opportunities that the BFP was providing until now to the residents of Juma, we asked what other benefits the residents receive from the BFP. Our survey revealed that 77 (80%) people from the sample were not receiving non-monetary benefits. This can be partly explained by the fact that the components of the programme that will provide these benefits are still in the process of implementation. Nonetheless, the majority knew about the benefits offered elsewhere, especially the FAS school.

Out of those receiving, sixteen out of 24 answers mentioned the FAS school (67%), while only four answers related to the improvements in health services (17%). One person mentioned the courses, another one mentioned business opportunities and jobs (4% each), while two did not know how to answer the question (see Figure 20). In addition to these answers, five more respondents who have not mentioned school as one of the benefits have acknowledged its positive effect on their livelihood when answering a different question about the effect of the programme on their family.

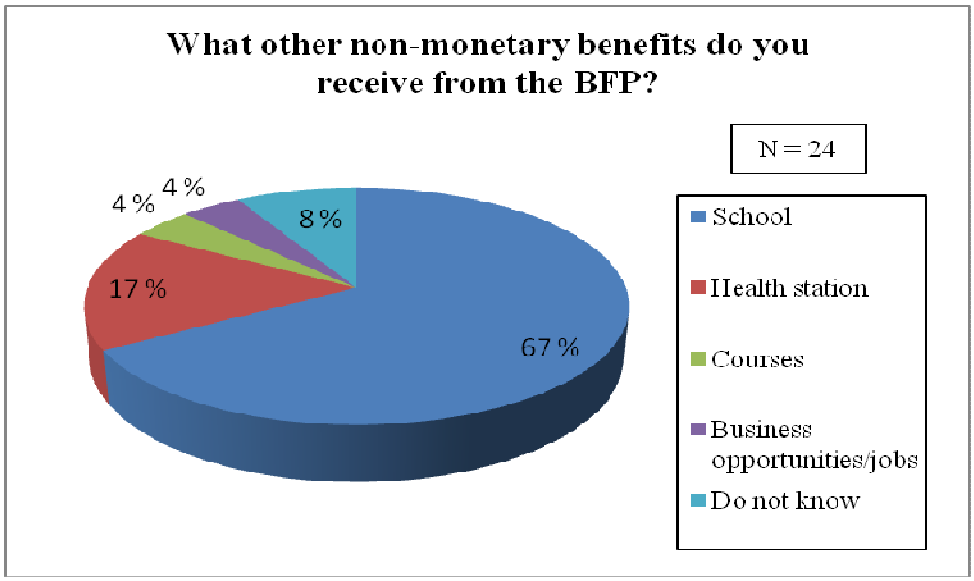

Figure 20: Which non-monetary benefits do the residents receive?

(Question 24 - Which other non-monetary benefits do you receive from the BFP?)

We did not differentiate between the respondents whose children reached the age suitable for attending the FAS school and those whose children are too young, or even those older respondents who may be unable to attend due to family priorities or other issues. Thus such a low fraction of respondents aware of this non-monetary benefit may be attributed to the fact that their children are still too small to use the facility, while parents themselves may not be interested in continuing their own education at this point. In addition, among our respondents, only 36% have completed the first four years of schooling, thus attending the FAS school would not be an option for the remaining 64 % of our sample. For those who have not completed the first four years of basic education, FAS does not provide any schooling options, and it is up to the individuals to complete their education if they wish to participate in the FAS school.

Respondents who named the school as one of the benefits have acknowledged that they have a unique opportunity to continue their own education, as well as their children's, beyond the 4th grade without having to relocate to the nearest town, and most seemed to be appreciative. Some remained sceptical about the fact that they will have to send their kids to school located in other community for two weeks without parental supervision. These respondents preferred to have a teacher present in each community who would be capable of providing the same education as in the schools built by FAS. However it is worth noting that 15 out of 21 positively responding to the presence of the FAS school reside in the communities located within one hour of travel to the community of Boa Frente where the school is operating. Thus it may be possible to conclude that at the moment the benefit of continued education has not been distributed evenly among the participants of the programme.

Lastly, we wanted to evaluate what local people think about the non-monetary benefits. Since very few receive non-monetary benefits yet, the opinions given here are based on those residents who actually have access to these facilities. As education is the most available benefit, we can assume that their answers mostly refer to this facility (see Figure 21). The surveyed households that expressed their opinions about the non-monetary benefits did so referring mainly to the school. The households benefiting from the school seem to be satisfied with it. Only one percent of the interviewed households said that the school was bad. Two percent said that the school was good but needed to be improved, referring to the comments mentioned above.

Moving on to the healthcare benefits that local communities are receiving from the BFP, we can report that FAS has built a health station in Boa Frente. However the personnel that staff this station is hired and paid by the Amazon State. At the time of our research we did not see that the health station was open, there were no doctors present, and we could not see if it is working. FAS have also bought a fast boat that is used as ambulance to transport injured or sick people to the city.

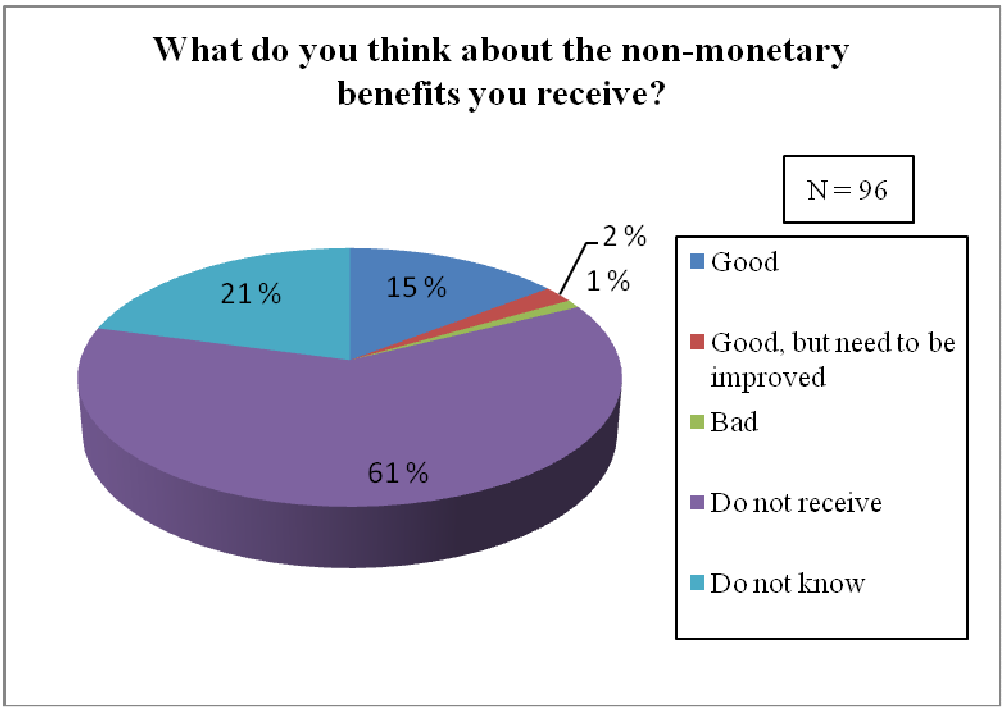

Figure 21: The residents' opinions of non-monetary benefits that they receive

(Question 24.1 - What do you think of the non-monetary benefits you receive?)

5.4.4.3 What are the new business opportunities provided by the BFP?

The courses offered so far by the BFP are courses on Brazil nuts, culinary training, and seed collection. The course on Brazil nuts covers new techniques of preparation for sale, and market introduction, enabling the residents to increase productivity and achieve a higher price for their goods. The culinary course is mainly for women, and introduces new alternative food uses and preparation methods, as well as basic sanitation when cooking, in order to improve diet and health. The seed collection course teaches collection methods such as rappel.

In Juma, the most common income generating activity besides agricultural production, is harvesting of Brazil nuts. According to the individual questionnaires, whenever the respondents indicated that they practice extractivist activities, most of them referred to Brazil nut collection, with 89, 82 and 78% for the communities located along the rivers Arauá, Mariepauá and Aripuanã respectively. The information on high trends on nut harvesting within our sample is confirmed by data obtained from the Juma Reserve Management Plan: 56, 65 and 71 % of all forest extractivist activities are related to Brazil nut collection in the

communities along these rivers respectively (FAS 2010a: 60-62). From the total quantity collected, only an insignificant part was designated for in-house consumption, while the rest was meant for sale.

Due to this trend, the first activity launched under the Income component in Juma was related to the harvesting of Brazil nut. Activities aiming at strengthening producers' cooperatives and capacity building for production have been organised. Related courses have been arranged in four different communities, where participants were educated about better harvesting methods, storage, market conditions, and price negotiations as well as about compliance to zoning regulations according to the Management Plan when choosing area for harvesting. Two nut drying facilities are currently under construction and funds have also been allocated towards the purchase of the boat which would transport the ready produce (FAS 2010a). In addition, FAS helps to cover transportation costs for the participants of the courses who live in different communities.

For the seed collection course, which is not yet widely implemented, FAS has also provided rappel equipment and practical lessons on its use, which are also offered in Boa Frente. The course teaches new techniques and encourages the participants to expand their livelihood strategies.

Our data shows that most people are not familiar with the courses offered by the BFP. Sixty-five respondents did not know any courses offered by the BFP. Among the remaining 31 people (who gave 36 total answers), 17 answers (47%) indicated the Brazil nut courses, 13 answers (36%) indicated the culinary course, while six (17%) concerned the seed collection courses (see Figure 22).

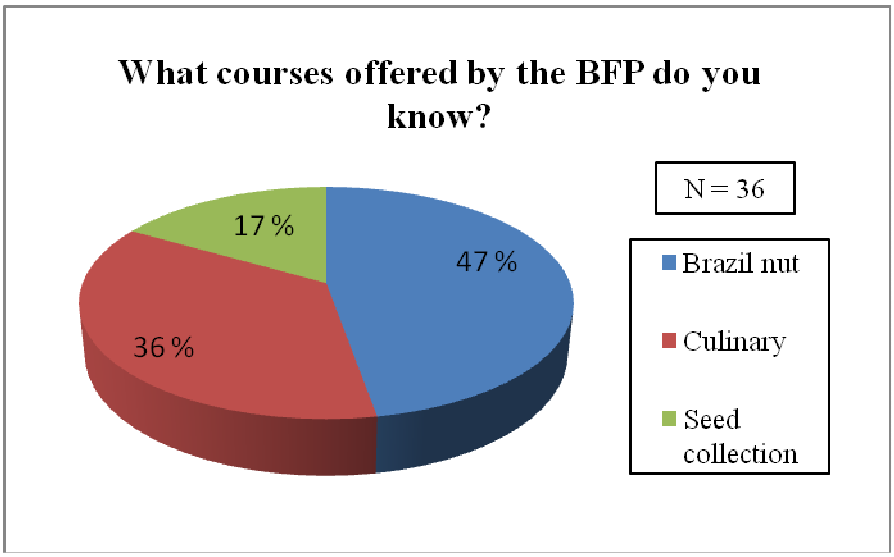

Figure 22: Courses offered by the BFP that the residents are familiar with

(Question 28– Which courses offered by the BFP are you familiar with?)

Only 19% of respondents (18 out of 96) had participated in courses offered by the BFP, and among these, the course on Brazil nuts was the most attended (see Figure 23). Out of the entire sample, 17 respondents were aware of the existence of the Brazil nut course and 11 have attended it. Six people out of the 18 (33%) who had attended course had participated in the culinary course, all women. And we only spoke to one person who had attended the seed collection course (6%). Some respondents mentioned that they heard that some courses exist, but could not specify which ones and where, while some expressed dissatisfaction with the fact that they would like to go, but lacked information on location and time. All actual participants have rated the course they attended as 4 out of 5, being good. One participant indicated that the course helped him get a contract with the nut processing unit.

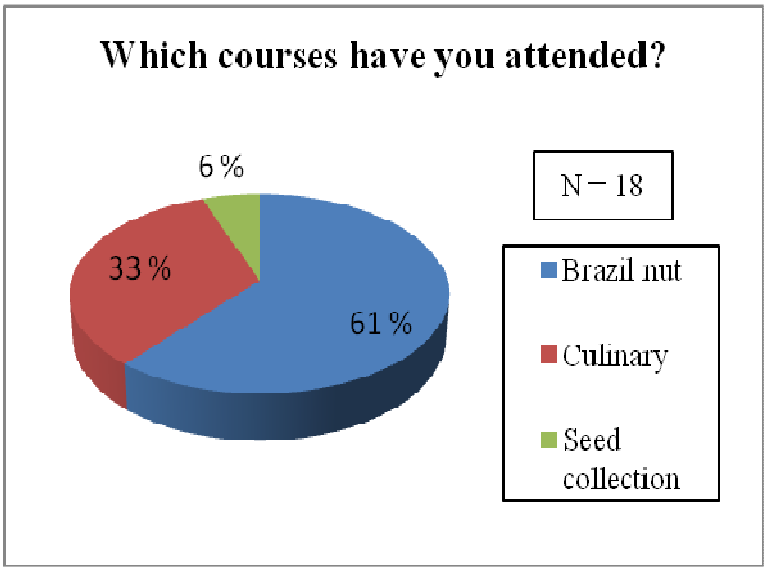

Figure 23: Which courses the residents have attended

(Question 29.1 - Which courses have you attended?)

When interviewing FAS, we were told that they have planned other activities, but have not yet been able to get fully started with them. By asking the residents which courses they were familiar with and had attended, we gained insight into the level of implementation so far. As seen from the data, this component is very new, not well announced and has not yet introduced a wide range of income generating options to the communities.

As of the time of our fieldwork we were not aware of other plans under the Income component in Juma reserve. The people in the reserve who we spoke to did not have a clear vision of how this can improve their livelihood security. They did not seem to fully understand the process, probably due to lack of hands-on experience. Phrases such as "The payment is low, a lot of promises were made and nothing is happening" were not uncommon, as people expressed concern related to restrictions on agricultural activity, since many viewed it as the major source of cash income and did not always comprehend how exactly their production will be affected. Such reaction is to be expected when the programme is not well established and people are reluctant to accept what is outside of the scope of their familiar routine. FAS also seem to lack the capacity to organise courses continuously, and inform residents of their occurrence.

5.4.5 How effective is the BFP in terms of educating communities about the importance of the forest?

One of the objectives of the BFP is to increase environmental awareness among the inhabitants of local communities, and at the same time promote environmentally sustainable activities to support and encourage environmental protection in the area. However, since the inside threat to the forest is minimal, one of the main goals of the BFP is to help defy the external factors damaging the forest. Increasing environmental awareness is achieved through education information efforts, by the FAS school or by information meetings that all participants must attend.

Concerning the attitude of local people towards the forest, we are under the general impression that they were not completely aware about environmental protection before, due to a lack of information and low level of education among the residents (see household information chapter 5.2.3). Many of the respondents said that they did not think much about the importance of the forest, and that now they are more conscious about the value of it and of the environment.

The effectiveness of the education efforts from FAS about the environment can be measured by how much the residents know about environmental protection, and how much they remember from the meetings and classes, and discussions with FAS personnel. There is also the issue of information dissemination from FAS in a short period of time, which could have an effect on the effectiveness of education efforts.

It is important to mention that even though the respondents had some problems in answering questions made by us related to the forest values, it is wrong to assume that they are not fully aware about the importance of the forest as whole. The problem they had in answering questions about these issues may be explained by different reasons; one of them is the fact that education opportunities are scarce, and the residents may not be familiar with the concepts we asked about. During our stay we could observe that local inhabitants of the Juma reserve do not see the forest only for its market value. The forest is the place where they live and were they are able to do so in a particular and different way, they depend on the forest resources, and they are the most interested in taking care of them.

Local people are not a threat for the future survival of the forest; outsiders are the ones who were coming to Juma to exploit resources. In various conversations during our field work,

some residents said that local people had in some situations been paid to clear the forest or fish for commercial purposes. After the creation of the reserve and the implementation of the BFP, local people have noticed an improvement of their natural resources, such as species of fish returning and improved local climatic conditions now that forest clearing has decreased.

5.4.5.1 Have the education efforts had an effect on the attitudes of the residents towards their resources? Do they see the forest for its use-value only, or do other intrinsic values matter?

In assessing any changes in attitude towards the environment, we asked if people felt their attitudes had changed since the implementation of the BFP, including effects from education efforts. As mentioned above in section 5.4.2.2 (see Figure 14 and Figure 15), over half of the respondents confirmed that the BFP has an effect on their attitudes towards the forest. Our respondents also reported that they used to log more in primary forest, and now they are doing so mainly in secondary forest. Seven people said that they were clearing forest, fishing and hunting to get extra income. It can appear that after the implementation of the BFP residents are more environmentally conscious, and use their cultivation areas better, and do not expand their cultivation beyond secondary growth areas. However, it is difficult to measure the impact that the education efforts play in this, since the programme is new, and the components have not been fully implemented throughout the reserve, and the information given by the programme is not yet completely clear and understood by the residents of Juma.

For results from what the residents learned during the information meetings, please see section 5.4.2.2. It is then relevant to see if what the residents remember from the information meetings affects their behaviour and agricultural practices. Thirty percent (29 answers) of the respondents reported that the information had indeed affected their behaviour and actions (See Figure 24), while sixteen respondents (17%) reported no changes. Many said that they were cultivating now just in the capoeiras, and that they were more conscious about the environment.

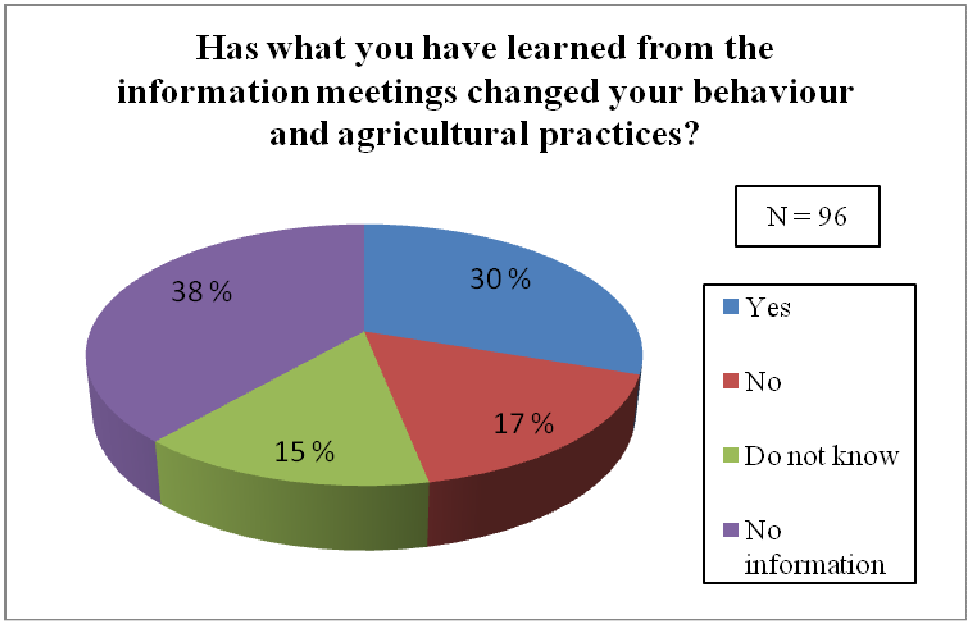

Figure 24: Effects of information meetings on behaviour and agricultural practices

(Question 25.1 - Has what you have learned in the first meeting of the BFP changed your behaviour and agricultural practices?)

5.4.5.2 To what degree are the residents participating in the BFP??

This question addresses the level and type of participation of both the communities as a whole and the individual residents in the BFP. By assessing participation, we can estimate how effective the BFP is in terms of educating the residents and changing attitudes, motivation, and behaviour. Based on this we have formulated two sub-questions:

i. How are the communities participating?
ii. What is the level of individual participation?

This question addresses to what degree the communities are participating in education on sustainable business and environmental practices, and in which ways they are participating. We wanted to evaluate the activities that are part of the Income component. This component of the BFP was designed to facilitate sustainable production which would help generate more income for the forest dwellers, without engaging in illegal activities such as deforesting or harvesting other protected products. The financial resources will be invested in activities

which will inform the community members about sustainable use of nature and educate them about market conditions. However this component has not been fully implemented yet.

In relation to the participation at the community level, the Association component aims to strengthen community organisations, promote participation and build local capacity to run the BFP together with FAS within the different communities in Juma. However, it has been established within the BFP that communities must have a resident association where community issues are discussed. Based on our fieldwork, we could say local organisations have a very passive role in the meetings organised by FAS with each community. What is going to be discussed is presented by FAS, or other state authorities. We could assume that this participation is functional and can be regarded as a professional-guided participatory approach. In this approach local people may be engaged in decision making, but only after central decisions have been made by organisers, meaning that people just approve or disapprove what have been previously decided by external actors.

Nonetheless, FAS has assured that all participation is voluntary, and residents still get access to non-monetary benefits of the BFP even if they do not participate actively. Another side of participation promoted by FAS is the inclusion of women in decision-making and in society, by the format of the payment, as discussed above in section 5.3.2.1.

In regards to community participation in the BFP, we asked interviewees if they thought that their communities are involved in the programme, in an attempt to assess local involvement. Out of 96 respondents, 79 confirmed that they view their communities as involved, while ten people reported they did not feel that. Another five responded that their saw their community as more or less involved. When asked why they felt this way, the most of them reported that it is because the majority of the community participates in the meetings and thus feels involved in the programme. A few others reported that they felt involved since they received payments, and followed the rules.

We have mentioned that FAS has used the Family component (the payment) to encourage participation at the individual level. The payment was designed as a “hook” to attract people to participate in the programme. According to the three approaches presented in the theory chapter, we could say that the first type of participation that the residents of Juma experienced was a top-down approach, since the programme was designed without their inclusion and introduced without consultation of all who would be affected by it. From this we could assume that people accepted the BFP as they realised that they would be offered an incentive.

Participation under these circumstances is not sustainable, as if the payments change or disappear, the level of participation can also do so.

Even though all participants have attended the information meetings, the level of active participation and understanding of the BFP does not correspond to expected changes in knowledge and attitudes in regard to the given information. As mentioned before, it seems that attendance is high, yet the information has not been internalised by locals. It is also worth mentioning that attending the information meetings is mandatory condition in order to get the payments and participate in the BFP. This could explain that participation is more passive than active, since residents might not attend meetings out of their own accord, but rather to gain access to other goods and benefits.

When we were conducting our research we also asked our sample if they were working with FAS or helping in some way. Eighty-three people (out of 96) said that they have never worked with the organization or with the programme. Nine people said that they worked with the construction of the school and the side walk in Boa Frente, three women said they were working in the kitchen of the school, and just one was helping to implement the programme among the communities, but did not specify in which way. This reveals that there is little direct participation in the implementation of the programme on behalf of the residents.

5.5 Transaction Costs

It is important to evaluate how costly it is for FAS to establish and operate the programme, and how much the individual households need to input in terms of effort, time, and money in order to receive the benefits provided by the BFP and participate in programme activities. It could also be useful to assess the ratio of costs related to establishment and administration of the BFP in Juma to the total costs disbursed as benefits to the participants of the programme under the various components of the BFP. However the information we can obtain from the financial reports provided to us by FAS cannot disclose the details which would enable us to clearly draw the line between the types of expenditures. The assessment of costs may shed more light on the efficiency of the BFP, which will be further addressed in section 6.7. (Please see Appendix II for full financial reports)

5.5.1 What are the transaction costs of the project, both for the organization as well as for individual households?

This section will cover the information on transaction costs for FAS in relation to implementation and further operation of the BFP, and for the individual households in relation to participation in the programme. Below follows a more detailed description of the costs concerning establishment and maintenance of the programme in Juma for FAS.

5.5.1.1 What were the costs of establishment of the BFP in Juma for FAS?

The assessment of the costs of establishment of the programme in Juma for FAS is based on the documents acquired by us from the foundation officials. It is important to note that these costs only reflect disbursement for various budget positions, but do not correspond to actual expenditures, which may or may not have surpassed these figures available to us. The figures presented below are an approximate estimate as some of the financial reports contain information regarding the costs for the entire BFP in all 14 reserves. Full reports may be viewed in Appendix II.

The estimates we present are far from complete, as the programme is new and some of its activities are yet to start. In addition there will likely be more costs, as further plans may already be made, however we do not possess the financial information in relation to this, and thus the full establishment costs are unknown to us at the moment.

In addition to the costs in Table 2, there are other expenditures that may be attributed to the costs of establishment of the BFP in Juma, yet the exact fraction is hard to determine, since these costs also apply to the other 13 reserves that the BFP operates in. One can say that Juma represents 1/14 of these costs, but these costs would be incurred regardless of the establishment of the BFP in Juma, as they are necessary for the establishment of the BFP in the remaining 13 reserves. For example, the head office of the foundation in Manaus was purchased by the foundation for BRL 1,200,000, while another BRL 700,000 was spent to equip and furnish the office (USD 600,000 and 350,000 respectively).

Another cost of establishment not covered by the financial reports may be related to the formation of the Deliberative Council (see section 5.3.3.1), as setting up the structure of the

council, formulating its agenda and directives, contacting members and disseminating information also incurs costs.

Further we have presented two possible outfalls of the costs associated with the establishment of the BFP in Juma for FAS. The first column (Transaction Costs of Establishment) relates to the expenditures incurred during the process of negotiating contracts, finding the necessary materials and recruiting the labour force, and accessing information. However the documentation available to us does not specify if the figures listed also include the actual value of the delivered outcomes, e.g. price paid for equipment or construction materials necessary to complete various projects under the BFP components. Thus we have created a separate column (Production Costs), in which we have included those disbursement lines which in our opinion may include the actual value of delivered outcomes in addition to the direct transaction costs as explained above.

The costs associated with the pre-validation phase and establishment of the BFP in Juma from April 2008 to December 2009, including projects which are still in progress, are estimated to fall between BRL 3,007,611.50 (roughly USD 1,500,000) and BRL 1,165,977.20 (roughly USD 583,000) based on two calculations, i.e. with and without potential production costs (Transaction Costs of Establishment - Production Costs) (see Table 2).

Some of the disbursement positions are as follows: establishment of FAS operational base (project completed), construction of school facilities including the school buildings, teachers' houses and students' house (only in Boa Frente) all equipped with solar panels in the communities of Boa Frente (completed project) as well as in the communities of Abelha and São Miguel (both in progress). The rainwater collection system and waste treatment projects have been partially implemented in the community of Boa Frente and are a work in progress at the other locations. The electrification project and establishment of the communication bases were also partially implemented at the time of our presence in the reserve. The river-walk construction has been completed in the community of Boa Frente. Costs for inauguration events include expenses associated with formal receptions and transportation costs of carrying the representatives of various businesses, and scientific and political organisations to and from Juma. Disbursement lines for material transportation costs and costs of fuel are related to the expenses incurred during construction phase of various projects. More details on the entries discussed above as well as the other entries mentioned in Table 2 may be found in section 5.3.2.1.

Table 2: Current costs of establishing the BFP in Juma from April 2008 to December 2009, including projects yet to be completed after 2009 (Appendix II)

Disbursement	Transaction Costs of Establishment	Production Costs
Establishment of operational base in Boa Frente	BRL 77,523.95	BRL 77,523.95
Construction of school facilities in Boa Frente	BRL 549,461.98	BRL 549,461.98
Construction of school facilities in Abelha and São Miguel	BRL 483,112.05	BRL 483,112.05
Construction of River Walk in Boa Frente	BRL 201,269	BRL 201,269
Rainwater Collection System and Waste Treatment	BRL 65,624	BRL 65,624
Electrification Project	BRL 287,275	BRL 287,275
Health Post and Equipment	BRL 81,015.72	BRL 81,015.72
Boats (ambulance and community)	BRL 74,799.72	BRL 74,799.72
Antenna and communication equipment	BRL 21,552.90	BRL 21,552.90
Material transportation costs	BRL 78,466.54	
Fuel Transportation Costs	BRL 137,172.42	
Workshops and social mobilization	BRL 52,176.90	
Programme certification	BRL 357,641.02	
Carbon Methodology and Certification Process	BRL 38,517	
Project inauguration events in Juma and Manaus	BRL 147,264.29	
Monitoring base, transportation and equipment (yet to start functioning)	BRL 275,594	
Development of Reserve Management Plan (published March 2010)	BRL 79,145	
Total:	BRL 3,007,611.50	BRL 1,841,634.30

The labour costs associated with among others, working hours, travel, and meetings that were required to establish the BFP in Juma are impossible to assess. This is due to the fact that the idea behind the programme started many years before the BFP and FAS were formally established, when Viana was Secretary of Environment for the Amazon State. Since then, the amount of people and time that went into preparation of the programme has not been accounted for by those involved. In addition to this, when FAS took over the management of the BFP, all staff members worked equally on the implementation of the programme in all 14 reserves. Hence, we cannot determine how many man-hours went into establishing the BFP in Juma specifically. Nonetheless, we have an example of average monthly payroll and administrative costs from FAS, which now holds 57 workers, of BRL 730,188 (USD 365,094). The financial director, Villares, could tell us that the costs related to the BFP in Juma usually amount to 5% (BRL 36,509.40 or USD 18,000) of this figure. If one multiplies this figure by 12 months, one could arrive at the yearly expenditures attributed to labour and administrative costs for establishing the BFP in Juma.

The costs of introducing bank cards among programme participants should be considered as null for FAS[34], since each participant has opened a bank account at Bradesco and the costs associated with it were paid by the bank itself.

5.5.1.2 What are the costs of maintaining the BFP in Juma for FAS?

The assessment of the costs of maintaining the programme in Juma for FAS is based on the documents acquired by us from the foundation officials. It is important to note that these costs also only reflect disbursement for various budget positions, but do not correspond to actual expenditures, which may or may not have surpassed these figures available to us. The figures presented below are an approximate estimate as some of the financial reports contain information regarding the costs for the entire BFP in all 14 reserves.

We have presented two possible estimates of the costs associated with the operation of the BFP in Juma for FAS. The first column (Operational Costs) relates to the expenditures associated with everyday maintenance of the programme such as spending on gasoline, food, office supplies and labour costs related to fieldwork and technical maintenance of the

[34] This does not mean that transaction costs are null, as they exist for the bank. However, this is beyond this study.

programme facilities. However the documentation available to us does not specify if the figures listed also include the actual value of the delivered outcomes, e.g. payroll costs for teaching staff and health agents, and equipment investments. We feel that payroll costs may represent production costs if for example we consider the knowledge delivered by the teacher to the students as a benefit provided under the Social component. Thus we have created a separate column (Production Costs), in which we have included those disbursement lines which in our opinion may include the actual value of delivered outcomes in addition to the direct transaction costs as explained above.

The costs for FAS associated with the operation of the BFP in Juma from April 2008 to December 2009, are estimated to fall between BRL 363,951.84 (roughly USD 182,000) and BRL 228,661.84 (roughly USD 114,000) based on two calculations, i.e. with and without potential production costs (Operational Costs - Production Costs) (see Table 3). (Full reports used for these calculations may be viewed in Appendix II).

Table 3: Costs of maintaining the BFP in the Juma reserve from April 2008 – December 2009

Disbursement	**Operational Costs**	**Production Costs**
Maintenance costs	BRL 112,450.31	
Transportation (land, sea, air)	BRL 27,287.14	
Support to sustainable production activities	BRL 40,985	BRL 40,985
Promotional and advertisement material and events	BRL 19,972	
Carbon dynamics research	BRL 47,525	
Workshops and research materials	BRL 3,795	BRL 3,795
Bank fees	BRL 9,755.64	
Operational Staff	BRL 90,510	BRL 90,510
Food for the operational base in Boa Frente	BRL 1,650	
External audit	BRL 10,021.75	
Total:	BRL 363,951.84	BRL 135,290

Some of the contents for the disbursement lines are as follows: maintenance costs include costs for transportation-related supplies (fuel, lubricants, and technical service), costs for supporting school facilities (computers and school supplies) and costs associated with maintenance of equipment for various fieldwork activities. Transportation costs include air travel and boat tickets for FAS employees, to access the reserves and attend meetings within Brazil. Costs associated with support to sustainable production activities entail costs of equipment and transportation maintenance related to activities organised under the Income component. Operational staff costs include per diem (daily allowance) pay-outs, accommodation and food expenditures, as well as financial support to teachers, health agents, construction workers, and project consultants.

The direct disbursements for the BFP components are not included in this table, as we consider them to be separate from the operational costs, and in addition the financial reports do not make the figures pertaining to this explicit. Additionally, the financial reports do not cover the costs of operating the Deliberative Council (see Section 5.3.3.1). This structure is in the implementation phase and thus costs are unknown to us.

As mentioned in the previous section, we have estimated a fraction of the average monthly payroll and administrative costs which may be attributed to Juma, based on the average numbers related to the entire staff of FAS. We based our calculations on the assumption that 5% of the spending related to the entire organisation can be attributed to BFP in Juma, as stated by the financial and administrative director of FAS (pers. mess. Villares 2009). It was hard to establish a more precise measurement as many employees of FAS are simultaneously involved in multiple projects running in different reserves.

The average monthly payroll costs cover wages, taxes, bonuses, health and life insurance for all FAS employees including administrative staff, as well as pension contributions for the general director of FAS, seminars and internships, and sum up to BRL 23,184.40 (USD 11,500). The average costs associated with travel expenses and fuel, accommodation and fieldwork activities, board meetings, consulting services and external audit come up to BRL 13,325 (USD 6,500) a month. We do not exclude the possibility that some of these costs included in these numbers may overlap with the ones described before, as we were unable to obtain an all-encompassing report which would show organization-wide expenses in relation to Juma.

5.5.1.3 What are the costs of participation for individual households?

In regards to transaction costs on the household level we looked at the costs of participation for the community members in relation to time and money spent for attending various programme activities, such as general meetings and courses, as well as for commuting to town to withdraw the monthly payment. We also attempted to evaluate the participants' own estimate of effort made to be involved in the programme.

Payment collection

We consider the time and money spent to receive the payment as null for the participants of the BFP. Most participants need to travel to town for many other reasons besides receiving the payment, for example for selling their produce at the municipal market, purchasing items for their homes, receiving other salaries and financial support, visiting children who go to school in Novo Aripuanã or seeking medical help at the municipal hospital. Once the participants arrive in Novo Aripuanã, they usually stay in town a few days; some even spend half of their time in town and half in the community, as most people either own a house in Novo Aripuanã, or have some family living there. Thus additional costs for accommodation are not an issue. The trip length to Nova Aripuanã for beneficiaries may differ depending on the location of the community varying from a few hours to a few days of travel. People living on the rivers other than the river Aripuanã for whom it takes a few days to reach the town, choose to collect the payment every 3-4 months.

The cost of gasoline per roundtrip may be as high as BRL 200 (USD 100), thus they prefer to wait for the payment to accumulate in order to help cover the transportation costs. Those living within 2-5 hrs of travel choose to come every one or two months, spending between BRL 30-BRL 80 (USD 15 - USD 40) for gasoline per roundtrip. In addition we learned that families sometimes travel together to the town, thus reducing costs, and those families who live in communities located near the highway AM-174 in Juma also have access to a free municipal bus which transports them into town. We also were informed that if a family could not go to town to withdraw the payment, they often gave their card to neighbours or family making the trip, so they could withdraw the money for them.

The money should be available for withdrawal on the first of every month, though a few respondents have voiced the concern that the payment is not always delivered on time. For

some it presented an issue as they time their trip to Nova Aripuanã specifically to withdraw the cash. We did not verify if the information regarding the delay was true.

Attending courses

The estimate of costs associated with attending courses offered by the programme cannot be analyzed on a general level as only 18 of the respondents in our sample have attended such activities; however involvement in these activities does not seem to be very demanding. None of the respondents have attended more than two courses. Fifteen respondents declared that the courses they attended took only a few hours, while three could not remember the specific schedule as classes were taking place alongside other activities organised by FAS. The locations were strategically selected; as a result none of the interviewed participants had to spend more than four hours commuting one way, which roughly translates into BRL 60-80 in gasoline costs per roundtrip. Only one respondent spent 12 hours travelling both directions as the river was dry and many waterfalls were on his way. One third stated that it took some effort from them to attend these courses. The reasons listed were as follows: hard trip, inconvenient accommodation and given up house and farm work. Most other people have also admitted that they had to give up their daily tasks in order to attend the courses, but did not see it as a sacrifice on their part. We do not have the data pertaining to who covered the cost of gasoline; however we know that it is a common practice of FAS to assist with that or to provide communal transportation for gathering people to participate in such activities.

General meetings

As required by the rules of the BFP, all potential participants of the programme must attend one general meeting. Most of our respondents have fulfilled this condition and only a small fraction chose to attend more than one meeting. The duration of the meeting was usually three days, however not all participants were present the entire session. Food was provided by FAS for all attendants.

About 66 % (63 people) of the respondents said that it took some effort from them to be present at the general meeting (see Figure 25). Some people found it hard to attend such events with children, others, who decided to leave children behind felt concerned the entire time while away from home. In addition, costs of gasoline were not compensated for everyone. Other complaints included issues associated with hard trip and poor organization of

the meeting. Another 29% (28 people) did not agree that the meeting was hard to attend. However overall we did not get a feeling that anyone was extremely displeased with attending the meeting. Even though people expressed certain dissatisfaction, most at the same time admitted that such things have to be done anyway and they were willing to sacrifice their time to obtain new knowledge.

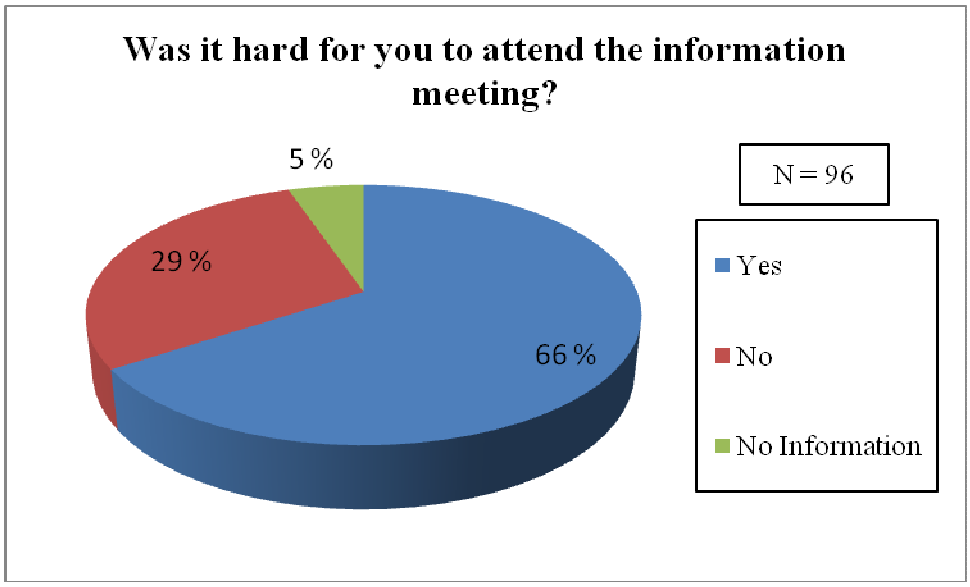

Figure 25: Difficulties of attendending information meetings

(Question 27.1– Was it hard for you to attend the information meeting?)

Even though for some participants attending the meeting caused some inconvenience, it was a one-time event and it should not be considered as major cost of participating in the programme. Other general meetings related to the reserve association are projected to take place every other month starting from 2010 as the reserve association is yet to become an active body, therefore we were unable to collect the necessary data at the time of our visit.

Additional issues

We did not have a specific question regarding the documents necessary to participate in the programme, but during the course of our fieldwork we realised that some people lack the necessary papers and are not benefiting from the Family component. About 60 families are still in the process of collecting the documents, which takes a big effort from them both in terms of time, money and stress. The bureaucratic obstacles in Brazil can make the process of

obtaining personal identification last for years. People complained that every time they go to town, the responsible office is either closed, lacks necessary application forms, or even paper to print ID photos. FAS representatives do not have the means to expedite this process and people are largely left on their own with this issue. It creates frustration not only with the municipal officials, but also with the programme, as many community members seem to have a hard time understanding that this issue is beyond FAS' scope.

5.6 Satisfaction of Participants with the BFP

This section covers issues related to satisfaction of the dwellers of Juma with the BFP. The analysis in this section is based on reviewing individual interviewed communities in Juma, personal observations and also information provided by an informal group discussion.

5.6.1 What is the attitude of the reserve dwellers towards the BFP?

As mention before in this chapter, assessing attitudes is a complex task. However, in seeking to assess what is the attitude of the inhabitants of Juma towards the BFP we have made sub-questions regarding if the residents consider the benefits enough to follow the rules of the BFP, and how satisfied they are with the programme.

5.6.1.1 Do they consider the benefits sufficient enough to follow the rules of the BFP?

We will show if the residents of Juma consider the benefits enough to follow the rules of the BFP. First of all it is important to know how familiar the dwellers of Juma are with the BFP rules. Once we establish this, we need to assess how many of them have in fact made any changes to comply with the rules in order for them to be able to judge if their changes were worth the benefits. Lastly we will establish the number of people who actually receive the benefits.

Over half of the respondents, 56% (54 people) are familiar with the rules, with no deforestation being the most commonly known rule (see Figure 26). Forty people (42%) said they are not familiar with the rules, while two could not answer the question. Most other respondents also knew that fishing and hunting for commercial purposes is not allowed.

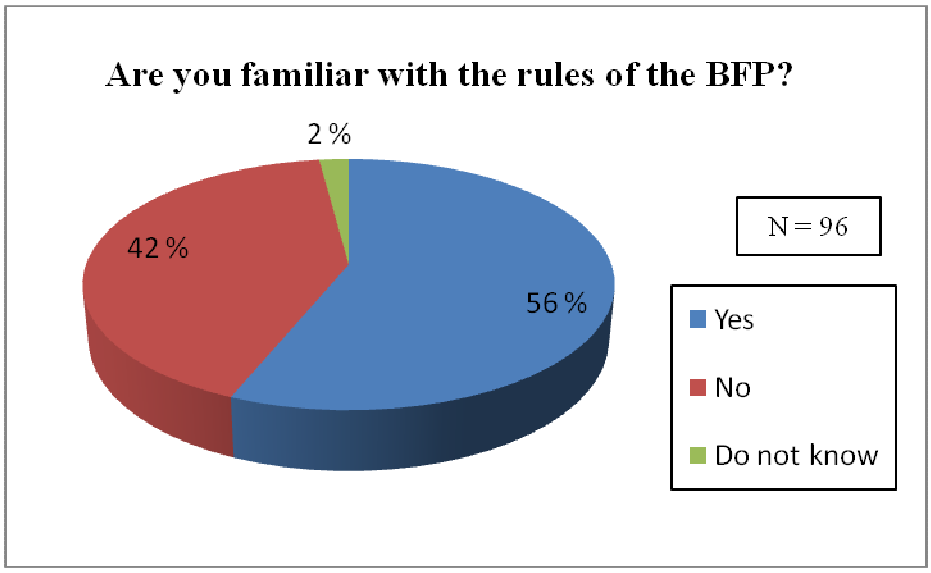

Figure 26: Familiarity with the rules of the BFP

(Question 17 - Are you familiar with the rules of the BFP?)

In our interview we also asked inhabitants of Juma what they think of the rules of the BFP. Most of the households consulted said that the rules of the programme were very good for the environment and beneficial to protect the forest. Nonetheless, they also mention that the BFP rules were good for the environment, but had a negative effect on their income, since the payment is very low and "it is enough to buy almost nothing". Other respondents said that even though the payment is very low, it helps.

When asked about the changes in behaviour and agricultural practices they had to make according to the BFP rules and in order to receive the payment, 33% (32 people) of the respondents reported that it is worth it. However, the same amount of households interviewed reported they did not have to make any changes, while 17% (16 people) of interviewees reported that they did not think the payment level corresponded to the changes they made (see Figure 27). In addition, 32 people said they had not made any changes (33%).

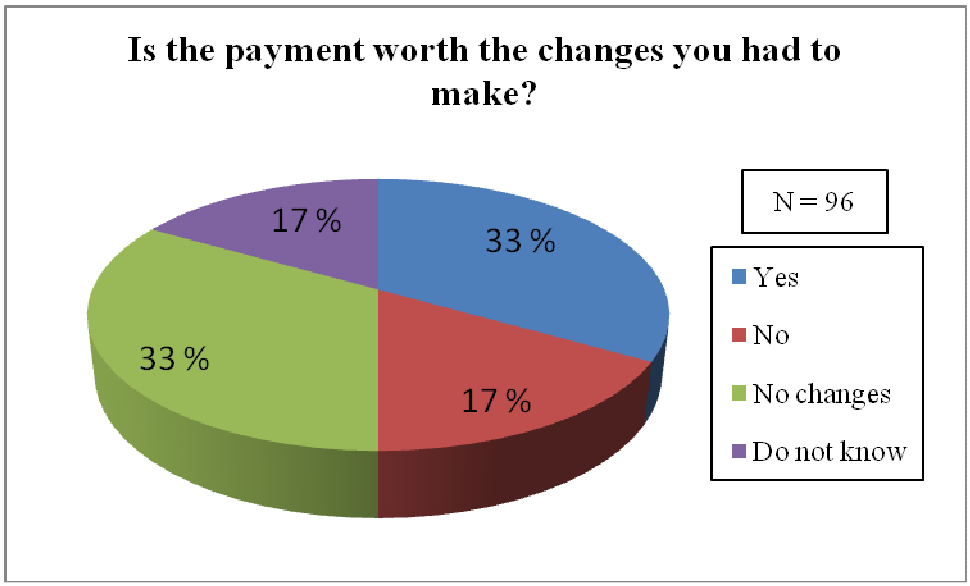

Figure 27: Value of payments in relation to changes that residents had to make to participate in the BFP

(Question 19 - Is the payment worth the changes you had to make?)

However, we had some control questions in our interview, and one of them was related to if residents of Juma have changed cultivating practices or if something was different (tools, hours, methods, use of fertilizer) now compared to before the BFP. Among all the respondents, 75% of the households interviewed informed that there have not been any changes in cultivation methods or other aspects related to agriculture such as size of land, etc; see section 5.4.1 (Figure 7) for further information. The findings show that even though most of the people that live in Juma have not changed their agricultural practices or behaviour, 18% of households reported that the payment is not worth the changes they had to make in order to receive the payments. What calls our attention is that in fact most of them have not changed much in relation to cultivation methods, and thus asking if the payment is worth the changes is redundant.

Looking to evaluate how satisfied residents of Juma are with the payment, we attempted to establish how many households were actually receiving the payments. Among the interviewees, 91% (87 people) were receiving the Family payment. The remaining respondents were mostly waiting for the debit card or confirmation from FAS, or had issues with identification papers. Additional findings show that even though residents are not satisfied that the payment level is not higher, and it may not cover the supposed changes they had to make, they think that the rules are good for the environment and also for them and

because of that they have accepted to follow the BFP rules. Yet it is difficult to measure satisfaction since the programme is still relatively new. In addition, the individual payment that the BFP provides to the residents of Juma may be seen as a bonus for them since they are obligated to follow the reserve rules anyway.

In relation to the non-monetary, collective benefits that the BFP provides to the dwellers of Juma, we wanted to assess what kind of value they were receiving so far from the programme, and if they considered these benefits enough to follow the rules. Due to the recent implementation of the BFP and the components that will provide the non-monetary benefits, 80% of the respondents reported not receiving any non-monetary benefits. The most widespread non-monetary benefit among the 20% that reported receiving them, was education (67%), followed by health (17%) and new income opportunities (4%) (see Figure 20, in section 5.4.4.2).

Based on these results, it is difficult to estimate satisfaction of a programme that is not fully implemented and where the benefits have not reached all the communities. We recognised that the BFP is not fully executed yet, but it is relevant to observe how residents do not see all the benefits that the programme may give to them in the future, which can be explained by poor communication and information from FAS, as mentioned before. The BFP is a promising project for local residents of Juma, yet many of them said that progress is slow.

5.6.1.2 How satisfied are they with the programme?

The question concerning if the residents are satisfied with the BFP required us to assess attitudes of the reserve inhabitants. During our field work and the process of interviewing the residents of Juma we could generally observe a positive attitude towards the BFP and towards the people that work within the programme. The first impression that we got is that members of the local communities have a good relation with FAS and are positive towards the BFP.

Among the respondents in the sample, 49% (47 people) and 8% (8 people) reported they were satisfied and very satisfied, respectively (see Figure 28). Thirty-five percent (33 people) said they are more or less satisfied with the programme, while six percent (6 people) said they were not satisfied. Two did not know. A large percentage mentioned that the payment was not enough and should be increased. It came to our attention however, that many residents are expecting the payments to increase, as they do not seem to fully understand the dynamics of

the BFP and the value of the other components, and it should be better explained to them that neither the BFP nor FAS have the possibility to provide a substantial income. This is in any case the responsibility of the state.

This again demonstrates the confusion in the reserve as to who is responsible for what between FAS and the Amazon State. It also reveals problems with communication between FAS and the Juma residents, as the residents cannot be blamed for confusing things since they have received a large amount of new information in a relatively short time. Due to the fact that there is a cultural difference which can be an obstacle to education and communication, FAS should show more understanding about this issue, giving local people more time to absorb and comprehend all the new information. The issue of whether these issues will pose a future problem for FAS and the implementation and maintenance of the BFP in Juma is not clear to us, as this would require further study and observation on the development of the programme and of the improvements that the communities eventually experience.

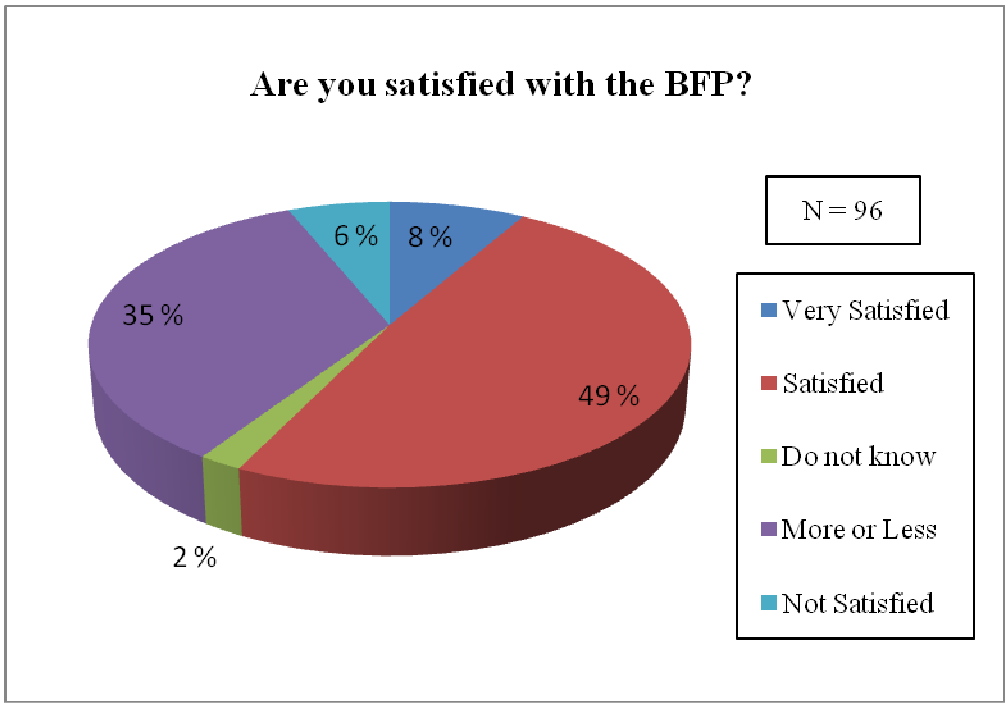

Figure 28: Level of satisfaction of the residents with the BFP

(Question 42 - Are you satisfied with the BFP?)

It is also of importance to observe how the payment is perceived. Some FAS personnel advocate that it is a compensation for reduced livelihood possibilities, while some others within the organisation see the payment as recognition of the residents' role in protecting their resources. However, it is not perceived as either by the residents of Juma, as they do not seem to understand the exact reason for receiving the payment from FAS. In fact, they see the Family component as a payment that is independent of the role they play protecting the forest. FAS have not been able to explain to local people that the payment is not intended to replace income strategies, and that it is not a salary or a payment they are receiving for changing behaviour or traditional agricultural practices. The payment is just an acknowledgment given to local people for performing environmental conservation, however it has not been introduced as such or at least dwellers of Juma have not understood that. The introduction of the payment scheme in Juma may produce negative consequences in the long term, since the residents of Juma think that the payment given by the BFP is not enough, or is too little and should be increased.

To have another picture of the level of satisfaction, we tried to establish if there is a relationship between the level of satisfaction with the programme and various factors that in our opinion could have an effect on it. We chose to look at the level of satisfaction (which was rated by the respondents on the scale from 1 to 5, 1 being the lowest and 5 being the highest) versus the following independent variables: distance to Boa Frente, monthly cash income from sale of agriculture and forest products, monthly household expenditure, size of household, age of respondent, and years of school completed. Overall, the multivariate regression model did not reveal a strong relationship between the dependent variable and the independent ones, with R square of 0.24 and adjusted R square of 0.18 (please see Appendix IV).

We expected to see a negative correlation between the level of satisfaction and remoteness of the community in question from Boa Frente. However, no significant relationship was revealed. The variable that showed a significant relationship was monthly cash income from sales. The model revealed that the level of satisfaction increased with higher levels of income. We can assume that those respondents with the lower income levels are less satisfied, as they may have higher expectations that the programme will increase their financial well-being. This is consistent with our findings discussed below (see Figure 30) where a large fraction of respondents expressed their hope for increased payments. Another variable which came close to being significantly related to the level of satisfaction is age of the respondents. The model

revealed that the older the respondents are, the more satisfied they are with the BFP. We cannot relate this to any factors known to us, as in our view there are no elements in the programme benefits that cater especially to the needs of the elderly.

Aiming to find more answers related to dwellers satisfaction of Juma with the BFP we asked if the programme was helping their families (see Figure 29). Ninety-two percent (88 people) confirmed that the BFP helps their families, yet many expect more help, especially from the government, and have high expectations that the BFP will cover their needs. Five percent (5 people) said the BFP does not help, while three could not answer. Nonetheless, 54 respondents (among those 35 who think the payment should be increased) have identified the payment as additional help to their family when asked about the impact the programme has in their life, and 84 respondents have admitted that the payment helps when asked specifically about the effect of the Family component as opposed to the entire programme in general.

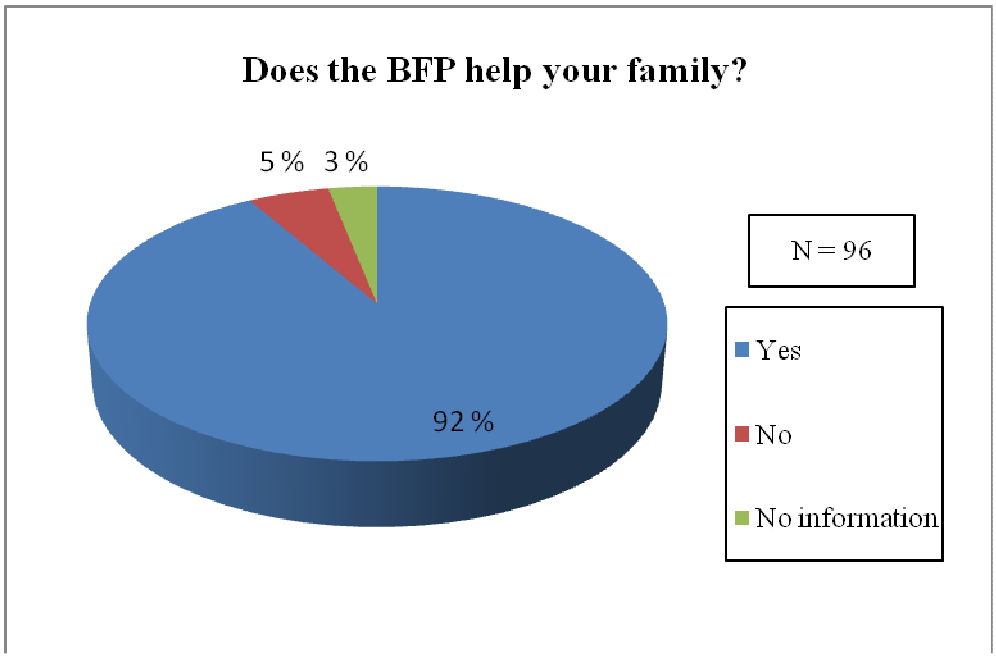

Figure 29: Does the BFP help the households in Juma?

(Question 44 - Does the BFP help your family?)

Out of 105 answers from the 96 respondents, 57% (60 answers) reported that the payment should be increased (see Figure 30). Out of these 105 answers, 14 (13%) respondents said

they did not know what should be improved, while 13 (12%) mentioned an increase in other benefits, and eight (8%) thought nothing needed improving. Another four (4%) mentioned more job creation and business opportunities, three (3%) wanted improved communication levels between FAS and the communities, and three (3%) mentioned other options.

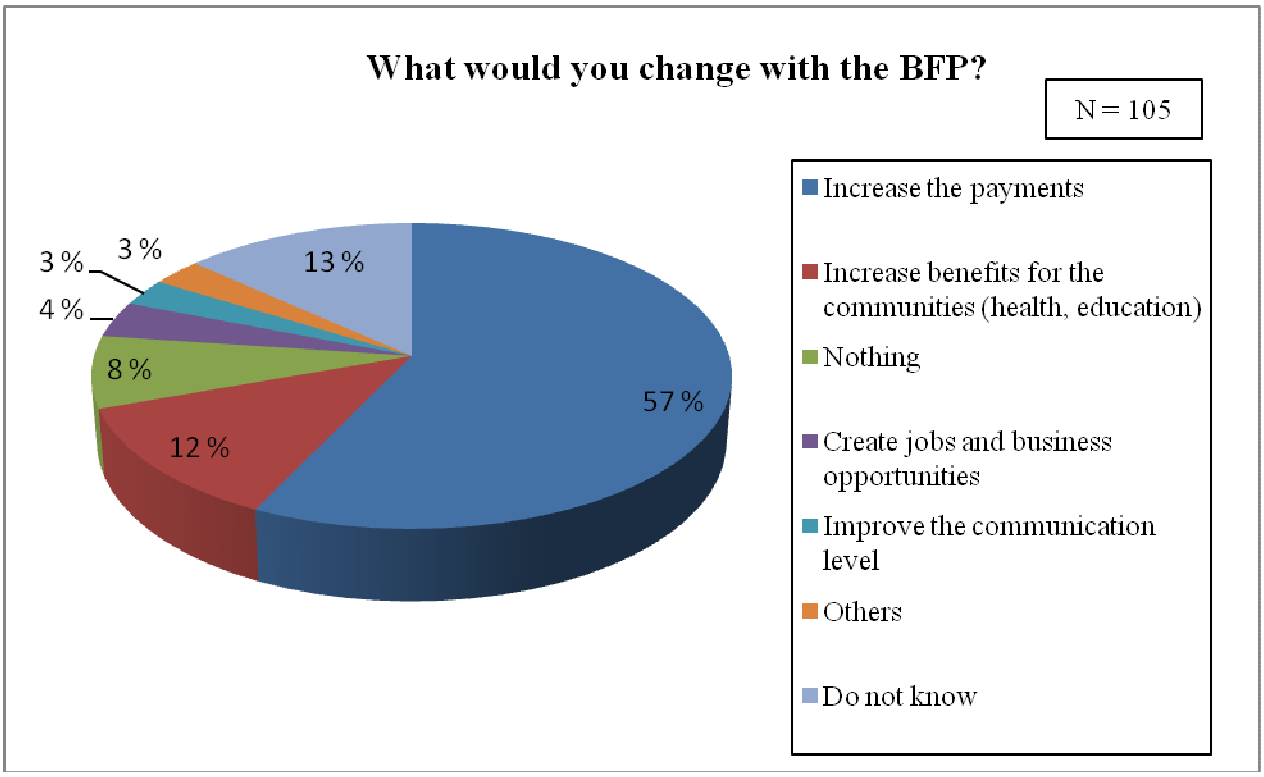

Figure 30: Preferred changes in the BFP by the residents

(Question 45 – What would you change with the BFP?)

Among those who wanted increased payments, twenty-two would be satisfied with BRL 100-150, while 11 expected it to be at the level of the minimum wage – around BRL 450, with the rest falling in between or being unable to name a specific amount. Others mentioned that a minimum wage would be "fair" because in this way people would not clear the forest to get extra income, and it would compensate all the changes they have made. Such a high fraction of respondents wanting more money may be explained by the fact that currently not all participants understand the full scope of the BFP and the other components which are yet to arrive. These are most likely to have a positive effect on the residents' livelihood security, yet they currently expect the payment to be the sole financial support. In addition, some few

respondents who previously had a high level of income before the creation of the reserve from logging and commercial hunting and fishing, stated that although they support the reserve and the protection it offers and appreciate the BFP and seem sincere about their acceptance of the programme, they are waiting for more support in terms of social and financial help and employment opportunities. Their level of satisfaction seems to be more related to the degree their expectations are met, rather than with the actual workings of the programme.

On the other hand, very few people mentioned that the BFP had brought anything negative to their community. Our survey reveals that 98% (94 people) of the households consider that the BFP has not brought any negative consequences to the communities in Juma. The BFP is regarded by the interviewees as good project.

Summing up, we asked about any expectations that local people had in relation to the future of the BFP. The answers were as well very positive and there is an optimistic attitude among the households interviewed towards the programme. Many of the respondents expect the programme to improve in the future, and they hoped it could have a positive effect on life for all the people that live in the community, and that the resources would be protected for future generations. We also asked how the BFP had affected social interaction among the communities, and only one person reported that it had made things worse, since the residents now had the possibility to monitor and report each other, and this respondent did not like being held responsible by his neighbours. The rest of the respondents said that community relations had either improved (33 out of 96), or had remained the same (58 people). In relation to social interaction, it seems that the BFP activities encourage interaction and are often an opportunity to exchange information and strengthen their sense of community and belonging. Many of those who said relations had improved cited better communication among residents and better conditions as a reason for their answer. It was also mentioned that the residents felt they now have more contact with the outside world, and this has made them feel more appreciated.

The general attitudes of the residents of Juma towards the programme as a whole are still positive, even though there have been problems related to the communication and inclusion of local people in the designing of the BFP. Another issue is that the implementation of the components of the programme is perceived as very slow by the residents, and people have started to ask what is happening with all the promises made by FAS, who must now

concentrate on improving the level of communication with local people and strengthening education and communication channels within Juma.

Chapter 6 Discussion

6.1 The Reserve and the BFP

The fact that the reserve was created so close in time to the implementation of the BFP, and that it was largely formulated by the same people that are behind the BFP, makes the effects of either quite difficult to separate. In addition, certain aspects of the reserve, such as organisation, borders, rules and transaction costs, have a large influence on the maintenance of the BFP.

First, there is the issue of organising and administration. The reserve boundaries delimit the BFP, by establishing clear borders for where jurisdiction lies. The reserve has thus resolved the issue of targeting for the BFP, as the programme operates within the same areas. In addition, transaction costs have thus been reduced, as the creation of the reserve called for a detailed study of the living environment and socio-economic factors of the communities, which could have been very costly if FAS were to perform it themselves. Besides, FAS do not take on any responsibility in the line of monitoring and controlling that rules are followed. This latter issue most likely saves FAS very high maintenance costs, as the reserve is so difficult to access and so many communities are isolated and far away from the town centre. The reserve also resolved the problem of land title issues, such as future land claims, except for a few private plots which are currently in the process of demarcation, and that do not have implications for running the programme. The creation of the reserve also made the actors involved equal in terms of who can qualify for benefits, by removing the possibility to compete for influence based on land titles, which could affect economic weight and power balance among the residents.

The creation of the reserve can be seen as a way to defend the interests of those residents, who previously could not stand up against outsiders that took advantage of the forest and its products, although the residents do only have de facto user rights of the reserve. One can then ask why people would work to protect something that is not theirs, but the reserve grants them safety from outsiders, who used to represent the real deforestation threat. One could assume that this can encourage a change in behaviour and norms towards more environmentally friendly action.

The next issue of importance concerns the rules of the reserve and the BFP. They are very similar, and since the reserve was created before the BFP, it looks like the programme has adopted many of the same rules that the reserve has. This would of course make the introduction of the BFP much easier among the communities – the less new rules the residents must deal with, the better. The rules of the reserve are in addition legally grounded and thus work preventative, as violators of the rules risk punishment in the form of fines or jail sentences.

The BFP provides development, a payment and other benefits that can make the changes seem worthwhile and induce less conflict concerning the introduction of the rules. The BFP also encourages monitoring and control, by emphasising that those who are best positioned to monitor resources and the forest are the residents themselves. In this sense, it is of our opinion that the reserve and the BFP reinforce each other, and together have stronger effect on behaviour, attitudes and motivation. Our fieldwork did show that the reserve has a more direct effect on deforestation, by directly prohibiting it. The effect of the BFP is difficult to estimate, due to its recent implementation, but we do think the programme will have a stronger and more long-lasting effect on behaviour and motivation than a purely rule-based initiative such as the reserve which does not provide any benefits beyond land security. The BFP is also more focused on long-term changes within the communities, by providing benefits such as education, altering livelihood strategies and targeting attitudes, than prohibiting and controlling behaviour. The BFP should make adherence to the reserve rules easier, as the residents are provided with alternatives to previous income activities, and supplied with more information that creates new opportunities. This should make the rules that are laid down by the reserve more easy to uphold and internalise.

Continuing with the fact that the reserve creates a legal basis for the rules of the BFP, one could also say something about the effect of this on behaviour and motivation. We can assume that the rationality behind deforestation is largely based on individual needs and interests, as it is our understanding that the residents of Juma previously logged when they were in need of cash income to buy food, pay for medical bills, etc. One could say that motivation for actions that result in deforestation is drastically reduced when punishment became a possible result of this behaviour, especially considering that the pay was not so high

and they now risk being sent to jail and leaving their families to fend for themselves. This could probably outweigh any future gains that they can receive from logging.

Lastly, it is important to mention that based on the reserve, and the similarities between the rules of the reserve and the BFP, one could see the payment component of the BFP as purely a benefit for the residents, as they are required by law to change their behaviour and not guaranteed any form of compensation.

6.2 Participation and Communication

In the theory chapter, participation is a central condition that needs to be addressed if an institutional change is going to be implemented successfully. Assessing local perceptions and needs about specific issues can contribute to designing efficient and effective policies aiming to manage a resource or solve and coordinate conflicts. It can also increase the level of legitimacy of governance structures.

6.2.1 Participation in Setting up the Programme

In relation to our case study, we can observe that since the very beginning of the design of the BFP local people were not fully involved. We acknowledge that consulting all of the residents of the Juma reserve is a difficult task due to time, economic and physical constrains. Different organisations were consulted during the process of design of the BFP, however not all local people in Juma feel represented by them; therefore we can say that there was a disproportionate stakeholder participation. At the same time local communities have been neglected by public policies and now they have a trust issue with the state (pers. mess. Netto 2009).

Observing how the programme has been developed from the initial phase, we detect a rather top down approach, and that local people were involved in the programme in a very passive and instrumental way. However in the operation of the programme, some individuals among the communities hold key positions in relation to providing information about local dynamics and situations for FAS, and also spread information among the other residents. Additionally,

FAS did present the programme to the residents, giving them the opportunity to form an opinion and give feedback. This leads us to believe that FAS do not utilise an entirely top-down, but rather a professional-guided approach to participation. However, it must be noted that both of these approaches involve an imposed external structure. This is not necessarily negative, as if FAS had not taken the initiative to develop the BFP the residents would not have the possibility to benefit from the improvements that the programme offers. The urgency related to implementing environmental governance structures does not always allow waiting for local populations to address the issue on their own.

There is also the issue of how one asks a person who has no education how they want development within their communities. As FAS do not intend to pay residents for any loss of income, or make payments something that can replace traditional livelihoods, in which ways could the residents be consulted? One could easily assume that they would have asked for a much higher level of payment, if they are using individual rationality and only seek to improve conditions for themselves. If people are asked how much they want, knowing that they will ask for a lot and that FAS do not have the means to cover this request, could result in low interest in participating in the BFP, as it immediately does not fulfil their wishes. This especially holds true if the residents are not aware of the potential of the other non-monetary benefits of the programme.

The BFP is targeting all of the dwellers of Juma residing in the area for at least two years, and all of the families are eligible to receive the same amount of payment and the same non-monetary benefits. In this regard equity is not an issue. However, we can observe that since the BFP has not been fully implemented, it currently results in inequity issues. At the time of our fieldwork we witnessed that there was a focus on one community, Boa Frente. In this community FAS have their operational base and is also the place where a lot of politicians and other involved actors such as researchers and journalists are staying when visiting the Juma reserve. The investments that FAS have made in this community have led to inequality among the communities.

If residents of Juma had been taken into consideration when designing all of the components of the programme, we can say that the distributional effects of the BFP components would more likely to be evenly spread out since they are the ones who know what they need. Nonetheless, we acknowledge that it is almost impossible to build a health station and a

school in each community in Juma since many of them have very few residents and in addition to that there are economic, time and environmental constrains. FAS have plans to provide benefits to all communities, enabling all residents to benefit from improvements, and the fact that this has not yet happened has everything to do with that implementation of projects usually occurs in stages, and simultaneous implementation throughout the entire project area is problematic due to costs, time constraints, planning, resources for implementation, and also the distances that represent a challenge.

6.2.2 Participation in the Programme

Another issue that could contribute to inequality is the Family payment, although the payment format and level does not create this issue, as all households are targeted equally. The fact that some residents do not receive the payment, and thus could feel neglected or left out of the programme is not related to FAS or the BFP, but to problems of bureaucratic inefficiency in the state. We found out that many residents of Juma are not yet receiving the payment because they lack documents. We talked with only nine of them and they expressed to us that they felt left out by the programme since they really wanted to participate and receive the payment, but they could not do so.

In relation to the payment scheme, as already mentioned, conversations with FAS employees revealed that the payment was not based on opportunity costs, and was used more as a "hook" to attract people to participate and join the programme. This type of participation could be described as conditioned, although the effect may still be positive. However, the level of participation in the programme may be reduced if people stop receiving the payment, or if they are not satisfied with it. We understand that FAS wanted to establish a trust relation among the residents of Juma by providing a regular benefit, but once one starts with a payment to encourage participation that is not based on opportunity costs or is not the product of the effort or the job of local the people, it may lead to rent seeking behaviour. Will local participation and engagement be the same? We cannot answer this question, but we foresee that it may represent a problem in the future. We could say that using payments to attain participation is not sustainable, and even more so in the case of the BFP, since it is a project that depends heavily on donors to run.

The degree of voluntary participation is also a very interesting point that we would like to address. Local participation in the BFP is voluntary, and no one can force anybody in Juma to be a part of it. However, if we look at it from the point of view of local people, we cannot say that the BFP is totally voluntary since they cannot stop, alter, or oppose the BFP implementation in their communities, since this is an in part a state supported programme that is aiming to protect the environment, improve and develop the lives of local people in Juma. Even though they are affected by the implementation of the BFP in Juma in one way or another, they cannot do anything about it. The remaining issue here is that the community payments are often based on how many receive family payments, and hence participation will affect the ability to buy new equipment or build new infrastructure. If participation becomes a social pressure issue, the freedom to decide whether one wants to participate becomes challenged. However it would be fair to note that at the moment of our fieldwork we did not find anyone that did not want the programme in their communities.

Participation among residents of Juma in the diverse activities that the BFP offer can also be influenced by the level of transaction costs. Nonetheless, we could observe that FAS were trying to cover some costs related to the transportation expenditures among the local people to promote more participation. In many situations we were informed by locals that FAS were helping by providing gasoline to local people, in this way the participation was facilitated for the residents. However, not all of them received this support.

6.2.3 Information and Communication

In relation to information and communication opportunities, we see that the BFP is providing a link to the society beyond the reserve borders for the local people. Now with the presence of the BFP in local communities, people can have access to information about environmental protection, climate change and how to improve their agriculture practices. Respondents seem to be more aware about deforestation issues, and since the BFP programme was implemented it has opened an opportunity to local people to discuss these issues. We have been told by residents of Juma in informal conversations that the existence of the reserve without the presence of the BFP will not be enough to guarantee the protection of the forest and to monitor illegal activities. The BFP plays a very important role in providing a channel to communicate with the state authorities and also to express their needs and concerns.

Dissemination of the information is an issue that we feel is problematic, as many residents had problems articulating what had been learned in the information meeting. It seems that FAS have introduced a lot of information in a very short period of time, which has resulted in confusion among the residents. It can seem that a pure academic approach does not work in the area and that people must understand what is explained, otherwise they will forget everything the next day and all of the organisational effort will be lost. Nonetheless, with the information that residents of Juma are getting from local meetings, they may feel more empowered to protect their forest.

In relation to this, FAS have to acknowledge that there is a cultural boundary between external actors and the local society in Juma. Words, meanings, priorities and way of seeing diverse issues are not the same, so FAS should improve their communication channels, or maybe even slow down the process of implementation of the BFP. However this latter point may delay the results from receiving the benefits provided by the Social, Income and Association components. In addition, this is against one of FAS' aspirations which is to fully implement the programme and achieve recognition of the project in order to secure results and further financial support from the donors.

The BFP has also improved the mobilization of local people, it has facilitated the exchange of ideas among local dwellers and the level of communication has increased in general among the communities. The BFP also encourages development of local organisations, as in some communities they did not have presidents or a community setting where they could discuss important issues.

6.3 Norms and the Effects of the Programme on Attitudes, Motivation, and Behaviour

The question of norms which could potentially shape the behaviour of the reserve dwellers towards the forest was of central interest in this study. We tried to asses any potential impacts that monetary and non-monetary benefits could have on attitudes, motivation, and behaviour.

6.3.1 Norms

The actions of the residents were for the most part not conflicting with environmental protection. But based on our observations, personal interviews and discussions with the representatives of FAS, we could not identify strong, pre-existing norms of protection among the reserve residents. For example, as mentioned before, large-scale logging was not a threat from the local residents, most likely due to lack of capacity to clear the forest. However we cannot be sure that this is not in part related to norms of protection. In relation to harvesting of some forest products, overexploitation could be observed. This could possibly reveal, that given the capacity, the residents would overharvest if the consequences of such actions are not clearly understood.

The issue of absence of explicitly formulated norms is most likely linked to the social conditions within the communities. Lack of awareness and scientific knowledge often results in situations where people cause damage to the environment not because they lack norms as such, but because they are simply unaware of the negative consequences their actions may have, as in cases of disposing waste in the rivers. Once the link between the actions and negative consequences had been explained, most stop doing these actions[35]. This may indicate that there are no strong norms which would condition people against changing their practices, at least when it comes to minor changes like garbage disposal. We understand that changing people's norms in relation to giving up profitable illegal activities or resisting illegal logging is of course more complicated.

Our respondents have clearly demonstrated the understanding of their dependency on the forest resources and the desire to preserve the forest for the communities and future generations. This may suggest that a good foundation exists for introducing new norms, or rather shaping the positive attitude towards the forest into a more defined understanding.

[35] This corresponds to the Norm Activation theory formulated by Shalom Schwartz in 1977, which is often applied in order to predict pro-environmental behaviour. The theory proposes that with awareness of consequences and ascription of responsibility, the norm is formed and activated once the situation presents itself. It can be applied to the case of the BFP as environmental education can make residents aware of the negative consequences of certain behaviour as well as positive results from desired behaviour. By showing the residents how they are responsible for their actions and that change in behaviour is necessary, the programme may help forming pro-environmental norms and triggering the desired response to a given situation. However, awareness alone is not sufficient for taking action and it is necessary that the individual must have the confidence that the action is within their power and will achieve the desired outcome (Biel 2007; Jackson 2005).

Reshaping the understanding of the environment into a concept of environmental protection will nonetheless require a big effort from the programme managers. As FAS representatives explained, the way the forest dwellers perceive their world is strongly rooted in what they can sense and envision. Their knowledge of the surrounding environment is embedded in routine practices and as we have been explained, they know only what is immediate to their survival, while issues going beyond the direct effects on their livelihoods are not recognized. This is why abstract concepts, such as global deforestation threat and climate change which cannot be directly observed and related to the everyday life, are hard to cater[36].

Taking this dynamics into consideration, the designers of the programme are trying to find the best way of introducing the concepts promoted by the BFP agenda. In its efforts to educate the forest dwellers about the norms of protection, FAS link the concept of environmental conservation to religion. For example, FAS argue that believing in god is a norm among the forest communities, and the understanding that god created all living beings and acts as their guardian relates to the idea that destroying the environment is prejudicial. This approach helps minimizing the risk of rejecting new norms. In addition, most reserve dwellers lack technical capacity to deforest large areas, which also should facilitate the introduction of new norms, as they will not clash with the existing lifestyle. However we feel that there is a big gap between not rejecting the norms and actually accepting them. Turning this so to say passive positive attitude into an active involvement and perception of oneself as a guardian will require a lot of time.

One may look for signs of new norm creation tracing changes in attitudes and behaviour. At this point it is hard to differentiate between the change in attitudes and change in behaviour. The change in attitudes may require a long time to emerge, while it will not necessarily translate into real actions. At the same time changes in behaviour do not prove that a shift in attitudes has been achieved, as they may simply be an outcome of obeying the rules out of fear. Changing attitudes is an internal process based on acceptance of new norms, while changing behaviour could also be a result of external forces. Indeed, based on the answers received during the individual interviews, we may presume that many people have just accepted that rules are in place and must be followed without trying to understand why. The BFP must convince the participants that changing their behaviour is worth the effort, and thus internalise new norms, and not just act out of economic profit or other individual interests.

[36] FAS provides explanations regarding global climate issues to the residents in an attempt to make them more aware of the importance of their actions, as giving a broader understanding of their role in environmental protection may make them more inclined to change attitudes and behaviour.

In relation to internalizing the new capacity of forest guardians, some people have already expressed satisfaction that now they are backed up by the law in their efforts to fight illegal invaders, although this role is not explicitly recognised yet. But the question is how strong the norms should be in order for people to act as guardians knowing that it may cost them their own life or endanger their family members? This will largely depend on the work the government organisations responsible for monitoring and control will do on their side. This issue will be further discussed in section 6.4.

Even though our findings show that the programme had changed the respondents' attitude towards the environment, we were not able to capture to what degree this was true as most explanations simply stated that now the respondents are more aware of the importance of the forest without giving any specific examples of how this is so. Many respondents gave us an impression that they were simply repeating what was said to them during the information meetings without fully understanding the words. However we are not able to confirm this, as there could be various explanations for this.

First, they may have really gained a new understanding which they did not have before. Second, as discussed in section 5.4.2.2, the residents of the reserve are for the most part living in harmony with their environment, using their practical experience and day-to-day observations in order to subsist in the given conditions. Thus we may be searching for shifts in attitude where it is not necessary, as norms of protection are present but in a different form. Second, the understanding which has always been there has acquired a new meaning, described by the words of FAS. The reserve dwellers may realise now that their practices which did not have a definition before are indeed environmentally friendly, and it gives them a new vision of their capacity. Lastly, it is of course possible that the respondents answered without understanding the question or gave us an answer which they believed we wanted to hear. A certain general pressure to demonstrate that they are following the rules may exist among the participants of the BFP, hence the desire to show that they understand the importance of the forest protection. In addition the language we used may have been too different to the respondents in terms of formulating our questions, even though we tried our best to keep them simple, while conveying the essence of the issue.

Overall in the case of Juma it is difficult to identify whether there have been any changes in attitudes or behaviour. The more specific rules pertaining to zoning of agro-extractivist activities were in their design stage at the moment of our fieldwork and were not yet known to

the Juma residents. Obeying these rules may require more effort from the reserve dwellers. Thus one may expect a negative shift in attitudes towards environmental protection since the last will require much more input from the participants.

Currently we may only talk about the readiness of the programme participants to follow the rules. They seem to understand that they have to do their part at the same time expecting to see more progress in the programme development. The attitude towards the programme is generally positive. While on one hand the rules may be associated with undesired restrictions though they do not necessarily affect the participants directly, on the other hand there is a realization that the programme and the reserve come with the rules. As both are seen as a benefit - the reserve in particular, as it already gave people more land security - it is unlikely that the norms of environmentally friendly behaviour, which the joint rules of the reserve and the BFP hope to introduce or stimulate, would be conflicted. Nevertheless it will require a lot of time and effort to internalize them. This is particularly true when new norms are supposed to provoke a certain behaviour which may put the actor in danger (i.e. fighting illegal loggers).

6.3.2 The Effects of Payments on Attitudes, Motivation and Behaviour

As mentioned in the theory chapter, using money in order to promote certain outcomes - in our case environmental protection and active involvement in reserve management - may have various implications depending on the payment level, format and discourse chosen in order to introduce the payment, as well as various characteristics of livelihoods benefiting from the payment. So far we cannot see any real impacts on behaviour; however the impact on motivation may be of bigger concern in case of Juma, where more active participation from the beneficiaries is expected in the years to come in order to achieve the aims of the programme. We looked at how the payment may affect motivation to participate and deliver results based on the impacts the monthly BRL 50 have on income, labour and livelihood security taking into consideration potential side effects, as well as the way the payment is perceived by the participants.

As we found out, the payment level established by the designers of the programme was not based on the opportunity costs of giving up certain activities. However, we also realised that

only a mere fraction of our sample used to make a living from the activities now banned by the programme rules. Some respondents have expressed their concern in relation to limits on plantation size and use of fire, however while questioning further into such issues, we realised that these concerns were mostly precautious, since at that moment many of those who complained about the restrictions were not affected by them. However, the new zoning rules may entail new costs for the residents, but since these rules are still in the implementation phase, we cannot fully establish whether the payment amount is higher or lower than what it should be according to the payment calculation method based on the opportunity costs. Thus we cannot judge on the effect the payment has in the scope of potential loss of income due to change in practices related to shifting harvesting areas as required by the zoning rules.
Looking at the payment amount in proportion to the monthly income from sales, we observe that more than half of the respondents (72%) have less than BRL 200 monthly in cash income from sales of agricultural and forest products (see Figure 6). Thus for the bigger part of our sample, the monthly payment equals at least one quarter of the cash income earned by labour. This may be perceived as a relatively large fraction. On the other hand, in comparison to total income including subsistence production, the payment only represents between 10 to 15% increase, and thus the monthly addition of BRL 50 to a family budget cannot really shift the recipients' welfare to the next level. This was the respondents' main concern as well, as most of them commented that the payment should be increased and that this money does help, but not significantly.

As discussed in section 5.4.1.3, the payment is too low to allow for hiring additional labour and increasing volumes of production, especially in agro-extractivist activities, where no limits on how much can be collected exist. No clear conclusions can be made in relation to the payment enabling recipients maintain the same lifestyle while producing less for sale. Only seven respondents did report that their level of production has decreased comparing to the years prior to the BFP. However the reasons behind this change cannot be clearly attributed to the effect of the payment. In addition, among six respondents who have stated that they have smaller plantations, the majority still demonstrated higher revenues from sales comparing to what they used to be when the plantations were bigger.

Further, it was hard to establish whether the volume produced for sale vs. for consumption remained the same compared to the volumes produced prior to the BFP, as most respondents had a hard time remembering how much they used to grow and sell in previous years, usually

stating that the volume remained unchanged. The understanding of the variations in income and volumes produced were additionally complicated by the fact that the price levels for the main good – the manioc flour – have increased considerably in the municipality of Novo Aripuanã due to crop failures in other regions. Thus we were not able to differentiate between the effect of the payment and the effect of the increased price levels. We can only assume that a certain risk may arise that the payment will not be perceived as something valuable if the present price dynamics prevails in the future and creates a situation where the appreciation of the additional cash income the payment provides is undermined by the high revenues from sales for those who produce large volumes for sale, which does not include the lowest cash income from sale group as mentioned in section 5.2.3. As this group includes people who do not produce for sale, the payment could have a different effect on them and could be perceived as more important.

FAS on the other hand state that the payment will not be increased even if the availability of funds allowed for such a measure. Turning the payment into the main source of income would be especially precarious since many participants currently appear to receive the payment without having to make any real changes in their practices. It is important to make sure the participants do not become fully dependent on the payment, and at the same time do not capture the meaning behind it, while the programme components are not going full-scale and new knowledge and understanding of the environmental issues that the residents face are not yet fully conceived. Otherwise it is possible that little potential will be left for attracting interest to the programme in the future, as participants would already be satisfied with just receiving the money. Indeed, our respondents have demonstrated the misunderstanding that the payment is "another benefit from the government", while the other components of the programme are perceived as a separate entity.

We observe that the payment does attract interest to the programme, even though the relationship between the components is not yet fully understood among the reserve dwellers. In addition, the amount is not large enough to discourage people from getting involved in the BFP activities aimed at improving their livelihood security; BRL 50 can hardly demoralize the recipients to the degree that they would cease all productive activities and base their livelihood security on the payment alone. The payment is not low to the degree that it would go unnoticed in the family budget. It does help buy gasoline, food or supplies for children and the respondents are clearly aware of that (see section 5.4.4.1). Also, the money is paid on the

monthly basis, which creates a sense of trust, security, and permanence. Such format keeps the recipients involved and reminds them of the existence of the programme on the regular basis. Thus it is possible to conclude that the established payment level and format are suitable in the context of the BFP in Juma.

As only three respondents among our sample named the payment as the reason behind conforming to the rule against deforestation; one could jump to the conclusion that the payment is not effective. However it is possible to argue that it is good for attracting attention to the programme in general and the pay-offs may be hard to overestimate if the Family component keeps on functioning as a hook to ensure continuous participation and further internalization of the new knowledge promoted by the BFP.

As discussed in section 3.1.5 and 3.3.6, payments may affect motivation in various ways. Crowding out the desired behaviour if the beneficiaries perceive the monetary incentive as morally inappropriate in relation to the services provided is very unlikely in case of Juma. If people do not see it ethically wrong to cut trees, they should hardly be insulted when offered cash for protecting the forest. Again, the income level is low and people seek various ways of getting extra cash. According to FAS representatives as well as some personal confessions, it is still common among the reserve dwellers to harvest timber for sale when cash is urgently needed in case of family emergencies (section 5.4.1.1).

The payments can establish a reciprocal relationship when beneficiaries demonstrate desired actions in proportion to the offer received. This is not an issue in Juma so far, since the payment is just an extra income to the residents of Juma, since they have to follow the reserve rules regardless of the participation in the programme.

FAS present the payment as an acknowledgement to the forest communities which had been left unnoticed by the government and whose role in forest protection was underappreciated. This may have an important effect not only on behaviour, but also on motivation, which is a central issue since one of the goals of the BFP is to keep reserve dwellers actively involved in monitoring of the illegal activities both among the programme participants and outsiders.
However, in order to generate the desired reaction, the acknowledgement discourse requires a lot of work. So far many beneficiaries still lack a clear understanding of what this payment is. Many feel sceptical about the payment, and this could be due to the fact that they intuitively

compare it to the other government benefit, namely Bolsa Familia (see section 5.2.3), which is usually higher than the Family component payment amount. FAS have a considerable work to do in relation to implementing the Social, Income and Association components, and moreover explaining the relationship between the three and the payment, emphasizing that the payment is not meant to be the main benefit. It may be suggested that the focus should be diverted from the payment altogether, promoting the other three components as acknowledgement to the forest dwellers, while utilizing the payment as the glue, strengthening the interest to the program and its agenda. The implementation of planned programme activities needs to take place in the nearest future while the interest among the participants is still strong. This way the small cash addition will not be disappointing and will be accepted as a supplement to the other opportunities provided by the programme, as opposed to the reversed situation which currently exists.

6.3.3 The Effects of Non-Monetary Benefits on Attitudes, Motivation, and Behaviour

There are also non-monetary benefits, and it is of interest to see their effects on attitudes, motivation, and behaviour, since they make up such a large part of the BFP.

First, there is the issue of introducing social benefits such as education and health that the communities already are guaranteed by Brazilian law and international human rights, yet do not have access to due to economic and political factors. One could expect that introducing these benefits as part of a contract that requires participation or any other commitment from the residents could affect the way they view the BFP. Positively, these benefits can strengthen the contact between the residents and the state, and both parties draw advantage from them. The promise of improvement could encourage participation and make willingness to cooperate more likely.

Education is seen to be the most important factor in the BFP by FAS workers. They hope that education will have the biggest effect on attitudes, and thus have a long-term effect on motivation and behaviour, thereby removing the need for payments. The results of this initiative will likely not be visible for several more years (if there will be any at all), as the possibilities to put new knowledge into action grows with the introduction of new income opportunities. The residents have also felt that the methods must be further developed.

The effects of the non-monetary benefits on labour are somewhat harder to observe at the moment. As few changes have been made, the effect on labour is limited, except for those few who have lost their income from activities that are prohibited by law. The rest of the population seems to have experienced few changes, but are waiting for new opportunities. This was actually an issue many addressed; they hoped job creation opportunities would arrive soon. This is an issue that depends on the implementation of the Income component, and will take time. There was also the issue of the effect on the value of labour, but the non-monetary benefits have so far not had any effect on labour. However, we noted that many families help each other out during cultivation. The effects on livelihood security are more related to new opportunities provided by the BFP. As these are not yet fully implemented, it is difficult to say what effect they will have. The same goes for the courses and the health benefits.

In regard to effects on attitudes, motivation, and behaviour, the effects cannot be clearly seen yet, or separated from the effect of the payment and the creation of the reserve.

6.4 Monitoring and Control

Concerning the issue of monitoring and control, it is interesting to see how the residents feel about monitoring others and how they feel knowing that they are being monitored themselves by their neighbours.

As discussed in sections 5.3.3.2, only a small fraction admitted that they would do nothing when seeing illegal logging, while most expressed willingness to either talk to the violators and ask them to stop, or inform the authorities. However as already mentioned, we cannot draw a conclusion based on this information, as in most cases these intentions have not yet been tested in practice (only 16 out of 96 have confirmed observing such situations, and only one person reported this observation). The low level of cases of observation may be due to the fact that not all areas are exposed to illegal activities and most of the respondents reside in relatively well-protected zones (isolated communities located far from the roads). One could also assume that since only one out of 16 respondents confirmed that he took action, the willingness to act reflected in the majority of answers in our full sample may not translate into real results. However it must be explained that a lot of the reported observations occurred

before the implementation of the BFP when the infrastructure for reporting was weak, thus the readiness to act was present, but the possibility to act was not.

Unfortunately we also failed to specify in the question what type of violators we meant. If people assumed we were asking about their neighbours, it is not then surprising that about half of the respondents would choose to talk to the violators. However if we had explicitly asked about trying to stop the outside invaders, we may have received a fraction much higher than the 6% of those who reported they would do nothing. Dangers associated with trying to oppose illegal loggers are commonly known among the Amazon residents.

This brings us back to the norms of protection. How strong must they be if people risk their lives by reporting or by interfering directly? Apart from strong internalization of such norms a firm belief in state authorities must be in place. People need to feel absolutely backed up by the state in their attempt to fight illegal logging. They need to know that every time they report a violation, appropriate actions will be taken by the responsible organisations and the guilty will be punished. Even if no risk is involved, inaction by the state will affect motivation in a negative way.

A certain reciprocal relationship may exist between the forest dwellers and the organisations responsible for monitoring and control. FAS are trying to promote the idea of the reserve dwellers being forest guardians, however they are not granted a legal right to punish violators, their function is limited to informing alone. Thus forest dwellers may feel that if they try their best utilizing the limited capacity they have, the organisations who possess much better capacity must demonstrate an effort in proportion to the rights and capabilities of these organisations. If the reserve dwellers sense that their effort is not met to the full extent of the state authorities' capabilities, it may discourage the former to show any effort on their side in the future. Consistency in delivering results by the state bodies will reinforce the permanence of monitoring function among the forest dwellers, strengthening the internalisation of the norms of protection.

We did not obtain information on how many illegal activities in the Juma reserve are stopped by the state and how often that happens. Even though the majority of respondents testified that the deforestation in the area has decreased (Figure 17, section 5.4.3), we did hear stories during the individual interviews, where people talked about how they still see the boats loaded

with timber passing by in the night (section 5.4.1.2). We are aware of the fact that shortage of staff is usually a big issue in monitoring organisations in the Amazon region and their functioning is often undermined by corruption. However we cannot make any statements based in this information. The situation may be improved with the construction of the monitoring base planned by FAS as well as by general improvement in communication among the reserve dwellers and the authorities. The information provided in the general meetings has already made it more understandable how the residents can perform their role in assisting state authorities. We expect that the active presence of FAS in the reserve will make that link even stronger.

The data presented in section 5.4.1.2 (Figure 13) shows that about one third of the respondents feel pressured by others to follow the rules. This may be considered both as a positive as well as a negative trend. On one hand, there is a certain degree of control coming from within the reserve and not only from the external structures. This confirms our assumption that people do monitor each other. However we lack data on whether it is common for people to report each other. It could be that the risk of causing a conflict within the community is a control tool enough to keep people from violating the rules. As most communities are made up of relatives, cooperation should be high, and choosing individual gain over the community's loss can more easily provoke conflict, as the community loses income from the Association component, and the individuals face resource depletion[37]. However it is questionable if neighbours would try to stop some minor logging knowing that the person is doing that out of financial need in the family. On the other hand the fact that people feel pressured to follow the rules may indicate that they are obeying out of fear or out of desire to avoid social retaliation, and no internalized norms supporting compliance with the rules exist.

If we turn to Ostrom's design principles for common resource management (section 3.1.6), presence of graduated sanctions is essential to strengthening the monitoring systems. The arrangement for implementing this principle is already in place according to the Juma reserve management plan (section 5.3.3.1). Once the probationary period of two years before the new zoning regulations become well established is over, it is expected that all violations will be

[37] The risk of resource depletion is more likely to prevent non-cooperation if there is a feedback loop that makes the residents aware of the consequences of their actions. In the case of the size of the Juma reserve, detecting negative effects of for example deforestation may be problematic.

punished in proportion to their severity according to the decision made by the deliberative council, where representatives of the communities will also play a role. This should reinforce the sense of involvement in the management process and also accountability to each other among the community members. However these are only projections, as the implementation of such measures has not yet started.

Further it is difficult to differentiate what is most influential in keeping people involved in the process of monitoring and control: the establishment of the reserve or affiliation with the programme. BFP requires that the reserve rules are followed, so in the end it is the reserve rules which have more weight. This means that even those not participating in the programme would have to live in accordance with the state law. However the programme provides informative support and links rules, participants and responsible authorities together.

Finally, there are limited transaction costs associated with the monitoring and control for the reserve residents. Their monitoring capacity is linked to their constant presence in the area. People in the reserve are usually aware of any newcomers or other changes in the surroundings; the word of mouth spreads fast. They are not required to ride to Novo Aripuanã to inform IBAMA's representatives every time they spot a violation. Since FAS officials are present in the communities on the regular basis, the information can be delivered through them, or to the community presidents.

6.5 Social Issues

According to the information obtained both from the management plan of the reserve and in the Juma PDD we can observe that even though communities are not the same, they share many features that makes the implementation of the BFP less complicated. Most of residents of Juma do not have a large cultivation area and the agricultural production is mainly for own consumption; almost all of them depend on agricultural activities. The level of education is low, and people have almost the same life standard and use the same transportation system. In addition to that we also observed that they mainly use natural resources based on their subsistence needs. So we could say that the residents of Juma share a positive attitude towards environmental protection, although they were not aware of some negative consequences of their actions

Although we have not focused on gender issues, we noticed that the BFP has a very positive approach to gender. It is relevant to mention that since the BFP is providing the payment scheme to women, traditional roles have changed among the communities in Juma. During our interviews we could perceive that some men were a bit jealous, since the women were the ones receiving the payment. It has empowered local women and led to their participation in decision making regarding household spending.

The local institutions, norms and social dynamics embedded in Juma are specific to the individuals and the area, which can affect the implementation of the BFP in both positive and negative ways. Local people in Juma are organised in communities and they are mainly made up by family members. They do not have religious or other internal conflicts. Close social interaction is very common in the area, and after the implementation of the BFP, just one person said that social interaction among the residents is worse now, due to the fact that he feels that people are pressured by each other to follow the rules. Some at same time reported improvements. The social interaction among residents in Juma can affect individuals' perceptions about cooperation, monitoring and engagement in the programme; it can also affect the perception of the payment scheme. However this close interaction does not necessarily result in feeling obliged to conform to other people's opinions, as most respondents said they did not feel pressured.

Social interaction among the residents of Juma is an issue of fundamental importance since up to this point the programme does not have a proper monitoring system in place where local people can play an essential role. According to the theory used in this study social norms affect behaviour and preferences. How some of the individuals act may affect the behaviour of others within the communities. If one observes that a member of the same community is cooperating, it may also influence the actions of others residents. When people communicate and exchange information one can also change attitudes, and possibly behaviour, towards a specific matter, especially for a social issue like the protection of the environment. However, there is a threat of free-riding, where individuals could continue enjoying the non-monetary benefits that the programme is providing without cooperating. In the case of the BFP, this can be applied to the Association component, which is based on individual participation. Given that free-riding does not have a major impact on the benefits provided by the BFP, many local

people may opt for non-cooperation since they will still receive the non-monetary benefits of the programme, and will not jeopardise other residents' access to benefits.

In relation to the payment scheme we could detect that dwellers of Juma are more or less satisfied with the amount they get, and that they have discussed this among themselves. Yet some of the residents mentioned that the payment is not enough and that the changes they had to make (whether logging, hunting, fishing, or forest harvesting that is now regulated by the reserve management plan) in order to get it are not worth it. We can only speculate that since the payment is not based on opportunity costs or was not discussed with the participants prior to implementation, it is regarded as insufficient by them. However, we found that few people actually made changes in their behaviour in order to participate in the BFP.
When an individual who acts in accordance with social rationality aimed at maximizing communal benefits is suddenly paid by an external actor, individual rationality can be suddenly activated, thus the level of satisfaction with the payment amount may decrease. Residents of Juma may start thinking about their individual interests and therefore they may stop cooperating, or they may lose their motivation in performing environmental protection activities if they think the payment is low. FAS may need to increase the payment in order to achieve results, or better yet reinforce the other non-monetary benefits to address this situation. This entails more costs for FAS in the future, in the case that their plans need to be revised and expanded to reach their objectives.

An interesting issue in the case on Juma, and also in the REDD discourse, is the aspect of poverty alleviation and livelihood quality improvements. Why should money be spent on this, when the true basis for REDD is reduced deforestation? And should private/public funds be spent on this, when the responsibility of providing social benefits lies with the Amazon State, and it is guaranteed to the residents by law? Is the Amazon State not removed from the responsibility of fulfilling their duties in this sense? If it can be shown that life quality improvement initiatives can go hand-in-hand with prevented deforestation plans, and even make behavioural changes easier to accept among the residents in question, then this could be an opportunity to achieve both goals simultaneously. This can enable the facilitator of the project to provide a better life quality, and at the same time secure funding at an international level based on carbon markets. FAS concentrate mostly on supplying infrastructure and utilities, not actual services. The foundation thus assists the Amazon State in improving the lives of its inhabitants and encouraging them to pay more attention to the development of this

region. This empowers both the residents, as they become more aware of their rights, and strengthens the bond between the State and its constituencies. The needs of the residents are basic human rights, and it would be a shame to pass up the opportunity to secure development just because the responsibility lies with another organisation.

6.6 Implications of Paying for Environmental Services

According to the PES theory presented in Chapter 3, there are several issues to be addressed concerning the BFP in the Juma reserve. Depending on the context, and factors such as surrounding institutions, cultural, social and economic factors and other issues, PES schemes will work differently and can have very different outcomes.

The first issue to be addressed is additionality, which is often used to judge the effectiveness of PES schemes. Since the creation of the reserve should have deterred the majority of external actors, and also empowered local people to protect the resources on which they depend, and the focus of the BFP is on internalising norms and encouraging motivation for desired behaviour[38], we could not establish whether the BFP pays for behaviour that would have happened anyway.

Continuing with indirect additionality, which refers to the effect on keeping the participants whose presence ensures that undesired practices do not arise in the project area, we can say that the BFP is successful in this respect. For example, even if payments are distributed to forest dwellers who would not deforest under the BAU scenario, their presence in the area ensures that any outsiders who seek to overexploit the resources are continuously kept away. Of course, there is always a risk that improved conditions and connection to other realities may induce emigration of the local population, as they gain more access to information and new possibilities. However, FAS are aware of this risk, and focus on making living conditions in the forest more attractive than in the city, as they do not wish people to relocate to urban areas, especially since their comparative advantage would most likely not enable them to have a high living standard there.

[38] This is not to say that local communities would not have a negative impact in the future, it is quite possible that they would continue deforesting bit by bit whenever they needed the income, until they crossed a threshold where they could not return from. The BFP is thus preventive of any future threats that the residents may have posed had no action against deforestation been taken.

Another potential problem of PES schemes is leakage. As mentioned in the analysis chapter, the reserve and the BFP have included surrounding communities to provide them with the same opportunities and discourage leakage. Direct leakage is unlikely due to high costs for the residents to relocate logging activities. However, in relation to the outside actors that previously entered the area to deforest, leakage may still be an issue, as they have much higher mobility than the residents, and can easily relocate their activities. In relation to indirect leakage, it is hard to say that the implementation of the BFP has induced increase of prices for local products, since changed prices for crops has been related to natural conditions.

The issues of increased land value can also be disregarded, as the reserve is publically owned. However, the issue of increased population density and rent-seeking can be of interest. It has been confirmed by many respondents and FAS personnel during our fieldwork that moving is a strenuous task in the Amazon, and very costly. Travelling is very hard, families must build their own houses and cut out their own cultivation areas. This takes time, during which the family will have no or a very low supply of food. As the programme is still so new, relocating to the Juma reserve seems unlikely, as the payment is low and does not cover expenses that relocation would entail. However, in a few years, there could be a large disparity between the communities within the reserve, and those communities that lie beyond the scope of the reserve and the BFP. This could then attract people, especially if new income possibilities become widespread, and health and education services have improved as planned. This possibility should be incorporated into FAS strategy, or the Amazon State must be made aware of this fact and take action, such as limiting the immigration of people to the reserve.

It is also relevant to mention that the payment should not interrupt value systems, as the residents in Juma are not that isolated. They are frequently in touch with other communities and often take trips into town, to visit relatives, sell their produce, or for other social activities. Hence, the effect of the payments will not be as large as if they had been unaccustomed to money.

Another way of measuring the success of a PES scheme in distributing benefits is by equity and legitimacy. Equity is related to the fair distribution of goods and benefits in a society. We have already established that this is made easier in Juma by the homogeneity of the communities in the reserve. Legitimacy covers how contracts are negotiated and how outcomes are obtained, and how these processes are accepted by stakeholders. In addition, the

support FAS have from the Amazon State can both strengthen and weaken their position in the eyes of the participants, depending on if the residents trust or mistrust their government. In the case of the BFP in Juma, FAS' role in managing the BFP does not seem to weaken the programme. Furthermore, one of FAS' objectives is to strengthen local organisational structures in relation to not only the programme, but also for community development. This could signal that FAS are sincere in their attempt to build local governance and improve the foundations' legitimacy among the residents. This can increase the permanence of the programme, and increase effectiveness and efficiency. FAS play an important role here, by facilitating the programme and reducing transaction costs, yet not being involved in political and economic issues (to a certain extent at least), and by not letting donors decide how the money is used.

The question regarding whether FAS have an exit strategy from the area is also of interest. FAS revealed that the BFP is planned to run until 2050, when the benefits should be well functioning and the need for the BFP may be superfluous. If FAS have a plan to remove themselves from the area once they have secured that the residents can continue without them, remains to be seen. There is also the issue of disparity between regions within the Amazon State if the BFP continues developing some areas more than others. Perhaps FAS will have to turn their attention elsewhere to ensure that their current work in the Juma reserve is not challenged by deforestation pressures in other areas that receive less attention in development.

6.7 Transaction Costs

The issue we would like to address concerning transaction costs relates to how attractive projects such as the BFP in Juma can be to potential investors. One of the possible co-benefits of creating a reserve is generation of carbon credits which can further be traded. However, the gains from expected emission savings would be less likely guaranteed if a programme such as the BFP were not in place, as reserves rely heavily on the involvement of the local forest dwellers in the process of monitoring and control, which is encouraged by programmes such as the BFP. Thus the cost-efficiency of the project in relation to potential profits from carbon trading is of central importance.

Based on the simplified assumption that the project generates about 4,222,222 of CO_{2e} credits per year[39] through avoided deforestation (based on the total number of credits that the project hopes to generate by 2050, as mentioned in section 1.4), as calculated under the BAU scenario, one can calculate that 7,388,888 tons of CO_{2e} were saved from April 2008 to December 2009 in the Juma reserve. With the price of USD 16 per ton of CO_{2e}, the BFP in Juma could potentially generate USD 118,222,208 (about BRL 236,444,416) in revenues from carbon trading for this period. Considering the costs of establishing and maintaining the programme from April 2008 to December 2009, which include payroll costs (using our average monthly estimate and multiplying it the by 21 months the programme has been running), the total costs fall between BRL 2,599,449 and BRL 4,576,373 (see sections 5.5.1.1 and 5.5.1.2). If we translate these figures into the costs of producing one CO_{2e} credit, we get the range from USD 0.17 (BRL 0.35) to USD 0.30 (BRL 0.61), based on the minimum and maximum costs of the BFP in Juma, and in turn we can compare these costs to the price of one ton of CO_{2e}. Based on these estimates, the project appears to be very profitable. Further, if we consider the fact that the project is in its initial stage and the costs are expected to decline as only the operational costs will remain after full establishment, it looks even more financially appealing, based on the fact that the costs of delivering one CO_{2e} credit will then decrease.

Lastly, cost-efficiency can also relate to how much financial input is required in comparison to the actual value of the benefits delivered to the participants of the BFP. We do not have access to detailed information concerning the figures which can be attributed solely to the value of the benefits provided under the four components of the programme. At this point we can assume that expenditures related to establishing the infrastructure for further benefit delivery exceeds the value of the benefits provided to the communities. This is however characteristic for any project in its initial implementation phase and the ratio of the value of benefits provided to the costs of provision should shift over time. Even if the efficiency of the programme remains low in this respect, it should be outweighed by the profits from trading of carbon credits generated with the help of this programme, if the markets are in place and the prices remain high relative to the costs of the project.

[39] We are aware that the distribution of credits generated each year may be uneven, however we do not possess the information to make a more detailed assessment, and realise that all the calculations which follow from this rough estimate are far from accurate.

Chapter 7 Conclusion

This study aimed to evaluate the potential effects and costs of introducing the BFP to the forest dwellers residing within the Juma reserve. We wanted to assess if the introduction of the BFP has altered attitudes towards the environment, motivation to protect the forest, or changed behaviour on the ground. In order to establish if any changes had occurred, we looked at possible indicators of change in agricultural practices and other livelihood strategies, income levels, awareness of environmental issues, and willingness to be involved in the process of monitoring and control. Other factors examined in this regard are levels of participation in the programme and satisfaction with the BFP. We further wanted to establish how the programme was introduced to the residents, and how effective it is in disseminating new knowledge.

In addition, we also wanted to assess the design and implementation of the programme, the distribution scheme for the resources from the donors to the final recipients, as well as the costs related to establishing and maintaining the BFP both for the facilitator (FAS) and for the participants of the programme.

Lastly, we also wanted to examine the relationship between the Juma reserve and the BFP, and how they reinforce each other through shared infrastructure, common rules, and the exchange of information.

The main objectives of the BFP are to protect the forest against deforestation threats, and at the same time to increase the standards of living of the residents of the Juma reserve through providing education, new income opportunities and improvements of health conditions. In order to achieve these objectives, the programme was designed with four components: Family, Income, Social, and Association. At the moment of our fieldwork, the programme was still in its initial implementation phase, and the only benefit to be widely distributed among the residents was the Family component payments. The benefits from the remaining three components are currently concentrated in one location, thus making initial impacts difficult to evaluate on the general scale for the entire reserve.

The analysis of the research findings brought us to the following conclusions:

7.1 The Introduction of the BFP into the Juma Reserve

The introduction of the programme was facilitated by the creation of the Juma reserve. Establishment of borders, which thus defined the area to which the reserve and the BFP extend, the determination of rules of forest use, as well as the assessment of socio-economic conditions, enabled the BFP to be implemented more efficiently. The relationship between the reserve and the BFP is one of mutual reinforcement, as the reserve provides the legal basis for forest and resource protection, while the BFP strengthens the presence of the reserve by disseminating information pertaining to reserve regulations. In addition, the programme encourages monitoring and control among the participants, without which the reserve would be more vulnerable to outside invasions, large-scale deforestation, and resource exploitation. The BFP has established the infrastructure for reporting illegal activities, while the reserve formally empowers the de facto users to assume the role of protectors of the forest.

Although the reserve and the BFP complement each other in many aspects, the success of the programme also depends on collaboration with various state organisations involved in the management of the reserve and the provision of social services to the reserve dwellers.

Regarding the establishment of the programme, the residents' role was limited. They were not consulted during the initial formulation of the programme. However during the actual implementation of the BFP in the Juma reserve, FAS have attempted to be more cautious in regards to local dynamics.

7.2 The Distribution of Resources of the BFP

The resources of the BFP are distributed among the four components, including an individual family payment; social development improvements in the spheres of education, health, communication, and transportation; new sustainable income opportunities; and strengthening of community organisations. At the time of our fieldwork, the first component of a monthly payment of BRL 50, paid to each female head of the household, was the only one which was largely implemented to its full extent, with 321 families receiving monthly payments (while 57 families were in the process of acquiring the necessary documentation). The other components had so far provided one school offering education from 5th to 8th grade, one completed health station, several speed boats for transportation, several communication bases,

and various courses related to improving income possibilities and nutrition practices. Several projects for the individual communities were also underway. All the communities had elected presidents for representation, and a deliberative council had been created. The extension of these undertakings was expected to fall in place in the near future.

The financing of the benefits of the BFP in the Juma reserve lies with Marriott International, a hotel chain which has made a contract with FAS, and in return to funding of the project, they receive the right to purchase carbon credits generated through avoided deforestation in the reserve. However, regardless of this investment, FAS are the sole decision-maker concerning distribution of funds and administration of the programme. Nonetheless, FAS do cooperate with responsible state organisations in designing the education programme, and receive support from various stakeholders.

The local communities were not consulted during the design of the distribution of the resources. However, this does not mean that FAS do not intend to distribute the benefits equally among the participants. There are a few communities which have been chosen as strategic locations for infrastructural development; however FAS ensure that all participants shall have equal access to these facilities.

The individual family payment was not based on opportunity costs, but rather on the availability of funds and the number of families that FAS hoped to include.

7.3 Monitoring and Control of the Rules

Since the BFP was implemented recently, the rules have not yet been fully introduced to the residents. However, most residents were familiar with rules regarding no deforestation, no hunting or fishing for commercial purposes, and no expansion of agricultural activity into the primary forest. These rules are common for both the reserve and the BFP. The zoning regulations for forest product harvesting had not been out into effect at the time of our presence in the reserve, thus we could not evaluate the level of compliance with these rules.

The BFP improves the link between the residents and the relevant authorities responsible for law enforcement and emphasises the strengthening of certain control mechanisms, such as encouraging reporting of illegal activities. The local communities play a central role in monitoring and control of their resources, by being present in the area. By focusing on the

role of the residents as forest protectors, the programme ensures that the reserve fulfils its function of keeping outsiders away, and in addition reduces transaction costs for the reserve.

7.4 Impacts on Behaviour

We found that the traditional lifestyle of the local communities was not in conflict with the new rules introduced by the reserve and the BFP. Thus we did not observe any significant shift in their agricultural and harvesting practices. The rate of deforestation caused by the reserve residents has always been minimal, and there is little change to report. Thus the main impact of the reserve creation and the presence of the BFP in the area has been on outside actors. Other rules that can potentially affect behaviour have not yet been put in place as the management plan for the reserve was completed after we had completed our fieldwork, thus we could not assess the impacts of these rules. Further, we cannot establish the potential effect of the BFP on behaviour in relation to the residents' role in protecting the forest, as it is hard to separate from the impacts of the reserve creation.

Regarding income, we observe few changes which can be directly attributed to the introduction of the BFP. Since the programme does not seem to alter income in a negative way for the majority of the participants, there is little objection to following the rules. This is also connected to that there is little change in actual behaviour for the residents which was necessary for participation in the programme.

7.5 Impacts on Attitudes

We were unable to establish if there is any substantial impact on attitudes from introducing the payment, as most respondents did not view the payment as a significant change in their lives or as a motivating factor for altering their practices, even though these alterations may not have been considerable. However, most residents expressed positive attitudes towards the programme for providing them with new information and education opportunities. These changes were viewed as central for increasing their awareness of the importance of environmental protection. The factor that is most likely to affect attitudes is education, yet as this component is not fully implemented, any eventual changes are difficult to measure.

7.6 The Combined Impacts of the Reserve and the BFP on Attitudes and Behaviour

As mentioned before, we could not separate the effects of the BFP from the effects of the reserve creation. In addition, any changes required from the implementation of the BFP are also required by the rules of the reserve, which are also state law. The programme becomes a bonus in this sense, as it provides benefits in addition to demanding conformity to the rules. The BFP could create a positive attitude towards environmental protection, making any possible opposition that arises from the introduction of the rules less likely. We also expect that the combined effect of these two mechanisms will be stronger than if each had existed separately.

7.7 Opportunities Arising from the Benefits of the BFP for the Residents

The benefit that has made the most tangible addition to the residents' life so far is the knowledge provided through information meetings and education. The school provides the possibility to continue basic education closer to home than before. The agro-ecology class, which is specifically tailored to the conditions of the area, is a distinct feature of the programme, and is expected to produce a significant positive impact on attitudes and behaviour in the future. Other opportunities related to income hope to expand livelihood strategies, and place the residents in a better position to receive increased economic value for forest products. However, the real impacts on livelihood security may not be visible for some time. How soon the results become apparent depends on continuously increased participation and ability of the BFP to include as many participants as possible. Opportunities from other benefits are yet to be noticed.

In relation to the payment, even though it may not be perceived as high, it still does make a contribution to reducing costs related to purchasing basic household goods. The extent to which the payment can influence purchasing power will largely depend on the income level of the recipients.

7.8 Education on Environmental Issues

We could observe that the BFP has succeeded in introducing some concepts of environmental protection and in explaining the link between local behaviour and possible negative effects, which were previously unknown to the residents. Even though we could not establish if any strong norms of protection were present among the communities, we did not find any indications of norms which would conflict with the idea of environmental protection. Thus we expect positive results from the education efforts. The strong presence of FAS in the area continuously reinforces environmentally friendly action, and is expected to promote norms of protection.

We observed that the residents seem to have the willingness to be involved in the programme, yet FAS needs to implement the programme activities on a wider scale and make them more available to the participants. During our study we felt that participation may be somewhat passive on behalf of the residents, as many changes have been made to their social setting relatively fast, and they may need more time to readjust and assume a more proactive position.

7.9 Transaction costs

Even though we could not establish a precise level of costs of establishment and operation of the BFP for FAS in the Juma reserve, we expect the cost-efficiency in terms of the resources spent in comparison to the value of the benefits delivered to be reduced once the programme passes its initial phase. This programme format also seems to appear attractive for potential investors who may be interested in generating profits from carbon credit trading. This will of course largely depend on market conditions and actual levels of emissions savings.

As for the costs of participation for the residents of the reserve, we arrived to the conclusion that there may be some inconveniences associated with attending the programme activities, but not with collecting the payment. It must be further noted that FAS try to accommodate the needs of the participants when organising the activities.

7.10 Satisfaction with the Programme

We conclude that the level of satisfaction among the residents is generally good. We could not detect any factors affecting the level of satisfaction apart from the level of income of the participants. It appears that those with the higher income level feel more satisfied than others. It seems logical that those with less income have higher expectations from the BFP, and feel disappointed as the programme is new and not all of its benefits can be experienced yet. Many expressed dissatisfaction with the level of the payment; but even though the payment amount will not be increased, the residents' satisfaction levels should improve when more benefits from the Income, Social, and Association components start arriving. However, there must be an understanding in relation to the facilitators of the programme that the implementation of changes of such a scale requires time, and that equally distributed effects cannot be produced immediately.

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APPENDICES

Appendix I: Household Questionnaire

Section A: Household Socio-economic conditions (characteristics and composition)

1.Age and gender of respondent

2.Household status

3.Years of education completed

4.Do you work in connection with the BFP?

a.Yes

b.No

4.1 If yes, with what?

5.Were you born here?

a.Yes

b.No

5.1 If not, how many years have you been living in Juma?

6.How many people live in your house?

6.1 Has the number of people in the household changed in the last two years?

a. Yes

b. No

6.2 If yes, why?

Section B: Household resource/land use, income

7.Which products does your family depend on the most?

Livelihood strategy	Crop production (specify if grown or gathered)	Animal products	Forest products	Salary/wages (specify job and amount)	Financial support from elsewhere (specify source and amount)	BFP	Others (specify)
Importance (now)							
Importance (before)							

1, 2, 3, 4, 5 – in the order of importance for the respondent

8.What is the monthly agricultural production for your household?

9.Do you cultivate your land differently now compared to before the implementation of the BFP? (tools, hours, method, fertilizer)

a.Yes

b.No

9.1 If yes, what are you doing differently?

10.Forest use and income: Please list the 5 most important forest products your household depends on:

11.Forest use and income: Please list the 5 most important forest products your household depended on before the BFP:

12.Where do you sell your products?

a.Local market

b.Roadside/ riverside

c.Within the reserve

d.Others (specify)

13.What is the estimated expenditure for your household now?

13.1 Has the BFP family money allowed you to buy more?

a.Yes
b.No
c.Do not know

13.2 If yes, what?

14.What was the estimated expenditure per month before BFP?

14.1 What did you usually buy?

Section C: Household access to land resources – property issues and use

15.Do you cultivate land outside of the reserve?

a.Yes

b.No

16.Did you cultivate land outside of the reserve before the BFP started?

a.Yes

b.No

Section D: BFP requirements and attitudes to the programme

17.Are you familiar with the BFP and its rules and conditions?

a.Yes

b.No

17.1 If yes, can you tell us about them?

17.2 If yes, what do you think about them?

18.Do you receive payments from the BFP?

a.Yes

b.No

19.Is the payment worth the changes you had to make in order to receive the money?

a.Yes

b.No

c.Not changes

d. Do not know

20.Do you see the BFP (payment) as:

a. Does not help your household

b. Helps your household

c. Helps your household a lot

Section E: BFP payments and use of money *(skip 32 if not receiving payments)*

21.What distance do you have to travel to receive the BFP payments in cash?

21.1 How long do you stay in the city?

21.2 How often do you go to collect the payment?

21.3 How long does it take to get there?

21.4 How much does it cost to get there?

22.Are you familiar with the payment scheme at the community level?

a.Yes

b.No

22.1 If yes, do you participate in deciding how to spend these payments?

a.Yes
b.No

23.Do you know how the money is spent by the community?

23.1 What are the community payments spent on?

a.Yes
b.No

23.2 Do you think the community payments are well spent?

a.Yes
b.No

Section F: BFP Non-monetary benefits (education, health, business opportunities)

24.Which other non-monetary benefits do you receive from the BFP?

24.1 What do you think about them?

24.2 Which one is the most important for you?

25.What do you learn from the first information meeting (oficina) with BFP?

25.1 Does what you learn affect your behaviour and agricultural practices?

a.Yes
b.No
c.Do not know

Section G: BFP and local peoples' participation and transaction costs

Compulsory information meeting

26.Where was the first meeting you attended held?

27.How much time did it take to participate in the meeting?

27.1 Was it hard for you to attend?

a.Yes
b.No

27.2 What did you have to give up something in order to attend?

27.3 How long did it take to get there?

BFP activities

28.What courses offered by the BFP do you know?

29.How many have you been to?

29.1 Which courses have you attended?

29.2 Where was the course held?

30.How do you perceive the BFP activities?

1. Very Bad	2. Bad	3. Indifferent	4. Good	5. Very Good

If bad or very bad, why so is it so? If more than one reason, please list them:

a.Benefit is not worth participation

b.We have not been told properly about their activities

c.Others (specify)

31.How much time does it take for you to attend?

31.1 Was it hard for you to attend?

a.Yes
b.No

31.2 What did you have to give up in order to attend these activities?

31.3 Time spent travelling

32.Would you say that your community is involved in BFP activities?

a.Yes
b.No

Section H: Attitude and perception of local people towards the forests, and the impact of the BFP

33.Please rate the current importance of different ways of forest use:

Product	Timber	Firewood	Hunting	Harvesting	Fishing	Other (specify)
Importance (Now)						
Importance (Before)						

1, 2, 3, 4, 5 – in the order of importance for the respondent

34.Has the introduction if the BFP changed your attitude towards the forest?

a.Yes

b.No

34.1 If yes, how was your attitude towards the forest before the BFP?

34.2 Were you familiar with the concept of forest conservation before the introduction of the BFP?

a.Yes

b.No

34.3 If yes, what did you know?

35.Can you see any changes in the reserve for the past year?

a.Yes

b.No

c.Do not know

35.1 If yes, what are these changes?

36.Are you involved in logging activities?

a.Yes, as much as before

b.Yes, but less than before

c.Was engaged before, but stopped completely

d.Never was engaged

36.1 If your actions have changed from before, why is that?

37.If you see anyone involved in logging or illegal activities in your area, what would you do?

a.Nothing

b.Convince her/him not to do so

c.Inform the concerned authorities

38.1 Why do you take this action?

38.Do you believe that the logging activities have changed in your area within the past year?

a.Increased

b.Decreased

c.Did not change

d.Do not know

39.1 Why do you think this is the case?

39.Have you ever received money to work with loggers?

a.Yes

b.No

40.Has the relation between the members of the community changed since the implementation of the program rules?

a.Better

b.Worse

c.Same

41.1 If yes, in which ways?

41.Do you feel pressured by others to follow the rules of BFP?

a.Yes

b.No

42.1 If yes, how?

Section I: General satisfaction, opinions and expectations in regards to the BFP

42.Are you satisfied with the BFP?

1. Not satisfied	2. More or less satisfied	3. Don't know	4. Satisfied	5. Very satisfied

43.In your opinion, is the BFP useful for protecting the forest?

a.Yes

b.No

44.1 Please explain

44.In your opinion, is the BFP useful for helping your family?

a.Yes

b.No

45.1 Please explain

45.What would you change with the BFP?

46.1 If you want to increase the payment, how much would you increase it to?

46.Has the BFP had any negative consequences for your community?

a.Yes

b.No

c.Do not know

47.What expectations for the future do you have in relation to the BFP?

Appendix II: FAS Financial Reports

FAS MONTHLY AVERAGE PAYROLL AND ADMINISTRATIVE COSTS

Wages and HR			**% for the BFP in Juma**
Monthly wages (brutto monthly values)	BRL	182 000,00	5
Labour costs	BRL	89 200,00	5
INSS (Tax)	BRL	55 000,00	5
Income Tax	BRL	17 000,00	5
FTGS (Tax)	BRL	15 200,00	5
Other	BRL	2 000,00	5
13th wage and Holidays	BRL	20 172,00	5
Costs without 13th wage and holidays	BRL	9 886,00	5
Monthly Provisions - Dismissals	BRL	17 260,00	5
Medical	BRL	17 500,00	5
Health Plan	BRL	14 000,00	5
Dental Plan	BRL	1 700,00	5
Sindicate Tax (monthly)	BRL	1 500,00	5
Other Expenses (registration, exams, etc)	BRL	2 000,00	5
Transportation (public)	BRL	8 100,00	5
Life Insurance	BRL	2 500,00	5
Retirement Aid (general director)	BRL	1 170,00	5
Human Resource Programmes			
Internal, External Training	BRL	3 500,00	5
Seminars (incl. Transportation and Accommodation)	BRL	4 000,00	5
Total HR Costs	**BRL**	**463 688,00**	

OTHER AVERAGE MONTHLY COSTS

Consultants	BRL	15 000,00	5
Air Tickets	BRL	45 000,00	5
Per diem	BRL	22 000,00	5
Boat and Land Transport	BRL	5 000,00	5
Vehicles and Fuel Expenses	BRL	4 500,00	5
Fieldwork Expenses	BRL	65 000,00	10
Marketing (Events, Publications, etc)	BRL	22 000,00	5
Board Meetings, Consultation Meetings	BRL	5 000,00	5
Telecommunications, Internet	BRL	22 000,00	5
Office Spaces (material, maintenance, security)	BRL	15 000,00	5
Deloitte (accounting)	BRL	25 000,00	5
Taxes, Duties, Tariffs	BRL	3 000,00	5
IT	BRL	8 000,00	5

Rental, Insurance	BRL	10 000,00	5
Total Administrative Costs (without HR)	BRL	266 500,00	
TOTAL FIXED MONTHLY COSTS	**BRL**	**730 188,00**	

Marriott Juma Programme – Total Disbursements April 7th to December 31st 2008:

MARRIOTT JUMA PROGRAM - TOTAL DISBURSEMENT LINES - PERIOD : APRIL 7 - DECEMBER 31, 2008

PG 1 MARRIOTT JUMA PROGRAM - TOTAL DISBURSEMENT - PERIOD: APR 7 - DEC 31, 2008		(B) F.A.S. Start-up funds (R$ 500 K)	(C) Pre-Validation & Spirit to Preserve (US$ 300 K)	(D) Contribution from MI US$ 500 K	TOTAL in REAIS
Revenue (Budget line allocation)		500.000,00	609.474,38	1.090.683,46	2.200.157,84
Interest from temporary investment				10.533,78	10.533,78
Total Revenue Line		500.000,00	609.474,38	1.101.217,24	2.210.691,62
Disbursements (line items below)		500.012,32	609.474,38	363.499,63	1.472.986,33
Bolsa Floresta Program	17,05%				
1	Infra-structure and Equipment	14.822,95	-	-	14.822,95
1.1	Equipments				-
1.2	Operational base	14.822,95			14.822,95
2	Bolsa Floresta Program Payments	420,00	-	34.606,00	35.026,00
2.1	Bolsa Floresta Family			25.600,00	25.600,00
2.2	Bolsa Floresta Association	420,00		9.006,00	9.426,00
2.3	Bolsa Floresta Social				-
2.4	Bolsa Floresta Income Generation				-
3	Workshops and Social Mobilization	52.176,90	-	-	52.176,90
3.1	Bolsa Floresta Program workshops	29.633,90			29.633,90
3.2	Community meetings	22.543,00			22.543,00
	TOTAL (D)	67.419,85	-	34.606,00	102.025,85
A. Health and Education	28,96%				
1.	Infra-structure and Equipment	18.500,00	494.705,84	286.257,49	799.463,33
1.1	School (with solar panel) - Abelha and São Miguel	6.360,00	94.662,60	49.231,25	150.253,85
1.2	J.W. Marriott, Jr. School (with solar panel) - Boa Frente	12.140,00	166.803,23	95.086,94	274.030,17
1.3	Teachers' House (with solar panel) Abelha, São Miguel			24.844,20	24.844,20
1.4	Teachers' House (with solar panel) - Boa Frente		65.704,37	24.844,20	90.548,57
1.5	Student Forest House (with solar panel) - Boa Frente		39.574,24		39.574,24
1.6	Pro-Chuva Program				-
1.7	Ambulance boats		68.089,72	6.400,00	74.489,72
1.8	Community boat		310,00		310,00
1.9	Antenna and communication equipments (Pre-validation)		800,00	8.456,90	9.256,90
1.10	Material transportation (Pre-validation)		16.038,54		16.038,54
1.11	Fuel for material transportation (Pre-validation)		40.601,42		40.601,42
1.12	Material transportation				-
1.13	Fuel for material transportation			4.720,00	4.720,00
1.14	Health post and equipment		2.121,72	72.674,00	74.795,72
2	Operational Staff	-	-	320,00	320,00
2.1	Support to Teacher and Health Agents				-
2.2	Project & Works Manager (partial)			320,00	320,00
2.3	Site Construction Foreman (Pre-validation)				-
2.4	Site Construction Foreman (partial)				-
2.5	Consultancies for trainning and activities				-
3	Maintenance Costs	-	-	260,00	260,00
3.1	Computers and school materials				-
3.2	Permaculture and agroextractivism				-
3.3	Fuel, lubricants and maintenance			260,00	260,00
	TOTAL (A)	18.500,00	494.705,84	286.837,49	800.043,33

PG 2 MARRIOTT JUMA PROGRAM - TOTAL DISBURSEMENT - PERIOD: APR 7 - DEC 31, 2008		(B) F.A.S. Start-up funds (R$ 500 K)	(C) Pre-Validation & Spirit to Preserve (US$ 300 K)	(D) Contribution from MI US$ 500 K	TOTAL in REAIS
B. Sustainable Production	**6,80%**				
1	**Infra-structure and Equipment**	**8.386,00**	**19.373,00**	**-**	**27.759,00**
1.1	Support to nautical activities		19.373,00		19.373,00
1.2	Internal communication bases				-
1.3	Personal protection equipments				-
1.4	Motorcicle	8.386,00			8.386,00
1.5	Vehicle 4X4				-
1.6	Greenhouse for nuts (see also on Forest Allowance - Income Generation)				-
1.7	Community Saw Mill				-
2	**Operational Staff**	**-**	**-**	**-**	**-**
2.1	Consultancy				-
3	**Maintenance Costs**	**-**	**-**	**-**	**-**
3.1	Field and office materials				-
4	**Trainning and Capacity Building**	**-**	**-**	**-**	**-**
4.1	Capacity building for Organic and Fair Trade certification	-	-		-
4.2	Strenghtening of grassroots organizations and cooperatives	-	-		-
	TOTAL (B)	**8.386,00**	**19.373,00**	**-**	**27.759,00**
C. Monitoring and Law Enforcement	**7,26%**				
1.	**Infra-structure and Equipment**	**-**	**-**	**1.600,00**	**1.600,00**
1.1	IPAAM Monitoring Base			1.600,00	1.600,00
1.2	External Communication Bases				-
1.3	Equipments for Monitoring Bases				-
1.4	Field trip materials				-
1.5	IPAAM monitoring boat				-
2.	**Operational Staff**	**0,00**	**0,00**	**0,00**	**0,00**
2.1	GIS Technician (50%)				-
2.1	Consultancy				-
3.	**Maintenance Costs**	**6.725,31**	**-**	**-**	**6.725,31**
3.1	Fuel, lubricants and maintenance	5.075,31			5.075,31
3.2	Food	1.650,00			1.650,00
3.3	Field per diems				-
3.4	Office materials and uniforms				-
4.	**Trainning and Capacity Building**	**-**	**-**	**-**	**-**
4.1	Trainning and Capacity Building				-
	TOTAL (C)	**6.725,31**	**-**	**1.600,00**	**8.325,31**
D. Support to Protected Area Management	**9,41%**				
1	**Operational Staff (salaries and payroll costs)**	**-**	**-**	**-**	**-**
1.1	Project Coordinator (50%)				-
1.2	Project Assistant (50%)				-
1.3	Field Coordinator				-
1.4	Field Assistant				-
2	**Per diems, Accomodation, Food and Transport**	**6.861,00**	**0,00**	**0,00**	**6.861,00**
2.1	Technical staff	439,00			439,00
2.2	Project Coordinator	850,00			850,00
2.3	Project Assistant	445,00			445,00
2.4	Field Coordinator				-
2.5	Field Assistant				-
2.6	Technicians and consultants	5.127,00			5.127,00
3	**Transport**	**3.178,14**	**600,00**	**0,00**	**3.778,14**
3.1	Domestic air travel	1.578,14			1.578,14
3.2	Local air travel				-
3.3	Local land transport				-
3.4	Boat tickets	1.600,00	600,00		2.200,00
4	**Promotional and Advertisement Material and Events**	**11.550,00**	**4.000,00**	**2.400,00**	**17.950,00**
4.1	Model	2.450,00	4.000,00		6.450,00
4.2	Brochures (partial contribution)				-
4.3	Videos				-
4.4	Events (partial contribution)	9.100,00		2.400,00	11.500,00
5	**Miscelaneous**	**0,00**	**0,00**	**0,00**	**0,00**
5.1	Miscellaneous materials				-
5.2	Management plan development				-
	TOTAL (D)	**21.589,14**	**4.600,00**	**2.400,00**	**28.589,14**

PG 3 MARRIOTT JUMA PROGRAM - TOTAL DISBURSEMENT - PERIOD: APR 7 - DEC 31, 2008			(B) F.A.S. Start-up funds (R$ 500 K)	(C) Pre-Validation & Spirit to Preserve (US$ 300 K)	(D) Contribution from MI US$ 500 K	TOTAL in REAIS
E. Scientific Development and Certification Process		**14,10%**	**Year 1**			
1	Research, Methodology, Certification and Publication		357.641,02	-	-	357.641,02
1.1	Research (biodiversity monitoring)					-
1.2	Carbon methodology and certification process		357.395,12			357.395,12
1.3	Carbon dynamics research					-
1.4	Promotion and scientific workshops					-
1.5	Technical publications					-
1.6	Research materials		245,90			245,90
		TOTAL (E)	357.641,02	-	-	357.641,02
F. Bank Fees		**0,34%**				
1	Bank Fees		-	158,00	5.235,64	5.393,64
1.1	Bank Charges, (account and transfer fees)			158,00	1.091,04	1.249,04
1.2	Foreign Exchange fees - USA (USD 30,50) per transaction					-
1.3	Foreign Exchange fees - BRAZIL (USD 50) per transaction					-
1.4	Brazilian Exchange TAX (I.O.F 0,38% on Total amount received)				4.144,60	4.144,60
		TOTAL (F)	-	158,00	5.235,64	5.393,64
G. Other		**16,08%**	**Year 1**	**Year 1**	**Year 1**	**Year 1**
1	Others		19.751,00	90.637,54	32.820,50	143.209,04
1.1	Event - Project Launch (Manaus, Juma)		10.366,00	90.000,79	32.820,50	133.187,29
1.2	To be defined					-
1.3	External Audit		9.385,00	636,75		10.021,75
		TOTAL (G)	19.751,00	90.637,54	32.820,50	143.209,04
		TOTAL				
Amount in Brazilian Reais			500.012,32	609.474,38	363.499,63	1.472.986,33
Total Amount in US Dollars (average exchange rate US$/R$: 2,0389)			229.205,74	279.383,17	166.628,30	675.217,20
			2,1815	2,1815	2,1815	2,185
Net Result in REAIS			**- 12,32**	**-**	**727.183,83**	**727.171,51**

Marriott Juma Programme – Total Disbursements 2009:

MARRIOTT JUMA PROGRAM - TOTAL BUDGET LINES - PERIOD: 2009
Disbursement as of 31st Dec, 2009

REVENUES:	**Brazilian Reais (R$)**
From Marriott:	**1.649.235**
Balance 2008 Received From Marriott International	752.646
Received from Marriott International in 2009	882.445
Income from temporary cash investment	14.145
From FAS:	**551.837**
FAS direct contributions to the program in 2009	551.837
Tatal amount available for 2009	**2.201.073**

(-) DISBURSEMENTS:		
		Total Spent on 12/31/09
PBF. Bolsa Floresta Program - Payment for Environmental Services		
1	**Infra-structure and Equipment**	**62.701**
1.1	Equipment	30.396
1.2	Operational Base	32.304
2	**Bolsa Floresta Program Payments (Note 1)**	**262.932**
2.1	Bolsa Floresta Family	168.900
2.2	Bolsa Floresta Association	41.334
2.3	Bolsa Floresta Social	
2.4	Bolsa Floresta Income Generation	52.697
3	**Workshops and Social Mobilization**	**1.737**
3.1	Bolsa Floresta Program workshops	1.737
3.2	Community meetings (Note 2)	
	TOTAL BOLSA FLORESTA	**327.369**

A. Health and Education		
1.	**Infra-structure and Equipment** (Note 3)	**1.180.286**
1.1	School (with solar panel) - Abelha and São Miguel	220.642
1.2	J.W. Marriott, Jr. School (with solar panel) - Boa Frente	70.733
1.3	Teachers` House (with solar panel) Abelha, São Miguel	87.372
1.4	Teachers` House (with solar panel) - Boa Frente	11.478
1.5	Student Forest House (with solar panel) - Boa Frente	63.098
1.5 RV	Construction of River Walk (Note 4)	201.269
1.6	Pro-Chuva Program and Waste Treatment	65.624
1.7	Ambulance boats	-
1.8	Community boat	-
1.9	Antenna and communication equipments	12.296
1.10	Material transportation	1.424
1.11	Electrification project (note 5)	287.275
1.12	Material transportation	61.004
1.13	Fuel for material transportation	96.571
1.14	Health post, equipment	1.500
2	**Operational Staff**	**63.964**
2.1	Support to Teacher and Health Agents	6.206
2.2	Project & Works Manager (partial)	1.160
2.3	Site Construction Foreman (Pre-validation)	720
2.4	Site Construction Foreman and Labor (partial) (Note 7)	55.399
2.5	Consultancies for training and activities	480
3	**Maintenance Costs**	**97.574**
3.1	Computers and school materials	17.295
3.2	Permaculture and agroextractivism	40.020
3.3	Fuel, lubricants and maintenance	40.260
	TOTAL (A)	**1.341.825**

B. Sustainable Production (Note 6)		
1	**Infra-structure and Equipment**	**4.916**
1.1	Support to nautical activities	4.916
1.2	Internal communication bases	
1.3	Personal protection equipments	
1.4	Motorcycle	
1.5	Vehicle 4X4	
1.6	Greenhouse for nuts	
1.7	Community Saw Mill	
2	**Operational Staff**	**-**
2.1	Consultancy	
3	**Maintenance Costs**	**7.552**
3.1	Field and office materials	7.552
4	**Training and Capacity Building**	**8.310**
4.1	Capacity building for Production (Note 7)	7.390
4.2	Strengthening of grassroots organizations and cooperatives	920
	TOTAL (B)	**20.778**
C. Monitoring and Law Enforcement		
1.	**Infra-structure and Equipment**	**273.994**
1.1	IPAAM Monitoring Base	63.473
1.2	External Communication Bases	
1.3	Equipments for Monitoring Bases	111.571
1.4	Field trip materials	
1.5	IPAAM monitoring boat	
1.6	Vehicle 4x4	89.000
1.7	Motorcycle	9.950
2.	**Operational Staff**	**-**
2.1	GIS Technician (50%)	
2.2	Consultancy	
3.	**Maintenance Costs**	**1.590**
3.1	Fuel, lubricants and maintenance	
3.2	Food	1.590
3.3	Field per diems	
3.4	Office materials and uniforms	
4.	**Training and Capacity Building**	**-**
4.1	Training and Capacity Building	
	TOTAL (C)	**275.584**

D. Support to Protected Area Management		
1	**Operational Staff (salaries and payroll costs)**	**2.545**
1.1	Project Coordinator (50%)	2.144
1.2	Project Assistant (50%)	
1.3	Field Coordinator	
1.4	Field Assistant	401
2	**Per diems, Accommodation, Food and Transport**	**17.090**
2.1	Technical staff	4.600
2.2	Project Coordinator	
2.3	Project Assistant	
2.4	Field Coordinator	4.568
2.5	Field Assistant	
2.6	Technicians and consultants	7.922
3	**Transport**	**23.509**
3.1	Domestic air travel	6.105
3.2	Local air travel	12.930
3.3	Local land transport	3.742
3.4	Boat tickets	732
4	**Promotional and Advertisement Material and Events**	**2.022**
4.1	Model	
4.2	Brochures (partial contribution)	
4.3	Videos	1.458
4.4	Events (partial contribution)	564
5	**Miscellaneous**	**79.544**
5.1	Miscellaneous materials	399
5.2	Management plan development	79.145
	TOTAL (D)	**124.711**
E. Scientific Development and Certification Process		
1	**Research, Methodology, Certification and Publication**	**88.099,74**
1.1	Research (biodiversity monitoring)	
1.2	Carbon methodology and certification process	38.517
1.3	Carbon dynamics research	47.525
1.4	Promotion and scientific workshops	525
1.5	Technical publications	
1.6	Research materials	1.533
	TOTAL (E)	**88.100**
F. Bank Fees		
1	**Bank Fees**	**4.362**
1.1	Bank Charges, (account and transfer fees)	958
1.2	Foreign Exchange fees - USA (USD 30,50) per transaction	1.770
1.3	Foreign Exchange fees - BRAZIL (USD 50) per transaction	
1.4	Brazilian Exchange TAX (I.O.F 0,38% on Total amount received)	1.634
	TOTAL (F)	**4.362**

G. Other		
1	Others	14.077
1.1	Event - Project Launch (Manaus, Juma)	
1.2	Miscellaneous	14.077
	TOTAL (G)	14.077
Total Disbursed in 2009		2.196.805

Extra Revenue in December 2009 (Note 9)	172.000,00
BALANCE IN 31st DEC 2009	176.267,35

Note 1: The four components of Bolsa Floresta Program are the main investment lines, representing FAS' core business. Main disbursements of each component below:
Association: Fuel (1,440), Board meeting (1,000), Head office construction (5.893),Fast Boat (26,700), Computer (1,640), Office material (314).
Income Generation: Family warehouse for Brazil Nut drying (2,508), Boat for production transportation (50,000).
Family: 321 families benefited in September (16.050).

Note 2: FAS has not accounted into the project many community meetings and team's visiting, paid from its own sources.

Note 3: The budget lines were divided before the project actions started on field. This way, some spending that were not projected to happen this year, had to be allocated under the already existing lines. For example, the school operational costs had to be allocated under the school infrastructure investment line. This operation aspects will be covered from a budget stand point for 2010.

Note 4: This budget line was included because of its relevance among the costs. This activity was not predicted before the project implementation, so it was not considered for the budget estimation.

Note 5: The name of this investment line was changed in order to better fit the actual disbursements. The electrification project was not predicted before the project implementation, so it was not considered for budget estimation.

Note 6: Most of the investments done in sustainable production for income generation already predicted in the program are considered in the Bolsa Floresta Income investment line (PBF 2.4). The amounts allocated under this investment line are part of the support activities or any additional activity related to income generation.

Note 7: The name of this investment line changed in order to better represent the activities made.

Note 8: The name of this investment line changed in order to better represent the activities made.

Note 9: FAS received US$ 100.00,00 in December 2009 from Marriott International, however considered for budget disbursements in 2010

Appendix III: Table of Deliberative Council of the Juma reserve

Composition of the Deliberative Council (FAS 2010a:94)

MEMBERS OF THE COUNCIL	
Public Organisations	
1	State Secretariat of the Environment and Sustainable Development of Amazonas
2	Institute of Environmental Protection of Amazonas
3	Agency of Sustainable Development of Amazonas
4	State Secretariat for Education and Teaching Quality of Amazonas
5	Institute of Agricultural Development of Amazonas
6	Amazonas Land Institute
7	Regional Superintendence of the National Institute for Colonization and Agrarian Reform
8	Foundation for Health Surveillance
9	State Secretariat of Public Safety of Amazonas
10	Sustainable Amazonas Foundation
11	Municipal Chamber of Novo Aripuanã
12	Municipal Secretariat of Environment of Novo Aripuanã
13	Municipal Secretariat of Procurement and Rural Production of Novo Aripuanã
14	Municipal Secretariat of Health of Novo Aripuanã

15	Municipal Secretariat of Social Action of Novo Aripuanã
Civil Society	
16	Syndicate of the Rural Workers of Novo Aripuanã
17	Juma Dwellers' Association
18	Fishermen's Union of Novo Aripuanã
19	Association of Agro-extractivist Workers of the Mariepauá River
20	Communities of the Region of Boca do Juma
21	Communities of the Region of Cipotuba
22	Communities of the Region of Capintuba
23	Communities of the Region of Severino
24	Communities of the Region of Taciua
25	Communities of the Region of Boca do Arauá
26	Communities of the Region of Madeira
27	Communities of the Region of Cacaia-Barraquinha
28	Communities of the Region of the Upper Mariepauá
29	Communities of the Region of Cachoeira
30	Communities of the Region of the Lower Mariepauá

Appendix IV: Regression Output

Level of satisfaction versus Distance to Boa Frente, Monthly income from sales of agriculture and forest products, Monthly household expenditure, Size of household (people), Age, Years of school:

Regression Statistics	
Multiple R	0,499487553
R Square	0,249487816
Adjusted R Square	0,189446841
Standard Error	1,068300827
Observations	82

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	28,45378116	4,74229686	4,155292568	0,001170978
Residual	75	85,59499933	1,141266658		
Total	81	114,0487805			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2,358759844	0,629577617	3,746575135	0,000349806
Distance to Boa Frente	0,001696317	0,016986023	0,099865452	0,920717607
Monthly income from sales	0,001294213	0,000311429	4,155728803	8,51255E-05
Monthly household expenditure	-0,000710251	0,000636948	-1,115084785	0,268374439
Size of household (people)	-0,037523214	0,051161272	-0,733430046	0,465582608
Age	0,01878441	0,009714499	1,933646859	0,056930186
Years of school	-0,028217451	0,060776908	-0,464279148	0,643792651