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Local Participation in REDD+: Lessons from the Eastern Brazilian Amazon

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Abstract: There are concerns that local people will not be genuinely involved in initiatives to Reduce Emissions from Deforestation and Forest Degradation (REDD+). We analyzed local participation in the design of one REDD+ project in the eastern Brazilian Amazon, and assessed local hopes, worries and recommendations for the project through four community focus groups and interviews with 137 households at the site. Our results showed that only one-third of households interviewed (31%) had enough information about the project to describe it accurately. Of those, the majority (60%) hoped that the project would improve their incomes, followed by improving their agricultural production (33%) and helping protect forests (26%). While increasing household incomes was the dominant hope, people's recommendations revealed that they favored non-monetary forms of compensation over the direct cash payments included in the proponents' package of incentives. Their main recommendation was that the project should help improve their production systems through access to technical assistance, machinery and training, while valuing local production systems (46%). Our study highlights the need for participation that goes beyond passive consultation with local people to develop REDD+ interventions that best reflect local knowledge, land use practices and aspirations.

Keywords: deforestation; degradation; climate change mitigation; safeguards; livelihoods; participation; equity; benefit sharing

1. Introduction

Initiatives to Reduce Emissions from Deforestation and Forest Degradation and enhance forest carbon stocks (REDD+) have been proposed as an effective way to mitigate global climate change through interventions in developing countries. It is estimated that REDD+ could eventually impact 1–1.6 billion people who directly depend on forests for their survival [1]. Although the main focus of REDD+ is to reduce carbon emissions from conversion of forests, REDD+ is also promoted as a way to strengthen livelihoods of local communities and support other social and environmental co-benefits through new income flows from the commodification of forest carbon. Despite its promise, there are concerns that REDD+ will not respect local land rights and livelihoods [2,3] and that benefits will not get to local communities [4]. Even promoters of REDD+ recognize its clear risks, such as depriving communities of local development objectives and eroding cultural conservation values, and they stress the importance of taking into account local complexity when designing interventions to minimize such risks [5]. Yet, practical concerns remain, including how local complexity will be taken into account in the design and implementation of REDD+ initiatives, and if REDD+ interventions will reflect the aspirations and needs of local people.

To address these concerns, the common sense recommendation is to involve local people in REDD+ decision-making and implementation. The need for local people's participation in REDD+ is made explicit in the UNFCCC Cancun Safeguards and in various other REDD+ safeguard standards [6,7], including the "REDD+ Social and Environmental Standards" [8], the UN-REDD Social and Environmental Principles and Criteria [9], and the Brazilian "Social and Environmental Principles and Criteria for REDD+" [10]. The safeguard principle of access to information links to the very basic right of free, prior and informed consent (FPIC) regarding interventions to indigenous lands and natural resources, which is acknowledged in international law. Although safeguards are a very important starting point toward equitable and fair outcomes, it remains to be seen if they can truly influence REDD+ design and implementation.

It is highly challenging to realize full and effective participation, and there is much evidence that past conservation initiatives have failed to engage local people in a genuine way [11,12]. For instance, command and control initiatives, such as the implementation of strict protected areas, have often alienated people who have lived in and/or relied on these areas for their livelihoods prior to protected area establishment [13]. Additionally, despite the win-win focus of Integrated Conservation and Development Projects (ICDPs), in practice they often failed to enhance local livelihoods and meaningfully involve local people in decision making [14]. In many cases, the conservation organizations that designed and implemented ICDPs did not understand the local context and therefore did not aim to strengthen local organizations or support clarification of local land tenure rights [15]. Finally, while there have been fewer examinations of local participation in more recent Payment for Environmental Services (PES) programs (e.g., [16,17]), deficiencies are not uncommon. For instance, Corbera *et al.* [16] analyzed four PES projects in different countries (Guatemala, Nicaragua, Mexico and Belize), and in all cases found a lack of local participation in the projects' design and implementation. Despite these shortcomings, many subnational REDD+ initiatives have evolved to look like a hybrid of past ICDPs and more recent PES interventions [18], and there are thus clear risks that local people will not have a say in how such initiatives progress.

As concluded by Ribot and Larson [19], recent discourses on participation and democracy in forest policies and programs seldom reflect local forest users' needs and aspirations. Such disconnect happens because participation can mean very different levels of engagement, including the most basic passive participation that only involves informative or consultative approaches [11]. In many cases, organizations present their already formed ideas to local stakeholders and call it “a participatory process,” even though there may be very limited opportunities for dialogue and even clear disparities in access to information and power that result in coercive consensus (see [20]). Therefore, there is need for more research that examines the social aspects of REDD+ on the ground. While many REDD+ initiatives focus on areas managed by local communities or smallholders, there has been relatively little field-based examination of local perspectives and/or participation in REDD+ (some exceptions are: [21–24]).

As part of the Global Comparative Study on REDD+ (GCS-REDD+) of the Center for International Forestry Research (CIFOR) [25], we examined local peoples' involvement in one pilot REDD+ project in the Transamazon region of the eastern Brazilian Amazon. Our first objective was to analyze the participation of local people in project design. Our second objective was to understand how local community members perceived the package of incentives to reduce deforestation initially adopted by the project proponent (the Amazon Environmental Research Institute; IPAM), through analysis of local hopes, worries and recommendations. The research draws on both quantitative and qualitative information gathered from household interviews and meetings with community members in the project area.

2. Study Site

The study communities are located on adjacent roads along the Transamazon Highway (BR-230) in the rural areas of the municipalities of Anapu, Senador José Porfírio and Pacajá in the State of Pará—Brazil (Figure 1). Until the 1970s, the region was occupied primarily by indigenous and mixed descendants of Amerindians, Portuguese and Afro-Brazilians (known as *caboclos*) [26], who generally engage in subsistence economies that are based on fishing, hunting, extractivism, swidden agriculture and agroforestry [27]. However, from 1970 to 1974, the Brazilian federal government launched the National Integration Plan, which led to the massive construction of roads and the settlement of small colonist farmers [28]. The military government justified the plan by the need to integrate the Amazon with more developed, southern Brazil and to relocate landless people from overpopulated areas to the Amazon, which was viewed as an empty space [29,30]. The main project promoted by the integration plan was the construction of the Transamazon Highway and colonization along its margins. While the initial idea was to create 8,000 km of paved road to connect the Brazilian north and northeast region with Peru and Ecuador, the highway is currently a 4,965 km stretch of mostly unpaved road between the Brazilian states of Paraíba and Amazonas [31].

The Brazilian government promoted the Amazon as the land of opportunity, and families from all over Brazil, especially from the northeast, migrated to this new frontier area. To regularize the land occupation of these new settlers, the federal government created the Agency for Colonization and Agrarian Reform (INCRA). The government expected that while the new farmers would first produce food crops for subsistence, they would eventually produce a surplus for export to southern Brazil. They

offered farmers incentives to settle in the region, including land, a six-month salary and access to credit [26]. The Transamazon highway opened in only three years (1971–1973), but by 1975, the state reneged on its promised investments in the small settlements in favor of large-scale cattle ranching, forestry and mining [28]. The government interrupted the colonization of small farmers and abandoned settlers in a precarious situation with lack of public health services, education and transportation.

Figure 1. Map showing the communities sampled. Map credit: Uji Astrono Pribadi.



During the 1980s, the Catholic Church played an important role in helping settlers organize themselves to demand government support, improve their agricultural practices and build more viable production systems. The leaders of this movement later formed the non-governmental organization (NGO), the *Fundação Viver, Produzir e Preservar* (FVPP) [32]. In the 1990s, FVPP implemented training programs for farmers' children and secured international donations, such as funds from the World Bank Pilot Program to Conserve the Brazilian Amazon. FVPP was also involved in the construction of *Proambiente*, one of the first PES-like pilot initiatives in Brazil.

Proambiente was a federal pilot program designed to conciliate smallholder production with natural resource conservation through land use planning, technical assistance and PES. *Proambiente's* implementation in the Transamazon was led by FVPP with IPAM as a key partner in select activities. In the Transamazon, 350 families participated in *Proambiente* from 2003 to 2006, with participating households receiving payments over a six-month period. Families were selected to participate based on two main criteria: membership in a representative organization (mainly the rural workers union) and, interest in adopting agroecological practices [33]. *Proambiente* ended prematurely, however, due to the absence of national regulations for PES, insufficient funding, low implementation capacity, little collaboration between different sectors, and incompatibility of the program with regional development

policies [34]. To provide continuity to this initiative, FVPP and IPAM proposed a REDD+ pilot project called “Avoided Deforestation on Small Rural Properties in the Transamazon region,” which targeted the same 350 families that participated in *Proambiente*.

The goals of the REDD+ project were to provide a package of incentives for small farmers to conserve standing forests by increasing agricultural productivity in already deforested areas and reducing deforestation for shifting agriculture and extensive cattle ranching. This incentive structure was part of a plan that involved three main strategies: (i) payments for avoided deforestation; (ii) investments for a transition to more sustainable production activities; and (iii) deforestation monitoring [35]. The first strategy consisted of direct cash payments for families commensurate with the opportunity costs of avoided deforestation, which proponents calculated as 103.70 USD per ha/year [36]. This payment value corresponded to the estimate that on average households deforest 2.39 ha/year and therefore would receive 248 USD in the first year (average 20 USD per month). This value would increase annually in relation to the amount of avoided deforestation [35]. The second strategy involved incentives to improve agricultural practices and intensify production (e.g., through capacity building, technical assistance and provision of inputs), strengthen local organizations and improve infrastructure. The third strategy combined deforestation monitoring via remote sensing with on-the-ground monitoring by community members [35]. Similar to other subnational REDD+ initiatives in the Brazilian Amazon, this package of interventions represents a mix of regulatory and incentive-based mechanisms [37], and includes both ICDP and PES elements [18].

In 2010, the Brazilian National Development Bank (BNDES) pre-approved the project for Amazon Fund support on the condition that it be expanded to include a larger number of families. Therefore, the project proponents added three more land reform settlement areas where they plan to promote alternative livelihoods, while maintaining the original three-tiered project structure for the 350 *Proambiente* families in the Transamazon region. The final project was approved in 2012 and renamed “Sustainable Settlements in the Amazon: the challenge of the transition from frontier family production to a low carbon economy.”

3. Research Methods

CIFOR’s GCS-REDD+ is a multi-year research project (2009-2015) that aims to evaluate the effectiveness, efficiency, equity and co-benefits of REDD+ design and implementation. Part of this study consists of empirical research on 23 subnational REDD+ initiatives in Brazil, Peru, Indonesia, Vietnam, Cameroon and Tanzania through a counterfactual BACI (before-after/control-intervention) approach. This approach compares communities that are the target of REDD+ interventions with communities that are not, before and after implementation. In this paper, we present results from the before phase in four intervention communities of IPAM’S REDD+ project in the Transamazon highway region. We conducted initial baseline research on the project from June to August 2010. We first interviewed the proponent to understand project design and implementation strategies and to identify target communities. The four communities sampled (Figure 1) were based on organizational units known as *nucleos*, which were created by FVPP during the *Proambiente* program. We used the groups of people that comprised distinct *nucleos* as the starting point to define community boundaries for our work and expanded it based on local definitions of social organization. In some cases, we

considered a portion of a land reform settlement area a community, and in others, we defined households along one or more secondary roads that branched off the Transamazon Highway as a community. At the time of our research, the REDD+ project was still in its design stage; IPAM had conducted one meeting to explain the project to each community groups that had participated in *Proambiente*, but had not yet begun implementation.

To analyze local perceptions about the incipient REDD+ project, we first interviewed key informants and held community-level meetings that included an average of 15 participants (both men and women). We then interviewed 137 households (preferably both the head of the household and the spouse were interviewed simultaneously), which were randomly selected from a stratified sample in each of the four communities (Table 1) to include both participants (the same families previously selected to participate in *Proambiente*) and non-participants in the same communities.

Table 1. Basic characteristics and sample size of study communities.

| <i>Community basic characteristics</i> * | Community 1 | Community 2 | Community 3 | Community 4 |
|---|--------------------|--------------------|--------------------|--------------------|
| Total land area (ha) | 41000 | 18500 | 19900 | 5500 |
| Year established | 1982 | 1987 | 1972 | 1982 |
| No. households (2010) | 198 | 220 | 158 | 120 |
| No. households interviewed (p; np) ⁺ | 33 (17 p; 16 np) | 33 (15 p; 18 np) | 36 (21 p; 15 np) | 35 (20 p; 15 np) |

* Data on total land area, year established and number of households reflect estimates by key informants, such as the presidents of community associations or community health agents; ⁺p = interviewed families that were previously selected to participate in the REDD+ project; np = interviewed families that were not selected to participate in the REDD+ project.

In the household interviews, we first asked if the families had heard about REDD+ or about the local REDD+ project, and if they could give a brief explanation of the general concept or the specific project. The first question was designed to understand if people were aware of the broader REDD+ concept as relates to forest-based climate change mitigation; the second was designed to verify if they had access to information about the local REDD+ project. Both questions were used as a screening mechanism to decide whether or not it was appropriate to ask further questions about the project. For those respondents who showed a basic understanding of REDD+ and/or the local REDD+ project, we then posed the following questions: (i) What are your hopes about how the project will benefit your household? (ii) What are your worries about how the project will affect your household? and (iii) What are your recommendations on how the project should be improved? These questions were open ended, and the households could offer multiple responses to each question, which we categorized during data analysis.

4. Results

4.1. Local Knowledge and Perceptions of REDD+

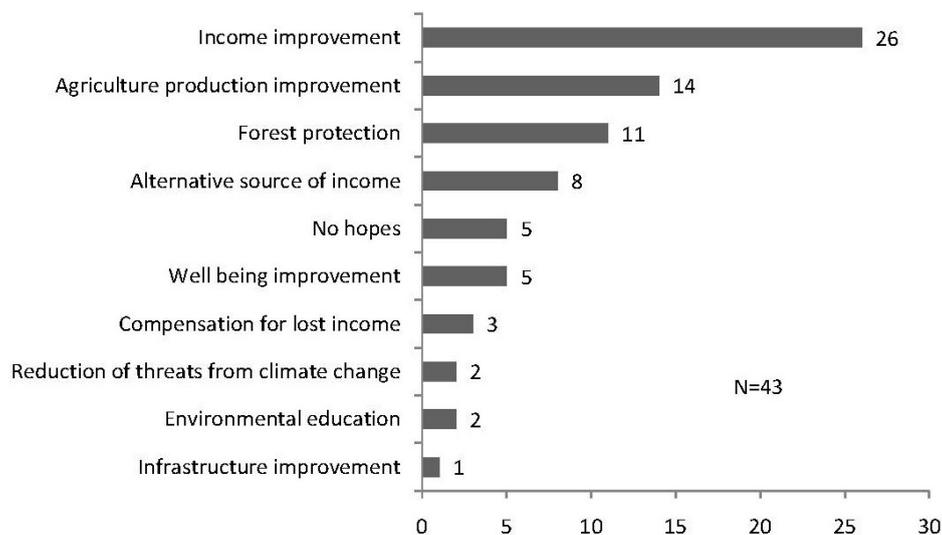
Of the households interviewed in the project intervention area ($n = 137$), 30% said they had heard about REDD+, 39% reported having heard about the REDD+ project, and 31% were able to accurately describe the project. The families' main sources of information on REDD+ were the project proponent (32%; mainly through the meeting where the project was presented), the media (20%), community

leaders (17%) and conversations with community members (15%). For the specific REDD+ project, the main source of information was also the meeting with the project proponent (42%), followed by conversations with community members (26%), information from community leaders (11%) and the media (11%).

In comparing results between households that were selected to participate in the REDD+ project ($n = 73$) and those that were not selected to participate ($n = 64$), we noted differences in access to information. Only 19% of the non-participant households had heard about REDD+, while 28% had heard about the REDD+ project. For the participant households, these percentages were higher: 40% and 49%, respectively. That said, when asked about their engagement in project decision-making, only 21% of the participant households reported involvement, which meant attending the meeting where the proponent presented the project and solicited suggestions.

For the 31% of households ($n = 43$) that expressed a basic knowledge about the Transamazon REDD+ project, we asked about their hopes, worries and recommendations for the project. In terms of hopes, the majority of these households (26) said they hoped the project would increase their incomes (Figure 2). The second most commonly listed hope (14) was that the project would contribute to improving production. This second category included answers related to access to machinery, technical assistance to improve soil fertility, capacity building on the use of already deforested areas for agriculture and reduction in the use of fire, provision of seedlings and resources for reforestation activities, and implementation of fish farming systems. One farmer summed up this category saying: “[I hope] that a smallholder will be able to live well on his land, not only today, but for many generations to come” (man, 26 July 2010). The third most commonly listed hope (11) was that the project would help protect the forest. Notably, five households had no hopes to report largely because of disappointment related to previous projects that started but never concluded, including *Proambiente*.

Figure 2. Households’ hopes related to the local REDD+ project.



Overall, households expressed more hopes than worries, indicating that they had high expectations associated with project implementation. Their main worry was that the REDD+ project would fail to start or continue, and they expressed concerns about its potentially negative impacts on household livelihoods (Figure 3). One concern related to the possibility of the project limiting land use and

agricultural practices, which highlights the perceived conflict between forest conservation and agricultural production. Households reported that while they did not like to clear the forest, the swidden system, which involves cutting and burning forested areas in a rotational way to grow crops, represented their only option for food production. Farmers feared not being able to produce food if they were unable to deforest new areas and use fire, as reflected in the following statements.

“If I did not have to grow food, I would leave the whole forest standing; she [the forest] is beautiful, fresh and good. But who lives in the field has to survive”

(man, 25 July 2010)

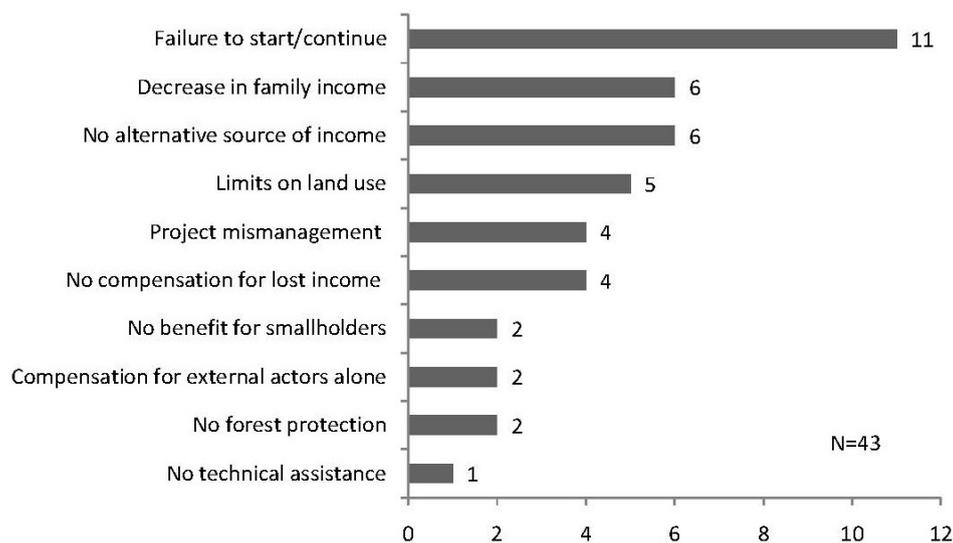
“Cutting down the forest is to cut down life and to cut down the future, but sometimes we need to”

(man, 19 July 2010)

“I worry about having to stop doing swidden agriculture. How [can we] survive without clearing the land?”

(man, 20 July 2010)

Figure 3. Households’ worries related to the local REDD+ project.



In one of the community meetings, while some smallholders expressed concerns about not receiving an adequate amount of money to compensate for a decrease in agricultural activities, others expressed fear of dependence on direct cash payments. Some meeting participants warned that such payments might make farmers stop working. As one meeting participant stated, *“It is bad for a farmer to rely on cash* (man, 25 July 2010).” Other households expressed concerns about corruption and project resources being deviated from communities. One community member summed up this concern in saying that the project might only benefit the proponent organization through employee salaries and acquisition of vehicles and equipment, with no resources allocated to the communities.

4.2. Local Recommendations for the REDD+ Project

Nearly half of the households familiar with the project (46%) recommended that it provide benefits related to improvement of agricultural production, which we categorized as “improved local production systems” (Table 2). Such benefits included investments in machinery and technical assistance, as illustrated by the following comments:

“These institutions must give priority to the most needy with support in the form of technical assistance”

(woman, 22 July 2010)

“[The project proponents] should help small farmers in their production systems to increase their incomes”

(man, 12 July 2010)

“These projects could bring technical assistance and collective machinery to improve production”

(man, 18 July 2010)

In the community meetings, participants expressed that they considered technical assistance, mechanization and investments in infrastructure more important than direct cash payments. They had specific suggestions for interventions to improve production systems, such as mechanization to allow for the use of degraded areas to grow crops, along with materials and training for cocoa cultivation, poultry and fish farming, beekeeping, and management of non-timber forest products. One of the participants emphasized that the project should help farmers add value to their products through local processing and help them bolster the productive potential of the region: *“We want a small rural enterprise on our properties”* (man, 24 July 2010). Furthermore, during the community meetings, one of the themes that often emerged was the government’s absence in providing basic services and road maintenance in rural areas, and the potential role for the REDD+ project to provide such services. In this region, the need for better infrastructure is notable, as road conditions are especially precarious in the rainy season (January–June). For most of the side roads, only transit by four-wheel vehicle is possible, which limits households’ access to urban health services and affects product commercialization. Products lose competitiveness in the market due to high costs of transportation, as reflected in the following statement: *“Sometimes we have something to sell, but it does not compensate, because the costs of transport are more expensive than the value of our products”* (man, 21 July 2010). Loggers often make up for the lack of government investment in infrastructure through maintaining secondary roads, as reported by these two smallholders: *“Until today the loggers are the ones who maintain the road. INCRA does nothing”* (man, 19 July 2010). *“The trees that were removed were given [to a logger] in exchange for a road to my farm. If I could, I would never sell a tree, but since I am poor, I have to do this”* (man, 24 July 2010).

Table 2. Households' recommendations for the local REDD+ project.

| Households' recommendations (n = 43) | | |
|--|--|---|
| (1) Improved local production systems (46%) | Technical assistance, capacity building activities, machinery and inputs | - Support for local production systems, including technical assistance and agricultural inputs for soil mechanization and irrigation. - Infrastructure and technical assistance for new enterprises (fish farming, poultry and beekeeping). |
| | Improved infrastructure | - Support to improve local utilities (water, electricity) and provide infrastructure (roads, schools, health centers, dams), reduction of transportation costs. |
| | Sustainable agriculture | - More sustainable and conservation-friendly agricultural practices, which do not require the use of fire. - Provision of environmental education and access to public financing to diversify production. - Machinery and technical assistance to grow crops on already degraded lands. |
| (2) Benefits aligned with local needs (19%) | Community participation | - Access to information and transparency, sufficient consultation with and inclusion of community members in decision-making. - Involvement of local people in project implementation and management. |
| | Equity in benefit sharing | - Equity in the distribution of benefits. - Increase in number of project participants. |
| | Incentives aligned with households' preferences and needs | - Focus on improved household wellbeing and not only on forest conservation. - Less restrictions on local land uses and livelihoods. |
| (3) Avoided experiences of past conservation projects and good project management (18%) | Fulfillment of promises | - Realization of concrete project results. - Greater efficiency so that projects are not simply experimental, but also definitive. - No repetition of mistakes of earlier conservation projects. |
| | Improved project management | - Good management of finances for funds to reach the community members and not only the proponent institution. - Transparency and local participation in the management of project funds to avoid corruption. |
| (4) Adequate compensation to avoid deforestation (13%) | Adequate compensate for income losses | - Increased value of direct cash payments to compensate for losses associated with changing productive activities. - Continuous benefits to communities when people are required to stop their activities - Guarantee of a fixed income. |
| (5) Forest protection and restoration (4%) | Effective forest protection and help for households in restoring degraded areas. | |

We categorized the second main group of recommendations (19%) as “benefits aligned with household needs” (Table 2). The recommendations in this category include the engagement of households in project design and implementation, and the sensitivity of project proponents to local conditions and smallholder needs, as reflected by the following statements:

“[I recommend] that the project considers the quality of life of small farmers and is implemented honestly”

(man, 21 July 2010)

“[I recommend that the project proponent] discusses with the community in deciding what is good for the community”

(woman, 14 July 2010)

“For the project to make good progress, [the project proponents] must first consider farmers’ needs”

(woman, 22 July 2010).

These statements stress that community members wanted to be deeply engaged in project design and implementation, and even take a leadership role. Indeed, in one community meeting, participants expressed interest in designing and validating their own REDD+ project, and asked the CIFOR researchers if they knew about the procedures for doing so.

We categorized the third group of recommendations as “avoided experiences of past conservation projects and good project management” (Table 2), which reflect smallholders’ dissatisfaction with the *Proambiente* experience:

“Keeping the forest standing is not difficult. It’s good! The mistake of Proambiente was to not grant farmers what they were promised. There is talk of many projects, but then nothing happens and deforestation continues. Money is rerouted and does not get to who needs it most”

(man, 18 July 2010)

“The project has to benefit the small farmers and not only the forest [...] Proambiente did not pay enough, and farmers were [still] prevented from performing swidden agriculture”

(man, 03 August 2010)

“Don’t make the same mistakes as before. There were many promises; today people are disillusioned and disgusted”

(woman, 19 July 2010)

“Since Proambiente, farmers have reduced deforestation and the use of fire. They also reduced swidden agriculture. This jeopardized their incomes and diets”

(man, 25 July 2010)

The statements above emphasize smallholders’ disappointment with *Proambiente*, in which they committed to changing their behavior, but never received the promised benefits. Consequently, some farmers perceived that the program had negative outcomes on peoples’ incomes and food security, as illustrated by the last statement. Despite this disenchantment, some farmers mentioned that a positive aspect of *Proambiente* was the use of property management plans. To create these plans, each household first documented its land use area with the help of a technician, then envisioned a desirable

future scenario for the property over a 15-year period, and finally created a detailed plan to reach the desirable outcome. Although this was considered a positive process, households expressed frustration about not being able to put their plans into practice, as they never received the technical assistance and materials assured by the program.

The fourth main recommendation category relates to the value of compensation payments, which we labeled “adequate compensation to avoid deforestation” (Table 2). Throughout the interviews and meetings, we observed different understandings of PES and suggestions on how to determine the value of the cash payments. For instance, one farmer associated direct cash payments with the opportunity costs of reducing deforestation: “*The project has to compensate what we would earn from swidden agriculture, cattle and cocoa*” (woman, 22 July 2010). Another farmer recommended that the payment amount be based on the household’s forested area: “*The payment has to be based on the forest area in each lot and it must start soon, because families are tired of waiting*” (man, 14 July 2010). During a community meeting, still others argued that the value should be equivalent to the national monthly minimum wage (USD 290 in 2010). Independent of how the payments were calculated, many farmers emphasized that the value needed to be high enough to motivate behavior change, as seen in the following statements: “*They came to talk about a project in which we would earn [USD 16.50] per month during the first year, and then [USD 34] per month in the second year, and so on, if we have 50% of forest cover in our lot. But for me, it was a joke, because we would spend [USD 17] in travel just to get the [USD 16.50]. [This is] an immoral charity*” (man, 20 July 2010); “[*we must*] receive a decent resource to be able to preserve and sustain the family” (man, 14 July 2010); and “*the payment for environmental services must be worth it for the small farmer not deforest anymore*” (man, 21 July 2010).

5. Discussion

5.1. Access to Information and Local Participation in REDD+

Access to information is the first entry point for facilitating local people’s participation in REDD+. Our results showed that households’ familiarity with REDD+ and/or with the local REDD+ project was low, and that there was a difference in access to information between the group that was engaged in *Proambiente* and the group that was not. In general, fewer families were familiar with the concept of REDD+ than with the local REDD+ project. This result makes sense given that it takes much more effort to conduct educational outreach about a complex topic like REDD+, which is embedded in broader discussions about the role of forests in climate change mitigation, than to introduce a new project. The main source of information that households had about the REDD+ project was from the one meeting held with participating families to present the initial project and collect suggestions, followed by subsequent conversations among community residents. According to IPAM, these initial meetings helped inform the proposal that was submitted to BNDES for Amazon Fund support (R. Rettman, pers. comm, 17 November 2010). In addition, several community representatives chosen by the proponent were involved in additional dialogues before project submission, and again in 2010 when members of BNDES visited IPAM’s regional office in Altamira, (L. Souza, pers. comm., 2 August 2011).

Despite these early communication efforts with communities, there may have been an opportunity for the proponent to better involve local farmers in REDD+ project design and provide information to neighbors who were not directly involved with the project, but could be indirectly impacted. According to IPAM, one reason for not involving local families in the early design of the REDD+ project was to avoid raising expectations, since the proponents were waiting for BNDES approval (L. Souza, pers. comm. 2 August 2011). Other REDD+ proponents have used the same reasoning to justify their low interaction with local people at the early stages of project design [18,21,38]. Indeed low levels of access to information were similarly found in a cross-national comparison of nine subnational REDD+ initiatives, including the Transamazon, where of a total of 1,243 households interviewed, only 327 (26%) had heard about the concept of REDD+ and 502 (41%) had heard about the local REDD+ project [21]. The authors acknowledged that the low numbers could be partly a reflection of the early project stage at which the data were collected; some proponents had delayed their outreach work in relation to REDD+ and/or the project due to an uncertain future about REDD+.

While this conservative approach is understandable, it is also problematic in that it reduces the possibility of getting local people involved in the design of REDD+ interventions and benefit sharing mechanisms, which may be harder to change after a project is approved. If local people have information about the broader debate in which REDD+ is inserted, comprehend its associated risks and opportunities and have a hand in local project design, they may be more apt to understand the uncertainties associated with fundraising. They may also more clearly recognize their roles in the project, which could bolster the quality of participation. Finally, if REDD+ proponents do not have the buy-in of local people, their efforts are bound to fail. Even though *Proambiente* emerged from civil society, most producers from the Transamazon region did not participate in the program design nor share the same vision of their organizational representatives, which led to a certain resistance among farmers to adhere to the program [33].

Many households that had heard about the REDD+ project at the Transamazon site expressed interest in having more information about it and being more actively involved in project design. They specifically requested information about the project budget and use of the funds to achieve a more transparent process and avoid corruption. They even showed interest in being the proponents of their own REDD+ project, which highlights an opportunity for NGOs and government agencies to build project management capacity at the local level, despite associated challenges. In the short term, enhanced local participation would help align project incentives with local needs; in the long term, these farmers could become protagonists of REDD+, possibly even managing their own projects in partnership with local associations or NGOs. Mechanisms are needed to ensure effective local participation in REDD+ with clear links between communities and higher-level decision-making processes [39]. Local participation in REDD+ can and should go well beyond information sharing.

5.2. Defining REDD+ Mechanisms Together

REDD+ initiatives that actively include local people in their design and implementation may have a greater chance of success in providing longer-term benefits for local people and forests. That said, diverse perceptions about any given set of REDD+ interventions will always exist; dialogue within and between different stakeholder groups can help identify areas of conflict and shed light on points for

reconciliation. While our results highlight a diversity of local perceptions about the two major incentives (PES and alternatives to swidden agriculture) proposed by the Transamazon REDD+ project, they dovetail on two main lines of thinking: a lack of confidence in direct cash payments and the prioritization of investment in improved production systems while valuing local practices.

First, there were fairly negative attitudes toward the PES component of the project. Several farmers were against the inclusion of cash payments for fear of becoming dependent on money for survival and reducing their productive activities; a concern that is reflected in the literature [40,41]. Among those that recommended the inclusion of cash payments, there were questions about the value and equity of the proposed payment. Some farmers simply suggested increasing its value, others recommended basing the value on the amount of preserved forest on each lot, and still others indicated that the payment should adequately compensate them for a future loss of income, following the logic of compensating the opportunity costs of changing activities [42]. These concerns relate to ongoing debates in the literature about basing compensation payments on opportunity costs analyses. Corbera *et al.* [16] conclude that direct cash payments usually do not adequately compensate farmers for the opportunity costs of changing activities, and farmers often perceive the value offered as unfair. In addition, payment values based on opportunity costs do not account for the risks associated with changing from one livelihood activity to other, such as the availability and fluctuation of prices of basic goods that farmers are no longer able to produce through traditional land uses [43]. In the Transamazon, it would be particularly difficult for farmers to buy staple goods due to difficult access to local markets, especially in the rainy season, and subsistence farming is an important component of local livelihoods. Finally, opportunity cost analyses, which focus only on market prices, are likely to exclude the social, cultural and governance values of traditional agricultural practices [43]. Instead of only relying on market approaches and price formation to determine financial payments, policy makers should critically assess the possible impacts of these payments on the different types of capital (human, social, physical, natural and financial) in rural areas [44]. Furthermore, if REDD+ simply compensates people for what they would have received from an activity that caused deforestation, it could become a poverty reproducer [1].

Secondly, although our results reveal that the majority of the families hoped that the project would increase their incomes, families generally favored incentives oriented to improving their production systems over direct cash payments. While some farmers demonstrated interest in receiving cash, the majority advocated for incentives related to access to machinery, technical assistance and capacity building, along with improvements in community infrastructure. Importantly, such elements are included in IPAM's project plans, along with the PES component. Similar preferences are reflected in other PES-like sites in Brazil. In two *Proambiente* communities in Acre, participants favored non-monetary benefits, mainly related to technical assistance and infrastructure, instead of financial benefits [45]. In the *Bolsa Floresta* Program in Amazonas, families preferred benefits related to community development, and community members were not satisfied with the monthly payment value offered by the program [23]. In addition, Patheram and Campbell [46] analyzed the perceptions of residents of a national park in Vietnam, where the introduction of a PES scheme was being considered. They verified that while people were generally willing to be involved in the project, they opposed the idea of PES without accompanying livelihood enhancement activities. This evidence illustrates the

importance of non-economic benefits, and how relying on direct cash payments alone will likely not be an effective incentive for people to conserve forests if other needs are ignored.

Even though most households interviewed recommended that the project should invest in improving agricultural production, many also expressed concern about abandoning traditional swidden agriculture practices. They reflected on the negative impacts of being prevented from using these practices based on their experience with *Proambiente*. In Brazil, many REDD+ project proponents identify the practice of swidden agriculture as a key driver of deforestation, and a common REDD+ strategy is to curb this practice. Yet, for generations of smallholders, swidden agriculture represents a primary livelihood strategy based on geographical, historical, cultural and political factors [26,47,48]. The use of fire for clearing cultivation areas and the use of ash as a fertilizer are techniques adapted to the regional context and are responsible for reduced expenditures on agricultural inputs, including hired labor [49]. The adoption of alternatives to swidden systems is not a simple process; it usually requires more household labor or hired labor, and farmers do not usually see results in the short-term [50]. Therefore, concerns of some farmers in our sample about being forbidden to clear forest and engage in swidden agriculture are extremely legitimate, as such a drastic change in land use could have negative effects on livelihoods and household organization [51]. Instead of assuming that small farmers' land use systems must be replaced with more "sustainable" practices, there is much to be learned about how local production systems are important for food security, household economies and local adaptation strategies. A better understanding of local production systems would allow for the design of a long-term sustainable land use plan that values what is already in place, while introducing or improving land uses according to local preferences, suitability to ecological conditions and low emissions development objectives.

Although farmers' perceptions focused on a few main elements of the REDD+ project; the diversity of recommendations expressed highlights the complexities of elaborating equitable REDD+ mechanisms. This diversity also highlights the need to effectively involve local people in participatory decision-making, even within a group of people that could be considered "homogenous" (*i.e.*, colonist farmers). Lessons from pluralism in forest management suggest that participatory processes should not be oversimplified; such diversity should be recognized and valued, with the strategies needed to handle it emerging from the group [52]. Creating spaces for interactions between people with different skills and perceptions could enrich REDD+ decision-making processes and avoid forced consensus that are too often imposed by more powerful actors [20,52]. This approach could start early on in REDD+ project design and continue throughout implementation in the spirit of adaptive management [53]. Although promoting such venues to encourage participation may increase early project costs and implementation time, and require well-skilled facilitators, evidence suggests that effective participation can help reduce implementation costs, especially those related to enforcement and monitoring [54,55]. Furthermore, we argue that REDD+ interventions cannot be one-size-fits all. Proponents must make big efforts to address the tensions between agricultural production and forest conservation, and combine local and technical knowledge, to promote project effectiveness, efficiency and equity over the long term.

As a way to incorporate local heterogeneity in the Transamazon REDD+ project, IPAM will engage individual farmers in the creation of property management plans that will combine both technical and local knowledge to jointly determine the specific interventions to be applied on each property. As

mentioned earlier, the process of creating similar plans in *Proambiente* was considered by participating families to be its most positive aspect. In the Transamazon, through basing customized interventions on local knowledge, land use practices and aspirations, such plans hold promise as a tool for promoting more active local participation in REDD+.

6. Conclusions

This research has emphasized that while REDD+ safeguards present an important opportunity for assuring that local people are involved in REDD+ design and implementation, high performing REDD+ initiatives should demonstrate participation that goes beyond passive consultation. While our study focuses on one site in the Brazilian Amazon, the results support the broader idea that greater local participation in REDD+ can facilitate the development of interventions that best reflect local knowledge, land use practices and aspirations.

Access to information should be promoted early in the design phase and include explanations about REDD+, the different interests involved, and associated risks and opportunities to allow for critical appraisal by local community members. Information should also reach people who may not directly participate in the project, but are likely to experience spillover effects. Participation must then go beyond information sharing to incorporate a diversity of local perceptions in REDD+ design and implementation. Our study in the Transamazon indicates that by listening to local recommendations and valuing local production systems, there is great potential to create long-term strategies for sustainable land use that could fulfill the expectations of both REDD+ proponents and small farmers. Incorporating farmers' perspectives into the design of REDD+ interventions may not only bolster equity and local well-being, but also improve cost-effectiveness by reducing the need to invest in new rules and payment modalities later on. A failure to do so risks harming community social relations and local livelihoods.

This paper argues that only through including local people as protagonists in REDD+ design and implementation will it be possible to make effective and practical recommendations about strategies to promote sustainable livelihoods. Forest conservation and rural development synergies will likely be enhanced if local people are genuinely involved in all steps of any initiative. More field-based research is needed to understand the relationships between REDD+ interventions and local livelihoods, and the types of arrangements that ensure or dissuade effective local engagement in project design and implementation.

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Author Contributions

Marina Cromberg carried out fieldwork and analyzed data. Amy E. Duchelle coordinated the research. Isa de Oliveira Rocha provided academic guidance. Marina Cromberg and Amy E. Duchelle wrote the paper.

Conflicts of Interest

The authors declare no conflict of interest.

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