



## **Local preferences for REDD+ payment formats in Brazil**

**The Bolsa Floresta Programme, RDS Rio Negro**

**Luiza Lima, Suelen Marostica and Maryanne Grieg-Gran**

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For a full list of publications please contact:  
International Institute for Environment and Development (IIED)  
80-86 Gray's Inn Road, London WC1X 8NH  
Tel: +44 (0)20 3463 7399  
Fax: +44 (0)20 3514 9055  
[pubs.iied.org](http://pubs.iied.org)

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Design by: Eileen Higgins, email: [eileen@eh-design.co.uk](mailto:eileen@eh-design.co.uk)  
Copy edited by: Holly Ashley, email: [holly@hollyashley.com](mailto:holly@hollyashley.com)  
Cover photo: Maryanne Grieg-Gran

## Poverty and sustainable development impacts of REDD architecture; options for equity growth and the environment

### About this project...

Poverty and sustainable development impacts of REDD architecture is a multi-country project led by the International Institute for Environment and Development (IIED, UK) and the Norwegian University of Life Sciences (Aas, Norway). It started in July 2009 and will continue to December 2013. The project is funded by the Norwegian Agency for Development Cooperation (Norad) as part of the Norwegian Government's Climate and Forest Initiative. The partners in the project are Fundação Amazonas Sustentável (Brazil); Hamilton Resources and Consulting (Ghana); Netherlands Development Organisation (SNV) (Vietnam); Sokoine University of Agriculture, Faculty of Forestry and Nature Conservation (Tanzania); and Makerere University, Faculty of Forestry and Nature Conservation (Uganda).

The project aims to increase understanding of how different options for REDD design and policy at international, national and sub-national level will affect achievement of greenhouse gas (GHG) emission reduction and co-benefits of sustainable development and poverty reduction. As well as examining the internal distribution and allocation of REDD payments under different design option scenarios at both international and national level, the project will work with selected REDD pilot projects in each of the five countries to generate evidence and improve understanding on the poverty impacts of REDD pilot activities, the relative merits of different types of payment mechanisms and the transaction costs.

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Luiza Lima is a forester from the Luiz de Queiroz College of Agriculture, University of São Paulo (ESALQ/USP). She worked for three years at the Amazonas Sustainable Foundation (FAS) in the area of international cooperation, research and public policy linked to REDD+. In 2012, she began work as an independent consultant but returned to the communities of Rio Negro to contribute to this research. Luiza has recently become a researcher with the Climate Change and Environmental Services Programme at the Institute for Conservation and Sustainable Development of Amazonas (IDESAM).

Suelen Marostica has a degree in forestry from the University of Brasília and a Master's degree in climate and environment from the National Institute of Amazonian Research (INPA) and is studying for an MBA with the Getúlio Vargas Foundation. She has worked on environment and sustainability issues for more than ten years. She currently works for the Amazonas Sustainable Foundation (FAS) as a coordinator of international cooperation, research and projects linked to REDD+.

Maryanne Grieg-Gran is a principal researcher in environmental economics in the Sustainable Markets Group of the International Institute for Environment and Development (IIED), London. She has over thirty years' experience in the economics of environment and development. At IIED, Maryanne has worked on numerous research projects on the economic aspects of natural resource management and ecosystem services in Latin America, Africa and Asia, including the valuation of forest resources, assessment of payments for ecosystem services and estimation of the cost of avoiding deforestation. She is the coordinator of the Poverty and Sustainable Development Impacts of REDD Architecture project.



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## Acronyms

APA	Environmental protected area ( <i>área de proteção ambiental</i> )
BFA	Association component of BFP ( <i>Bolsa Floresta Associação</i> )
BFF	Family component of BFP ( <i>Bolsa Floresta Família</i> )
BFR	Income-generation component of BFP ( <i>Bolsa Floresta Renda</i> )
BFS	Social component of BFP ( <i>Bolsa Floresta Social</i> )
BFP	Bolsa Floresta Programme
FAS	Amazonas Sustainable Foundation ( <i>Fundação Amazonas Sustentável</i> )
FGD	Focus group discussion
IIED	International Institute for Environment and Development
PES	Payments for ecosystem services
RDS	Sustainable development reserve ( <i>reserva de desenvolvimento sustentável</i> )
REDD+	Reducing emissions from deforestation and forest degradation

# Introduction

## 1.1 Background

The REDD+ mechanism, which forms a key component of the international climate negotiations, aims to provide developing countries with positive incentives for reducing forest-related greenhouse gas emissions. From an initial focus on reducing emissions from deforestation and forest degradation (REDD), the scope of the mechanism has broadened to include reducing emissions through sustainable management of forests, conservation and enhancement of forest carbon stocks (REDD+).

Many countries with forest resources are in the process of developing national REDD+ strategies in order to be prepared for implementation once negotiations on the mechanism have been finalised. An important part of this preparation is the operation of REDD+ pilot projects at the local level to demonstrate how incentive-based approaches can work on the ground. Valuable lessons are being drawn from the experiences with these pilot projects in different countries.

One of the key challenges that these pilot projects face is how to ensure that the benefits package offered to local communities in return for their commitments to forest stewardship matches their preferences while still being realistic in terms of cost. In-kind contributions of community infrastructure may bring more rewards for less investment, particularly when adapted to the needs of small, remote communities. But even small amounts of cash payments can represent much-needed resources in a predominantly subsistence economy, allowing benefits to reach the most vulnerable community members (Grieg-Gran 2012). Many development projects have been limited in their achievements because they have failed to take into account the needs, constraints and practices of local people (Johnson *et al.* 2001). To ensure that as many people as possible participate and to enhance the effectiveness of the scheme, payment schemes in REDD+ pilot projects need to tailor their benefits packages to meet the preferences of the populations they are targeting (Mohammed *et al.* 2013).

This study explores the challenges of determining people's preferences in the context of the Bolsa Floresta Programme (BFP) in Brazil, which is one of the largest REDD+ pilot projects in the world. The BFP is a payment for environmental services programme, which offers compensation to inhabitants of conservation units who are committed to environmental conservation and sustainable development. The BFP was established by the Government of the State of Amazonas in 2007, with the aim of conserving forest resources in state conservation units and of increasing livelihood opportunities for residents of these areas (State of Amazonas 2007a). It is implemented by the Amazonas Sustainable Foundation (FAS).

## 1.2 Aim of the study

This study forms part of a Norad-funded collaborative project Poverty and Sustainable Development Impacts of REDD Architecture, which seeks to generate knowledge on how REDD+ can be designed at the national and local levels to promote positive development co-benefits such as poverty reduction and improvement of rural livelihoods. The objective of this field research was to understand how people perceive the costs and benefits of the BFP and explore their preferences for changes in the design of the programme and its distribution of the benefits between different components.

This research was carried out in the Rio Negro sustainable development reserve (*reserva de desenvolvimento sustentável* or RDS), located in the municipalities of Novo Airão, Manacapuru and Iranduba in the State of Amazonas, Brazil.



# Study area

## 2.1 Bolsa Floresta Programme

The Bolsa Floresta Programme is state policy, established in Amazonas in 2007<sup>1</sup>, with the aim of conserving forest resources in state conservation units and of increasing livelihood opportunities for residents of these areas. A few months after the law was enacted, FAS – an organisation created through a partnership between the Amazonas State Government and the Bradesco Bank – signed a cooperation agreement with the government to implement the BFP. The main justification for this agreement is FAS's ability to implement long-term activities efficiently and transparently, regardless of political and partisan interests. The institutional stability and the credibility of FAS opens new opportunities for financing the BFP through partnerships with institutions and companies committed to social and environmental engagement.

The BFP is divided into four components, three being community-based investments and one a direct payment mechanism for families. The community components – social, income (generation) and association – aim to organise benefited communities to improve basic services such as education, transport and health; to develop sustainable economic activities; and to strengthen community social organisation. Investments are decided in conjunction with the communities through periodic workshops. The family-based component, the *Bolsa Floresta Família* (BFF), is a direct compensation paid monthly to families committed to zero deforestation of primary forests.

A description of the four BFP components follows below:

- **Bolsa Floresta Renda (BFR) – income-generation component:** this is a community-level payment equivalent to R\$396.00 per family per year to support sustainable production including fruit, honey, fishing and the extraction of vegetable oils, among other activities. Investments are defined by the community, so long as the applications are legitimate.
- **Bolsa Floresta Social (BFS) – social component:** this is a community-level payment equivalent to R\$350.00 per family per year to improve education, health, health infrastructure, communication and transport – i.e. basic services to improve the living conditions of inhabitants. Government agencies and relevant institutions participate in these projects collaboratively.
- **Bolsa Floresta Associação (BFA) – association component:** aimed at residents' associations in the state-level protected areas, the equivalent annual payment from this component (equivalent to R\$60.00 per family) corresponds to 10 per cent of the amount paid to the community through the BFF. The goal is to strengthen the organisation of communities and comply with social rules and BFP agreements.
- **Bolsa Floresta Família (BFF) – family component:** a monthly payment which totals R\$600.00 per year, for mothers and wives of families who are living within conservation units and are committed to environmental conservation. This component is an important tool to involve local people in curbing deforestation and forest degradation. However, it is not expected to be the main source of income for families, merely a complementary incentive.

These four components total R\$1413.00 per year per household registered with the BFP. In addition to these four components, five support programmes have been implemented. FAS collaborates in the definition and organisation of strategies to implement and establish the necessary partnerships for each programme. The five support programmes aim to develop

1. Law no. 3.135, 5 June 2007 (State of Amazonas 2007a).

sustainable production, education and health; supervise and monitor deforestation; manage protected areas; and facilitate technological development.

In contrast to other social initiatives, the BFP has clear objectives and compensation mechanisms. These include both the BFP's commitment to zero deforestation and its support for the implementation of state-protected areas.

According to the BFP strategy, the main source of income it provides for families in the programme is not the family component, but the income-generation component. From a social perspective, the main outcome is support for better education, health conditions, communication and transport through the BFP social component. From the point of view of governance and participation, the association component is the primary tool for the empowerment of local communities.

## 2.2 Study area

The Rio Negro sustainable development reserve was created in 2008 by Law 3.355 on 26th December. As of 2009, RDS Rio Negro became the beneficiary of the BFP. This area was chosen for the study in question due to its proximity and similarity to the Rio Negro environmental protected area (*área de proteção ambiental* or APA), the area initially selected to be the pilot for this research area, and where the baseline survey was conducted. The environmental protected area could no longer be considered as the study area for the research project because it was undergoing a re-categorisation at the time of writing, with the result that BFP implementation had stalled. Another advantage of conducting the research in RDS Rio Negro is that it would enable comparison with a household survey conducted in 2010/11 in three reserves: Rio Negro, Juma and Uatumã.

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The category of sustainable development reserve allows traditional communities to reside within its boundaries but the land is publicly owned. The state government grants families concessions for use of community areas but these cannot be marketed.

As described in Box 1, the use of natural resources is permitted in accordance with the local zoning provisions set out in the management plan for the area. The Rio Negro sustainable development reserve, however, still does not have an approved management plan and in this case the commercial activities for forest products and fishing are not regulated, except when approved in specific plans. The use of resources for community subsistence is assured.

The Rio Negro sustainable development reserve has 19 communities divided into three centres with a total of 525 families. Approximately 7000 people live within its boundaries. All families are participants of BFP, with the exception of some families who have lived in the reserve for less than two years or do not possess the personal documents necessary for registration, making them ineligible for participation at this time. Figure 1 shows the demarcation of the sustainable development reserve, the location of the communities, and the centres in question.

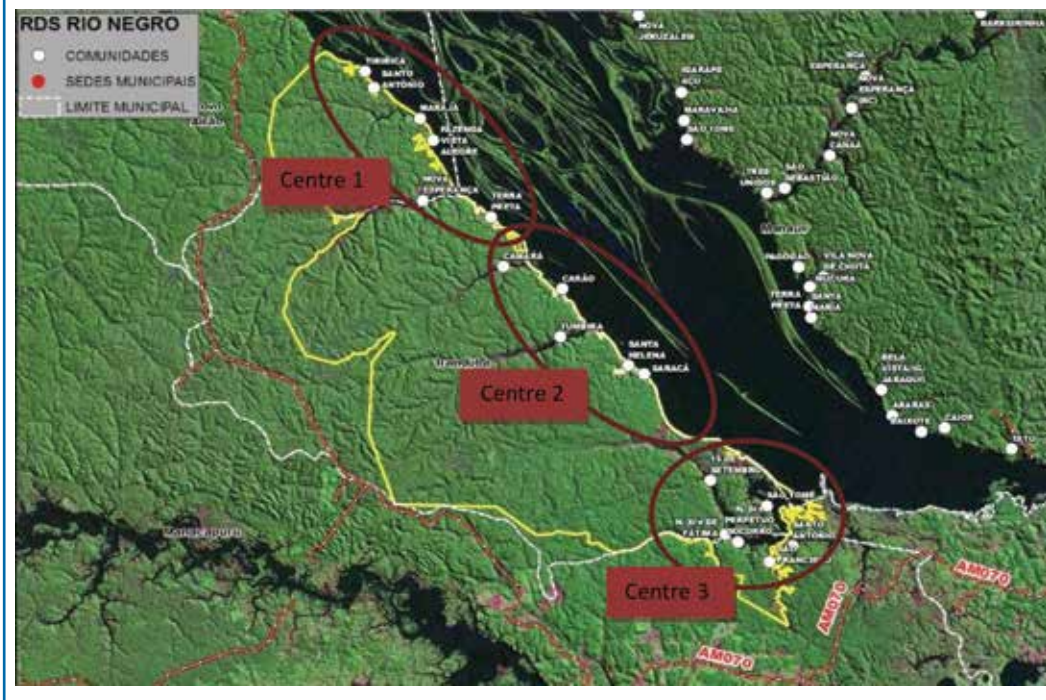
### Box 1. Definition of a sustainable development reserve\*

Art. 21. The Sustainable Development Reserve is a natural area which houses traditional communities whose existence relies on sustainable systems of natural resources use, developed over generations and adapted to local ecological conditions, and which play a key role in protecting nature and maintaining biological diversity.

- 1. The basic aim of the Sustainable Development Reserve is to preserve nature and, at the same time, ensure the conditions and means necessary to reproduce and improve the way and quality of life and the management of natural resources by traditional communities. It also aims to enhance, conserve and improve the knowledge and techniques of environmental management developed by these populations.
- 2. The Sustainable Development Reserve is in the public domain, allowing particular areas included in its boundaries to be expropriated, by law, when conflicts occur between the owner and communities or between owners and public authorities, for disrespect on the part of the owner for the management plan or regulatory standards, or in the occurrence of endemic, rare or endangered species, that require use to be restricted.
- 3. The use of areas occupied by traditional communities shall be governed in accordance with the provisions of article 75 of this law.
- 4. The activities carried out in the Sustainable Development Reserve will obey the following legislation:
  - i) public visitation is permitted and encouraged, so long as it is compatible with local interests and in accordance with the provisions of the management plan for the area;
  - ii) the Sustainable Development Reserve's management plan, approved by the board of directors for the unit, should consider the dynamic equilibrium between the population size and conservation, and define the areas for integral protection, sustainable use, buffer zones and ecological corridors;
  - iii) the management of natural ecosystem components under sustainable management and the replacement of vegetation cover by cultivated species is allowed, as subject to zoning, legal constraints and the area's management plan;
  - iv) all fishing modalities, except subsistence, can only be exercised upon approval of specific projects by the Deliberative Council for the Sustainable Development Reserve.

\* Translated from source: State of Amazonas (2007b).

Figure 1. Map of the Rio Negro sustainable development reserve





# Methodology

## 3.1 Exploration of costs and benefits

A common approach to assessing the costs and benefits for participants of PES interventions like the BFP is to examine the cost implications of what they give up by being in the scheme and compare this with the payments. The focus is often on estimation of the opportunity cost of the agricultural land use forgone. If participants agree to desist from clearing primary forest for agriculture they are giving up the benefit of agricultural production on the land concerned. For example, the payment level for forest conservation in the national PES scheme in Costa Rica was based originally on the opportunity cost in the form of the rental price of pasture (Porrás *et al.* 2012).

For a number of reasons, however, this apparently simple approach does not seem appropriate in the case of RDS Rio Negro. Estimating the opportunity costs of agricultural returns forgone is not straightforward as estimates are highly dependent on assumptions made about the costs of own labour, land productivity and discount rates (Grieg-Gran 2008). The opportunity cost of agriculture is only a partial indicator of the costs, particularly where people have several livelihood options. An alternative approach to estimating opportunity costs is to examine land prices as these in a well-functioning market are equal to the net present value of the stream of net returns over time of the land in its most productive use. In the case of the RDS Rio Negro, such an approach would not be appropriate as the land is publicly owned and therefore sales of land between individuals are not legal. Even if it were possible to get individuals to disclose details of illegal transactions, the prices obtained in this way would not be representative of a well-functioning market. Transaction costs for the participants have to be considered also.

Benefits for an incentive programme like the BFP – offering a complex package of benefits rather than a single payment – do not lend themselves to a simple comparison with costs, and a number of less tangible benefits have to be considered also. A further challenge is to establish a reference point against which to assess the changes. The complication in this case is that with the creation of the sustainable development reserve, a number of restrictions on land and resource uses were introduced. The rules of the BFP, which was introduced shortly afterwards, were no more restrictive. As a state public policy, the BFP was created with the objective of supporting implementation of conservation units and bringing improvements to the quality of life for people who already inhabited these areas, in order to reduce the impacts of increased restrictions on access to forest resources and on commercialising forest products in the sustainable development reserve. The effect of this intertwining of the RDS and the BFP and the latter's role in reinforcing the former is to make attribution difficult both on the part of the participants in the programme and the researchers.

In view of these challenges, the approach adopted was to explore the perceptions of the costs and benefits of the BFP in focus group discussions. The idea was to give the participants the freedom to identify costs and benefits by themselves, to make qualitative assessments of the magnitude and, in particular, to identify non-tangible costs and benefits, such as reduced risk. Adopting the techniques of a memory game and the participatory construction of timelines in the discussion groups facilitated recall on the part of the participants and helped them to separate the impacts of the BFP from those of the RDS.

## 3.2 Examining preferences

In examining preferences for different aspects of payment design, it is important to identify not only what people prefer but also the factors influencing their choices. This enables conclusions to be drawn about the generalisability of the results – that is, whether they are likely to apply in other communities or whether they are a special case. One way of doing this is to explore with people in focus group discussions what they prefer and why. The advantages of the group-based approach have been demonstrated in a study of people’s views about PES in Cat Tien, Vietnam (Petheram and Campbell 2010). It enables some deliberation within the group so that members can make their decisions about preferences on a more informed basis and gives them the scope to change their opinion in the course of the discussion. It also enables open-ended discussion about why people prefer particular options. In the Vietnam study, for example, the discussions revealed that participants wanted very frequent payments because of their difficulties in handling money (Petheram and Campbell 2010). The disadvantage of a group-based approach is that the views of some members of a group may predominate and not all voices may be heard. Much depends though on the skills of the facilitator. There is also the issue of representativeness – detailed information may be obtained about some groups but this may not be representative of the whole area.

An alternative approach is to conduct a household survey to ask people about their preferences and their personal characteristics. Statistical analysis can be used to explain the choices people make by relating them to key factors such as their personal characteristics. The basic idea is that preferences for specific goods or services, or in this case payment packages, depend on two main factors: (a) the personal characteristics of the respondent and (b) the characteristics of the goods or services in question. This approach, known as the discrete choice method, was initially developed in marketing and transport economics (e.g. see Louviere *et al.* 2008) and has been extensively used to estimate the economic value of ecosystem goods and services. With this method, individuals are presented with a choice set (or series of choice sets) that are framed with various attributes and attribute levels and are asked to choose one bundle at a varied set of attribute levels (Mohammed *et al.* 2013; Chung *et al.* 2011). As this requires respondents to make trade-offs by giving up something for each increase in an attribute level, there is less scope than in more open-ended discussions or questions for strategic responses (Mohammed *et al.* 2013; Alpizar *et al.* 2001).

Simple descriptive statistical analysis can explore issues such as how the proportion of respondents preferring a particular alternative differs according to their gender, or their main source of income. More sophisticated forms of analysis, such as the multinomial logit model, can develop a probability function to estimate the probability that a person with specified characteristics chooses a particular alternative or to examine how people’s choices will change with changes in the attributes of the alternatives or changes in their personal characteristics.

Such a survey was carried out in the Rio Negro reserve and two others (Juma and Uatumã) in 2010–11 with a sample size of 463 (156 in RDS Rio Negro). The advantage of the survey approach is that it can be based on a random sample, ensuring greater representativeness. The disadvantage is that a large sample is needed so that it can be costly.

For this study, a combination of a group approach and individual surveys was used. Focus group discussions were held to explore people’s views on the different components of the benefits package of the BFP. Within these discussions, individual questionnaires were given to group members to fill out.

### 3.3 Methods for information collection

#### 3.3.1 Selection of the communities

The selection of the communities for conducting research was done in such a way as to be as representative as possible, taking into account the short time available for field activities. Thus, it was decided on the basis of logistics that discussions would be organised in six communities, with two from each centre. Within each centre, the communities selected for sampling were large and small, enthusiastic and not enthusiastic about the Bolsa Floresta Programme and relatively diverse in terms of income-generating activities. Selected communities are presented in Table 1 below, as well as the number of individuals and families living in each community, the number of participants in the focus group discussions, and the main income-generating activities developed.

Table 1. Communities selected for focus group discussions with key social indicators<sup>2</sup>

Communities	Population		Focus groups		Main cash-generating activities
	Residents	Households	Participants	As % residents	
<b>Centre 1</b>					
Nova Esperança	170	42	8	5%	Timber and fishing
Tiririca	54	17	12	22%	Timber and crafts
<b>Centre 2</b>					
Santa Helena do Inglês	65	18	12	18%	Timber, fishing and crafts
Terra Preta	251	64	12	5%	Timber
<b>Centre 3</b>					
Nova Aliança	52	14	8	15%	Agriculture
São Tomé	62	19	12	19%	Tourism and crafts
<b>Total</b>	<b>654</b>	<b>174</b>	<b>64</b>	<b>10%</b>	

Given that the size of the discussion groups was relatively fixed – the intention was that they should have from 8 to 14 participants – this meant that Centre 3 had greater representation, since there were fewer residents in these communities than in the other two. Another important factor was that in a few cases, there was more than one participant from the same family.

#### 3.3.2 Approach to conducting the FGDs

Having previously been advised and accompanied by a member of FAS and the president of the Rio Negro Sustainable Communities Association, contact was made with the local leader on arrival in the community to invite those who were interested to join in with the discussion, so that there were between 8 and 15 participants.

A schedule to be followed in each of the communities was set, so that the activity had an average duration of two hours. In this way, there was time to discuss some points in greater depth, but the activity was short enough that participants did not either lose concentration or have to leave the group before the end.

Activities began with a presentation by the team conducting the session, explaining the purpose of the research and how it would be carried out. In most cases, introducing the participants to each other was also encouraged.

2. This information was obtained from the first of the FAS community surveys which was done at the beginning of the programme implementation and subsequently corroborated by other surveys (Viana *et al.* 2013).

Figure 2. Focus group discussion in Terra Santa



### 3.3.3 Costs and benefits of the BFP

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Discussions began with the benefits and costs of participating in the Bolsa Floresta Programme. The Rio Negro sustainable development reserve was created in 2008. In 2009, the BFP began. In the four subsequent years, what changes had the communities experienced in their lives? Were these changes related to the BFP? Were they positive or negative changes?

The initial idea was to start with a memory game. Participants were divided into groups to reflect back to when the BFP began and consider the benefits that they have received since then. This methodology, however, was adjusted after the second community visit to facilitate the participants' recall of developments since the beginning of the programme. The activity continued, therefore, with the participatory construction of two timelines. On the first, only the creation of the sustainable development reserve in 2008 was marked, and the participants were prompted to think about changes that the reserve had brought and what their life would have been like without the BFP.

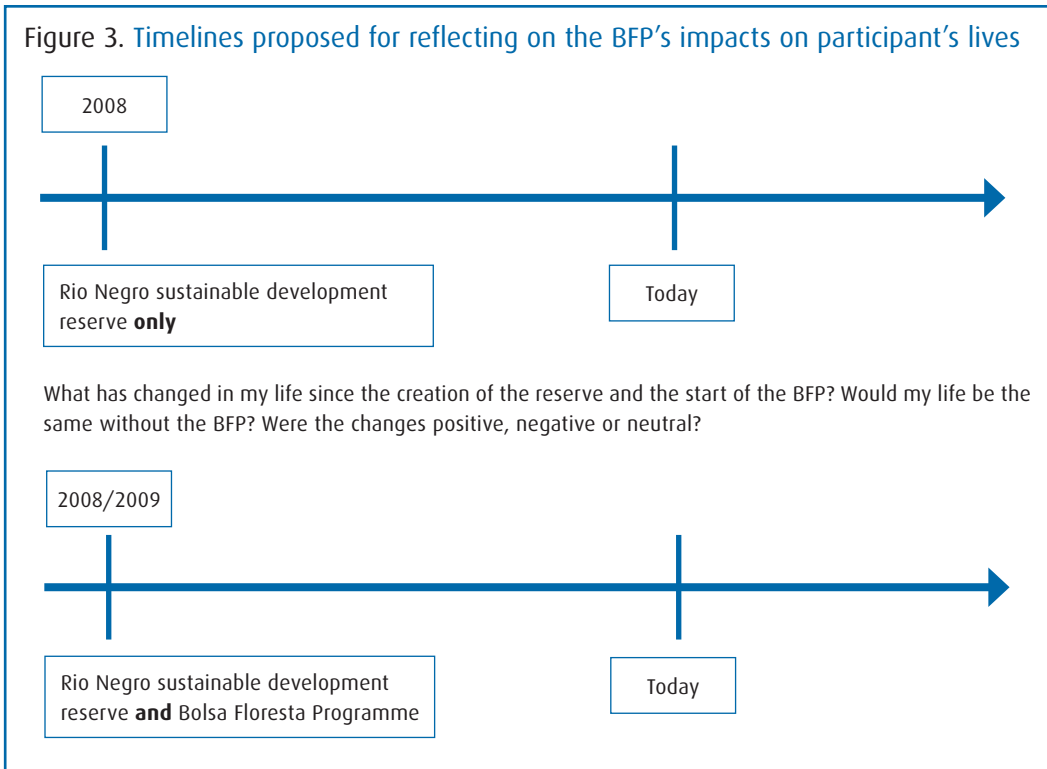
On the second – or 'real' – timeline, participants were then asked to list the benefits they had received from the BFP, beginning with the family component and then the social and income-generation components.

Figure 3 illustrates these two timelines. From the general construction of these timelines, the level of change that the BFP brought about can be assessed, estimating its eventual additionality in terms of socio-environmental benefits.

This initial activity enabled participants to list the most relevant benefits which they had already received and the positive and negative points of participating in the BFP. It was also carried out with the goal of making participants feel more comfortable with the research process.

To conclude this step, four of the communities were asked to give a general score to the BFP. Each individual participant was encouraged to rank the BFP with a score of one to ten. So that responses could be free and open, individual forms were distributed to each participant, which were then given back to the team facilitating the activity. The facilitation team helped any illiterate participants to fill out the questionnaire. The scores were then collated and fed back to the group.





### 3.3.4 Payment formats

Information on the socio-economic characteristics of the participants was collected at the beginning of the FGD. Individual socio-economic questionnaires were given to participants and their content was explained. Again, the facilitation team helped any illiterate participants to fill out the questionnaire (Figure 4).

After the discussion on costs and benefits, participants were given the opportunity to choose between five different benefits packages: a status quo package and four hypothetical alternatives to the current BFP benefits packages. Each alternative involved the same amount of money for each household when combining the direct payments of the family component with the average amount imputed each household for the social, income-generation and association components. The difference between the alternatives was in the distribution of the average funds per household between the four BFP components. As shown in Figure 3, package 5 increased the family component but reduced the amount allocated to the income-generation and social components, so that the overall amount remained the same as in package 1, the status quo.

These package scenarios were based on ones used in a previous survey carried out in RDS Rio Negro in 2010–11 (see Mohammed *et al.* 2013). There would have been advantages in constructing a set of scenarios in a more participatory fashion, based on the discussions with the communities. However, this could have resulted in different scenarios being examined in each group or in packages that were unrealistic from the viewpoint of FAS. The decision was taken therefore to base the formats on those used in the previous survey as these had been formulated by FAS and were considered by it to be technically and financially plausible (Mohammed *et al.* 2013). This also had the advantage of allowing for comparisons between the two surveys.

Forms with a simplified version of Figure 3 were distributed to the participants. Before the participants were asked to indicate their choices, an explanation of the exercise was given and repeated several times, to guarantee everyone fully understood it. It was also highlighted at

various points that this was a hypothetical exercise, in order not to raise expectations that the study would in fact result in changes to the BFP benefits package.

Participants were asked to fill out the forms as if it were a secret ballot to ensure that other people's opinions did not influence their individual decisions. Again, for those group members who were illiterate, the facilitators helped them to fill in the forms.

Figure 4. Nova Aliança: facilitators assist participants to fill in questionnaires



Photo: Cleide Lima

Participants were first asked to indicate the alternative that they liked best. They were then asked to indicate their second preference. The final question asked which component out of the social, income-generation and association components should be prioritised for increased investment. The aim was to examine how participants regarded the community-level benefits when not required to make trade-offs between these and the family component.

After one round of voting, the forms were handed in and a discussion was held on the results and the reasons why people voted in the way they did. The initial plan following the methodology proposed by IIED was to do the voting exercise three times. This idea had to be dropped because of the time this would have taken and a fear that group members would disperse before the final discussion of the results.

Table 2. Hypothetical alternatives for different arrangements of BFP

Alternative packages		Bolsa Floresta Programme component (in R\$)			
		Income	Social	Association	Family
1	Status quo option (no change)	395.80	350.00	67.20	600.00
2	Reduce BF social component by R\$100 to invest in BF income component, without changing BF association or family components	495.80	250.00	67.20	600.00
3	Reduce BF income component by R\$100 to invest in BF social component, without changing BF association or family components	295.80	450.00	67.20	600.00
4	Reduce BF income component by R\$50 and BF social component by R\$50, to be invested in BF association component	345.80	300.00	167.20	600.00
5	Reduce BF income component by R\$50 and BF social component by R\$50, to be invested in BF family component	345.80	300.00	67.20	700.00
a)	Please choose your first preferred alternative: 1( ) 2( ) 3( ) 4( ) 5( )				
b)	Please choose your second preferred alternative: 1( ) 2( ) 3( ) 4( ) 5( )				
c)	Please indicate which of the three options below you think should receive more investment: Social ( ) Income generation ( ) Association ( )				

# Results and discussion

## 4.1 Respondents' profiles

A total of 64 people were involved in the focus group discussions, split roughly equally between men and women. Their ages ranged from 18 to over 61 and they were fairly evenly divided between age categories, with 28 per cent aged between 18 and 30; 33 per cent between 31 and 45; and 28 per cent between 46 and 60. The least-represented age category with 11 per cent of participants was the over-61 group.

Education levels were fairly low. Nearly a quarter of participants had no formal education, just over half had elementary education only and only 13 per cent of participants had completed high school. In Centre 2, the proportion of group participants with no education was particularly high, at 46 per cent. This reflects the lack of educational facilities in the region. Until the construction of the conservation and sustainability centre in the Tumbira community (Centre 2), youth in the sustainable development reserve could only attend school until elementary level. If they wanted to continue their studies, they would have had to leave the region and move to an urban centre.

Income levels ranged from less than R\$60 per month per capita (equivalent to US\$1 per day) to over R\$800 per month per capita (equivalent to US\$13 per day) but the majority of participants (81 per cent) were within the range of R\$65 to R\$450 per month. Almost all group participants (98 per cent) earned less than the minimum wage. The two most common main sources of income over the whole sample were social benefits and paid work, each corresponding to 25 per cent of the sample. Harvesting of timber and other forest products (13 per cent) and agriculture (11 per cent) together corresponded to another 24 per cent of the sample. Tourism was the main source of income for 8 per cent of the sample but these respondents were all from one community (São Tomé). The most common secondary source of income for the respondents was agriculture, with 23 per cent of responses, followed by social benefits, with 20 per cent. Harvesting of timber and other forest products was identified as the second major source of income by only 11 per cent of participants, less than for fishing (16 per cent).

What is striking is how few of the respondents considered timber/forest products harvesting or agriculture to be their primary source of cash income. Families are highly dependent on income from activities not linked to land use – such as remuneration in wages – and social benefits. In Brazil, one of the major federal policies for the eradication of poverty is the Bolsa Família Programme, which makes a direct transfer of income to families with per capita income below R\$140 per month (Paiva undated). Many families in these communities receive resources from this programme. Retirement pensions for the elderly are also an important source of income in the area.

A comparison with the characteristics of respondents to a survey conducted by market-research company Action Pesquisa in 2010–11 suggests that the participants in the focus group discussions in these six communities are unusually dependent on social benefits and paid work (Action Pesquisa unpublished). This earlier survey found that 25 per cent of respondents in the RDS Rio Negro considered these two sources of income to be their main income source (half the proportion in the six community focus groups) while 44.2 per cent considered agriculture to be their main source of income (four times the proportion found in the six community focus groups). The Action

Pesquisa survey also found that an even lower percentage (4 per cent) of participants in the programme in Rio Negro was engaged in harvesting timber and other forest products as their main income-generating activity. These differences from the earlier household survey may reflect the presence of more than one member of the same family in the discussion groups. The differences in these social profiles potentially limits the extent to which the results can be generalised to the whole of the RDS Rio Negro and makes it important to examine how perceptions and preferences are related to the socio-economic characteristics of the group participants.

## 4.2 Perceptions of the costs and benefits of the BFP

### 4.2.1 Perceptions of benefits

The clearest benefits the group members perceived that could be attributed to the BFP were the investments in the social and income-generation components. Opinions differed both within and between the groups as to which of these investments was most important and the importance of these investments compared to the family component. In three of the six groups (Tiririca, Nova Esperança and Santa Helena do Inglês) there was consensus that the social component investments were the most important as they benefited everyone in the community. For example, in Nova Esperança, the ambulance boat was cited as an example of a community-wide benefit that had already been used several times. In the other three groups, some of the members took this view, but others disagreed.

Figure 5. Nova Aliança: the social centre, financed by the BFP social component, where the discussion was held



Photos: Luiza Lima

In Nova Aliança, the argument was made by some group members that the income-generation investments were very important (Figure 5). While these investments currently involved only a few people in the community (for example a poultry-keeping activity – see Figure 6) this component would come to benefit more people in subsequent years as other types of income-generating investments were selected. In the other two communities (São Tomé and Terra Preta), a large part of the investments selected had not yet reached the operation stage; the community was either awaiting delivery of materials or was in the process of constructing the facilities. This was reflected in the two group discussions, with concerns expressed about the delays in the delivery of materials (both groups), difficulties in reaching consensus within the community on the investments to select (São Tomé) and about the need to compensate community members for the time they spend in construction of the social and income-generation facilities (Terra Preta).

The family component was mentioned specifically as an important benefit by some members in three of the groups. For cash-strapped households in Nova Aliança, this cash payment was considered to be 'almost a minimum wage' (despite being substantially lower than the real

Figure 6. Nova Aliança: investment in poultry keeping with finance from the BFP income-generation component



Photos: Luiza Lima

minimum wage) and was used to buy cooking gas and chicken as well as paying the community association membership fee. In São Tomé, this component was considered to be most important, as each family has autonomy in using these funds. In Santa Helena do Inglês, it was thought that the payment, though small, still helped and was better than nothing.

It appears that the income-generation activities supported by the BFP were not sufficiently advanced in these six communities for people in the groups to form a consensus view about their benefits. In one case, São Tomé, where a tourism activity was already in operation (see Figure 7), this was not due to the income-generation component of the BFP but primarily due to other factors, specifically a TV show which accompanied the construction of a hostel as well as the opening of the Manaus Iranduba Bridge. But some group members argued that the BFP had helped to boost business through recommendations from FAS to visitors. Other perceived benefits in some of the groups related to the forest management plans – in Tiririca, they were now selling legal timber and so were not subject to the high risk of being caught doing illegal logging, but there were also downsides as discussed below in the section on costs.

Some less tangible benefits were identified also. One group (Santa Helena do Inglês), after some discussion about the delays in the investments in income-generation activities, identified an improvement in social organisation of the community as a benefit. They were now better able to discuss and define the investments they wanted to make. Another group (Nova Esperança) cited the benefit of being more visible to organisations working in the area. Now they did not feel as though they had been forgotten about.

Figure 7. São Tomé: tourist river terminal and handicrafts on sale for tourists



Photos: Luiza Lima

#### 4.2.2 Perceptions of costs

The discussion of costs focused mainly on those associated with logging/timber harvesting but there were a number of complexities.

First, it was difficult to disentangle the impact of the creation of the sustainable development reserve from the introduction of the BFP. In two of the groups (Nova Esperança and Terra Preta) there was discussion about the negative effect of the creation of the RDS in restricting logging, which made the help given by the BFP in the preparation and approval of forest management plans all the more important, and the delays in the bureaucratic process of approval all the more problematic. Second, in these groups and in others (in particular Nova Aliança) some positive effects of the RDS were also emphasised by some members. These included reduced logging by outsiders and the strengthening of their use rights to forest land and resources, as they were better protected now against invasion and land grabs. Third, there was concern in Terra Preta and Santa Helena do Inglês about the financial viability of legal logging. Some group members claimed that the costs of harvesting timber legally are considerably higher than harvesting illegally, but that there is little prospect of receiving a sufficiently higher price for the timber in the local markets to offset this increased cost.

During the focus groups, participants pointed out that there was also a cost for participating in the programme, particularly related to the social and income-generation components. The agreed procedure for these components is that the equipment and construction materials are delivered by FAS while the community members are expected to provide the labour to construct the planned facilities, in addition to allocating time for participation in workshops and other community meetings. In some communities, such as Tiririca, Terra Santa and Santa Helena do Inglês, leaving routine activities aside to devote time to these services appeared to be a hindrance, indicating an opportunity cost equivalent to the value of a daily wage, which ranges locally from R\$50 to R\$70. In these communities, it had been agreed internally that those who dedicated part of their time to constructing community income-generation and social facilities should be paid a half-daily wage from the BFP investment allocation. This agreement was in recognition that these facilities will bring benefits to them and to the community in the future.

#### 4.2.3 Overall satisfaction with the BFP

There was considerable variation in the extent of satisfaction with the BFP both within and between the groups. In the four groups where the scoring exercise was conducted, the scores showed variation between the groups, with São Tomé presenting a highly positive assessment (several members giving scores of 9 or 10) and Terra Preta the least positive, with half the group giving a score of less than five (Table 3). This was the only group, however, where there were scores given of less than five. Some qualitative impressions were drawn from the two groups where no scoring was conducted and these add to the diversity of assessments. In Nova Aliança, the group members were all very enthusiastic about the BFP with high expectations for the future. In Nova Esperança, the group believed that participating in the BFP was worthwhile but that it had not brought as many benefits as expected so some improvement was needed.

### 4.3 Preferences for payment formats

The choices made by the participants are set out in Tables 4, 5 and 6. As can be observed from Table 4, package 5, the package that involved an increase in the cash payment to individual families, was the most popular, with 63 per cent of the whole sample voting for this as their first choice. At the community level, it was the most popular option in all but one of the six communities. The exception was Nova Aliança community, in which 50 per cent of participants said they would prefer the BFP in its current form and only 38 per cent would like the family component to increase. This was the community which had showed the most enthusiasm

Table 3. Level of satisfaction with Bolsa Floresta

Community	Scoring by focus group participants
São Tomé*	Sub-group 1: 10 Sub-group 2: 9 Sub-group 3: 7
Tiririca	7 people: 5 2 people: 6-7.5 1 person: 9
Terra Preta	6 people: less than 5 3 people: 5-7 3 people: 7
Santa Helena do Inglês	7 people: 5 2 people: 6 1 person: 9 1 person: 10

Source: Focus group discussions

\*The São Tomé group decided to form three sub-groups to debate this question and give a consensus score for each sub-group rather than individual scores.

for the BFP during the discussion groups regarding the costs and benefits of participating. In contrast, the communities of Terra Santa (Centre 2) and Tiririca (Centre 3) each had a 75 per cent preference for increasing the family component. It was in these two communities, during the discussion on the costs of participating in the programme, that group members had been most emphatic about the need for daily wages for constructing benefits and other activities.

The second most popular option was the status quo option with 23 per cent of the votes, considerably less than package 5. The least popular option was package 4, involving an increase in allocation to the BFP association component. Only one participant voted for this.

Table 4. Alternatives preferred by the participants for BFP payment arrangements (n=64)

Alternatives	Communities/centres							Total
	Centre 1		Centre 2		Centre 3			
	Nova Esperança	Tiririca	SH do Inglês	Terra Preta	Nova Aliança	São Tomé		
1 No change	37.5%	0%	17%	17%	50%	33.3%	<b>23%</b>	
2 Reduce social component by R\$100.00 to invest in income component	0%	17%	17%	8%	0%	0%	<b>7.8%</b>	
3 Reduce income component by R\$100.00 to invest in social component	0%	0%	8%	0%	12.5%	8.3 %	<b>4.7%</b>	
4 Reduce income by R\$50.00 and social by R\$50.00 to invest in association component	0%	8%	0%	0%	0%	0%	<b>1.6%</b>	
5 Reduce income by R\$50.00 and social by R\$50.00 to invest in family component	62.5%	75%	58%	75%	37.5%	58.3%	<b>62.5%</b>	

These results are fairly consistent with the findings of the choice experiment in the 2010–11 survey (Mohammed *et al.* 2013). This also found an overwhelming preference (over 70 per cent) for package 5, involving an increase in the family component, with the status quo option in second place (15.7 per cent) and the least popular options being 3 (reducing the allocation to income-generation to invest in the BFP social component) and 4 (reducing the allocations to the income-generation and social components to invest in the association component).

Table 5 shows the proportion of people in the sample who voted for these different options as their second preference. In this case, the picture was more varied. In three communities, the majority of respondents voted for package 2, to increase the income-generation component at the expense of the social component. This was also the option that received the highest proportion of votes across the whole sample. In the remaining three communities, there was no single preferred option. In Terra Preta, package 1, the status quo option, was the most popular option. In Nova Aliança, it was package 5 (increasing the cash payment) that received the most votes and in São Tomé this place was taken by package 4 (increasing the association component). But this was the only community that voted for package 4.

**Table 5. Second preferred options for BFP payments arrangements**

Alternatives		Communities/centers									Total
		Centre 1			Centre 2			Centre 3			
		Nova Esperança	Tiririca	Total	SH do Inglês	Terra Preta	Total	Nova Aliança	São Tomé	Total	
1	No change	0%	8%	5%	0%	58%	29%	0%	25%	15%	<b>17%</b>
2	Reduce social component by R\$100.00 to invest in income component	75%	67%	70%	67%	17%	42%	25%	25%	25%	<b>45%</b>
3	Reduce income component by R\$100.00 to invest in social component	0%	0%	0%	8%	17%	13%	13%	8%	10%	<b>8%</b>
4	Reduce income by R\$50.00 and social by R\$50.00 to invest in association component	0%	0%	0%	0%	0%	0%	0%	33%	20%	<b>6%</b>
5	Reduce income by R\$50.00 and social by R\$50.00 to invest in family component	13%	25%	20%	25%	8%	17%	38%	8%	20%	<b>19%</b>
	No response	13%	0%	5%	0%	0%	0%	25%	0%	10%	<b>5%</b>

Finally, the last question excluded the option of increasing the family component and asked participants to choose between the three community-investment components. Results are presented in Table 6. In all six communities, the majority opted to increase investment in the income-generation component, with 75 per cent of preferences averaged over the whole sample, followed by an increase in the social component (20 per cent). Only 5 per cent preferred an increase in the association component.

The proportion voting for an increase in the income-generation component was particularly high, at 92 per cent in two of the communities, Tiririca and Santa Helena do Inglês. In the latter case, there was a discussion about the reasons why so many of them prioritised income generation, since the investments agreed in this community – community forest management plans and the construction of a hostel – have not yet delivered any tangible benefits. The community forest management plans are in the process of being approved by the licensing



department of the State of Amazonas and the construction of the hostel has not yet started. When questioned about the reasons for their choice, the group members said that it was precisely because these investments did not yet have results that income generation was the component which they believed needed more investment.

Table 6. Preferences between community-based components for increased investment

Community	Nova Esperança	Tiririca	SH do Inglês	Terra Preta	Nova Aliança	São Tomé	% of whole sample
Social	37.5%	0%	8%	25%	12.5%	42%	20%
Income	62.5	92%	92%	75%	75%	50%	75%
Association	0%	8%	0%	0%	12.5%	8%	5%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Some caveats are needed about the results shown in Table 6, as 12 participants gave answers to the third question on preferences which were inconsistent with those given by them to one or more of the previous two questions. For example, in response to the first question, some participants had opted for a package involving an increase in the social component. However, when responding to the third question, they prioritised an increase in the income-generation component. It may be that they interpreted the question to be asking them for their third choice from the packages presented in the first question (Table 2) rather than to choose between the social, income-generation or association components. When these 12 respondents are excluded from the analysis the result is even more polarised, with 83 per cent of the remaining responses opting for an increase in income generation; 15 per cent favouring the social component; and 2 per cent (i.e. one person) choosing an increase in the association component.

Looking at the responses to all three of these preference questions, it can be concluded that many of the group members are interested in increases in income either through cash payments or through investments in income-generation activities. Although the social component investments were considered important in the group discussions of costs and benefits, once participants were asked to vote individually on hypothetical alternatives to the current arrangements, their preferences shifted to prioritise cash income and income generation.

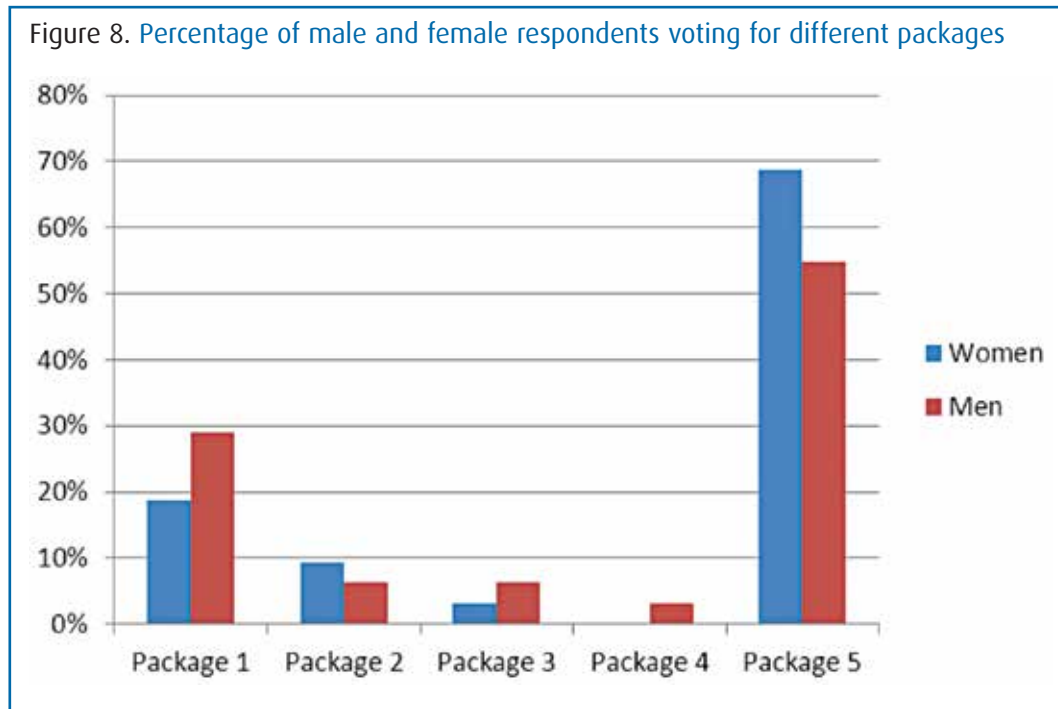
Comments that emerged throughout the discussions give an indication of the reasons why participants voted in this way: 'We're not used to working in groups'; 'I'd rather receive individually because I know that I will use the resource in the best way for my family'; 'The community benefits chosen do not benefit me or my family'. These comments may reflect the organisational form of these communities which seems more family-based than communal. Although they are small communities with few families where everybody knows everybody else and which share many common spaces, activities are carried out within family units. There is no compulsory sharing of cultivated areas or profit sharing between families. While there is a president, vice-president and treasurer to represent the community to outsiders and managing agencies, these communities seem, in structural terms, to be more similar to the Brazilian society as a whole than to traditional community groups and/or indigenous villages.

#### 4.4 Relating preferences to socio-economic characteristics

Some analysis was made of the package choices made by the respondents according to their socio-economic characteristics – in particular gender, main source of income and level of education – in order to understand the reasons for these choices.

As it is the women who receive the cash payment, it could be expected that women would be more likely than men to favour an increase in this component, even if at the expense of

other components. Preliminary analysis set out in Figure 8 gives some support to this. It shows that a slightly higher proportion of women than men voted for package 5 (which increases the cash payment) while a slightly higher proportion of men than women voted for package 1, the status quo. However, it also shows that for both men and women, package 5 was preferred by a clear majority.



The main income source might be expected to influence package choices in various ways. Those most dependent on timber and forest-product harvesting might be expected to favour the status quo or a package which put more emphasis on income-generation activities. Those less dependent on productive activities such as agriculture and timber harvesting, and more dependent on social benefits and paid employment, might be expected to favour options which increase the level of individual payment to them. However, Figure 9 shows that the main income source makes little difference to the preferences shown by respondents. For all the main income sources except tourism, the majority of respondents chose package 5, the one entailing an increase in the individual payment. A particularly high percentage of over 80 per cent of respondents with paid work as their main income source was recorded for package 5. The exception was tourism, where three of the five respondents concerned voted for the status quo and only one for package 5. All these five respondents were from the same community, São Tomé.

Education is another factor that could potentially affect choices. Figure 10, however, shows that there is little difference in the pattern of choices between those with no education, primary education and secondary education. Package 5 is preferred by the majority of respondents in each of these three education categories. This does not apply to the higher education category of respondents, but there were only three people in this category.

Figure 9. Percentage of respondents by main source of income voting for different packages

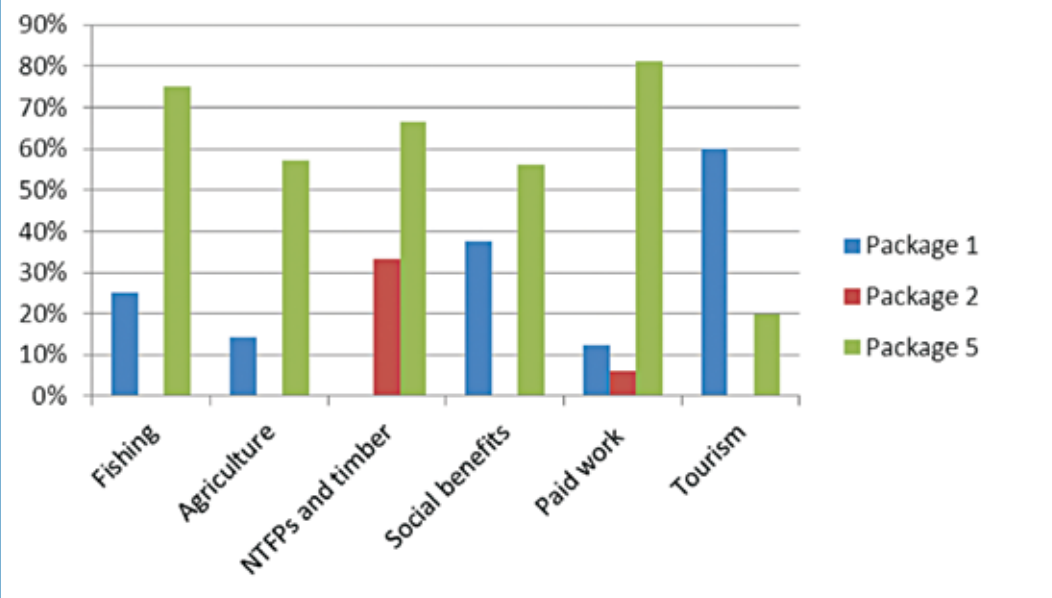
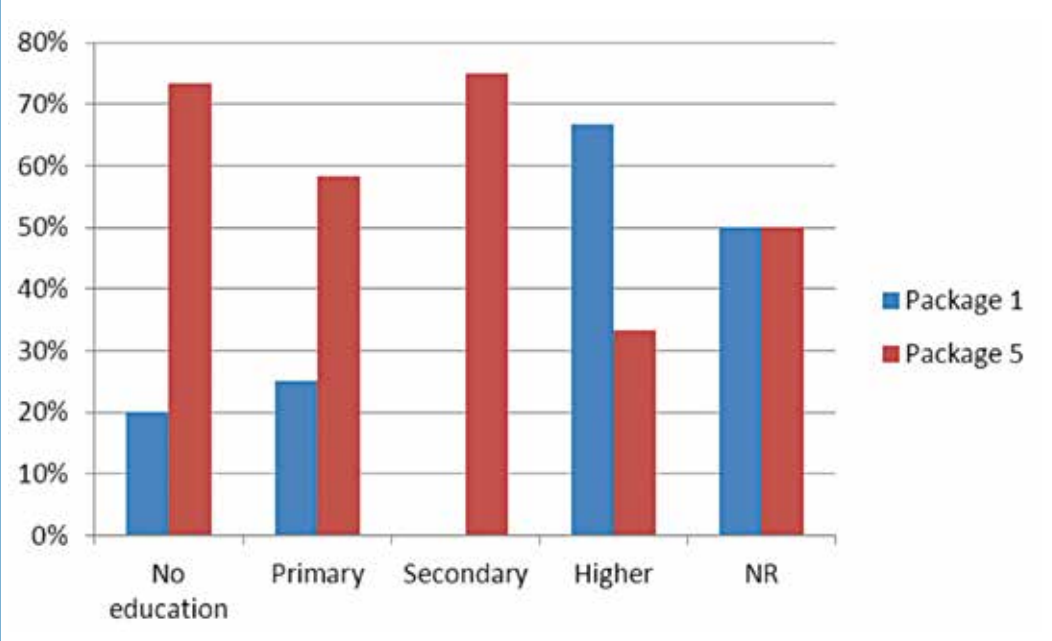


Figure 10. Percentage of respondents in each education category voting for packages 1 or 5



## 4.5 Caveats

For a number of reasons, the results need to be treated with caution. These limitations are likely to be found in most group activities where participants have a low degree of formal education. Other more visual discussions may be more preferable.

The main difficulty encountered was ensuring the active participation of all those present in the discussion groups, especially women. Attempts at dividing the group and individual encouragement of participants were not sufficient to achieve the active participation of all with the exception of the first community visited, Nova Aliança.

Another difficulty faced was the mobilisation of participants. Even though an attempt was made to notify community leaders in advance of the visit, in some communities, such as Tiririca, it took a long time to secure the participation of the required minimum number of participants. This led to delays in the schedule with the result that the meeting in the following community, Nova Esperança, coincided with the screening of a football match involving the Brazil national team. This created more challenges for securing sufficient male participation and led to a large number of those present leaving before the end of the activity.

Finally, it is possible that some of the questionnaires distributed may have been filled in incorrectly by those members with a low level of schooling and who are not used to quantifying their incomes. The facilitation team was available to assist the illiterate participants and sought to check the information on forms by verifying items not filled in or filled in incorrectly. However, when analysing the results, we noted a series of questionnaires with errors, that were incomplete or with some inconsistency.

In the analysis of the payment format results, this difficulty was even more noticeable. A high response rate was achieved – only 5 per cent of the participants did not reply to the second question – but some inconsistencies were detected in the responses some individuals made, suggesting that they may not have fully understood the exercise or that they found it difficult to identify their preferences. Two participants identified the same option as their first choice and their second choice while twelve participants gave answers to the third question on preferences which were inconsistent with the two previous questions. For example, there were a few participants who opted for an increase in the social component as their first choice (question 1) and for an increase in the income-generation component in the question which asked them to choose between the three community components of social, income-generation and association (question 3). It may be that they interpreted the question to be asking them for their third choice.

# Conclusions

This research aimed to examine the perceived costs and benefits of the BFP for participants and their preferences for changes in the rewards package using a group-based choice experiment approach. The sample was relatively small and some difficulties were experienced in ensuring the full participation of all members in the group discussions so the results need to be treated with caution. However, there are some important results which are consistent with an earlier household survey applied to a larger sample, and which can potentially provide guidance to FAS on where to focus its attention in the future and how to most effectively target its assistance.

The expressed level of satisfaction with the BFP varied considerably both within and between groups, with scores ranging from less than five to the maximum of 10. But overall, the impression was positive. The group members see the BFP as a good opportunity while recognising that there is room for improvement both on the part of FAS and their own communities.

There was a noticeable difference between how group members prioritised the different categories of benefit from the BFP that had already accrued or for which investments had been made, and how they prioritised benefits in the future from the programme. When discussing the costs and benefits of the BFP and how the programme had impacted their lives, there was consensus within three of the six groups and a strong view held by some members of the other three groups that the benefits from the social component of the BFP had been the most important. The main reason they gave for this view was that these types of social investment benefit everyone in the community.

When the groups were asked in a series of three questions about their preferences for hypothetical changes to the reward packages of the BFP, there was much less interest in the social component of the BFP and more interest in increases in the individual cash payment and the income-generation component. The majority of group members voted for the option of increasing the family component as their first preference. This choice was as an average over the whole sample (63 per cent) and in all but one of the six communities. This majority preference applied regardless of respondents' gender, level of education or main source of income – with the exception of those primarily dependent on tourism who tended to favour the status quo option more. Results were consistent with a previous survey in Rio Negro carried out in 2010–11.

When asked about their second preference from the hypothetical reward packages, the majority voted for increases to the income-generation component. A similar result was obtained from the third question which asked people to choose between hypothetical increases in investment for the social, income-generation and association components. Overall and over the three questions, the responses showed that there was little appetite for increasing the social component and very little at all for increasing investment in the association component. The main interest was in increasing family income through an increase in the cash payment or through investments in income-generation activities in the community.

There was more diversity of opinion about the benefits to date of the income-generation component. While some participants in the group discussions did consider the income-generation investments to have the most potential for benefit, the majority of group members had difficulty in identifying the benefits of the income-generation component. This is mainly because the activities are not very far advanced yet. The communities are still waiting for materials, for approval of forest management plans, or are in the process of construction.

In particular, some of the group participants were concerned about the viability of legal timber harvesting because of the increased costs involved and the apparent lack of market interest to pay more for legal timber. They did, however, see operating on a legal basis with an approved management plan as important for guaranteeing freedom and gave value to this. In one community, the attribution of income-generation benefits to the BFP was difficult because the investments in a tourism facility had resulted from other factors and the benefits from the BFP had been indirect.

One of the main objectives of the BFP is precisely to increase the income of families. The BFP is a relatively new programme and, until now, it has been in a first stage of implementation, seeking primarily the inclusion of families and the beginning of a trusting partnership between the implementing organisation and communities. In this respect, the results of this research indicate success, since the group participants, in general, approve of the BFP and, in selecting the social investments to date as the most important benefit of the programme, communities are recognising the improvements that are being introduced into their communities.

The next step in the BFP's implementation is being planned to include a better structuring of the income-generation component, which will include the preparation of business plans as a way to estimate the future returns for labour employed in an activity, and to monitor its returns once in operation. These returns will include not only tangible aspects such as revenue and profit, but also less tangible benefits to the community such as improved confidence and self-esteem in developing their own businesses. A new training series is being planned to cover business development from the drafting of projects through to business management and the establishment of indicators to measure the results.

This seems to be in line with community expectations regarding the future of the BFP. In all of the participating communities, the feeling was that it would bring further improvements. Many also took on part of the blame for certain projects' failures. This is a sign that participants understand that success in the implementation of the BFP is part of a process of continuous improvement which also depends on them, and shows a degree of perceived participatory justice where participants feel they can share the benefits and the risks.

The lack of security for the successful development of activities selected for income generation appears to be a strong factor underlying the criticism of this component and, after the preparation of business plans, FAS should evaluate whether this sentiment has changed.

Finally, the finding that the association component was seen as the least significant suggests a possible need for greater involvement of the Rio Negro RDS Association's presidency or a greater effort to actively present the association component activities and results to the other participants in the programme. It may be that the impacts of investing in the associations component will be clearly seen only in the long term.

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