Socio-Economic “Windows of Opportunity” in Ipeti-Emberá, Panama

Julie Raynaud and Xoco Shinbrot
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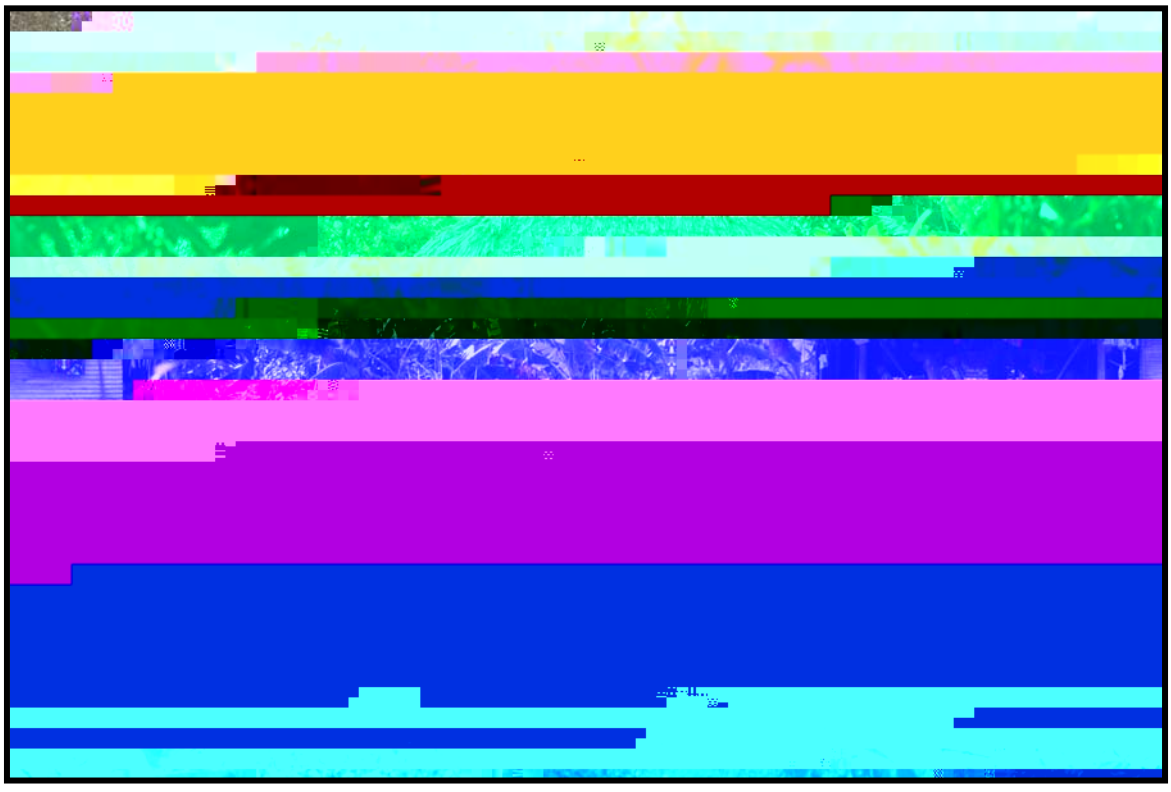
Superivisor Ignacia Holmes
ignacia.holmes@gmail.com



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By: Julie Raynaud and Xoco Shinbrot

Introduction

Study Site: The Community of Ipetí-Emberá

The study took place in the indigenous *Tierra Collectiva* of Ipetí-Emberá in the district of Chepo, eastern Panama. The community is located in the watershed of Alto Bayano, adjacent to the Pan-American Highway, 120 km east of Panama City.

Host institution

OUDCIE and the *Dirigencia*	**McGill University**	**Smithsonian Tropical Research Institute**
Ipetí-Emberá	845 Sherbrooke St. West	Apartado Postal 0843-03092
Provincia de Panama	Montreal, QC	Balboa, Ancon
333-0803	Canada	Panamá, República de Panamá
	H3A 2T5	
	514-398-4455	

Project Background

Methods

The same methods as the socio-economic study of Petra Tschakert (2006) were used, and the survey was only adapted a little in order to better fit the actual context of the community. The questionnaire was conducted with the same families, to which we added four households who are engaged in the REDD project since 2008. Two women of the community helped us with the questionnaire. Mcgill Protocol for Research in Panama's Indigenous Communities (http://www.mcgill.ca/pfss/protocols_and_ethics/) was followed: every house is coded to maintain participation anonymous. Moreover, oral consent was asked.

Results and Discussion

The results from the household surveys reveal that there is an average of 7.2 individuals per household, mean land holdings of approximately 44 ha, non-land asset values at approximately US$ 4,077, and a median annual income of US$ 3,084. While certainly the community members of Ipetí-Emberá have gained a better standard of living, there certainly exist differences between the three household wealth groups, which were defined in 2004 through participatory household wealth ranking.

In terms of differences within the community as a whole, everyone is better off than they were four years ago, as the total average income per capita has almost doubled from $345.61 in 2004 to $633.90 in 2008. However, it is important to note that inequalities within the community on almost all levels have also increased. Based on the gini coefficient, a statistical measure of inequality where one is complete inequality and zero is complete equality, the coefficient for total income has risen from 0.52 to 0.62 within the last four years. The gini coefficient has risen in farm income from 0.58 to 0.76 as have the coefficients for non-farm income from 0.62 in 2004 to 0.77 in 2008. These findings indicate that while the standard of living has risen as a whole so too have the inequalities within the community.

When analyzing the data between those that participate in reforestation and avoided deforestation projects, the carbon group, and those not participating in these projects, we found that the single most important difference was that of total income. While those who participate in carbon offset earn an average yearly income of $3,463 those that do not earn approximately $2,276 per year. Total land holdings and the amount of forested area also in part explain the participatio

Acknowledgements

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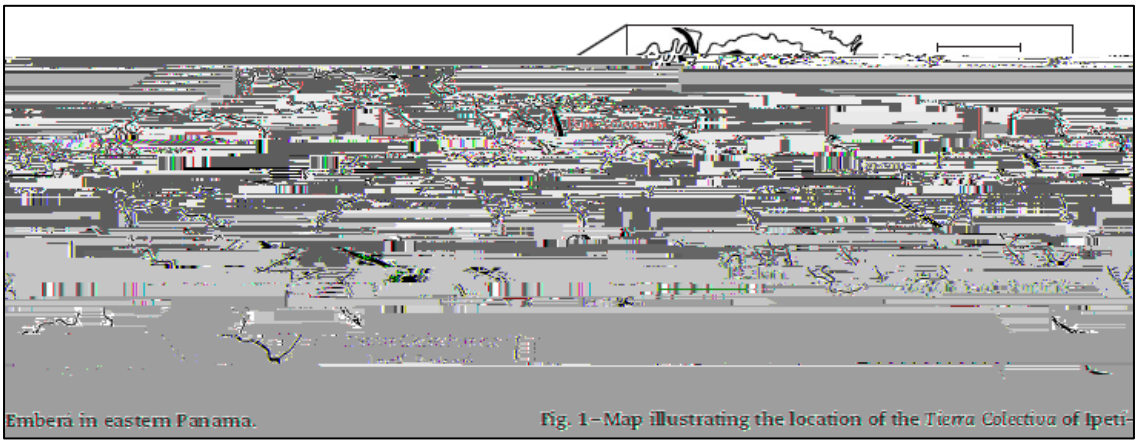
Introduction

Study site

The study took place in the indigenous *Tierra Collectiva* of Ipetí-Emberá in the district of Chepo, eastern Panama (78°30'-78°34 W, 8°55'- 9°00'N). Ipetí is located in the watershed of Alto Bayano, adjacent to the Pan-American Highway, approximately 120 km east of Panama City (Coomes et al. 2007).



Map 1: Map of the study site, source: Tschakert et al. 2007

The Emberá migrated from Darien to the region of Alto Bayano in the 1950s. Between 1972 and 1976, the community was displaced by the construction of the hydroelectric dam of Ascanio Villalaz, along with 1,500 Kunas and 2,500 colonists farmers of the region. The 500 Emberá were relocated along Rio Ipetí, and given land under the "Convenio de Majecito" by General Omar Torrijos, then president of Panama.

ranging from 1 to 100 ha in size (*Ibid*). Land titles are not communal, but community regulations hinder the sale of land to outsiders. As of 2004, nearly half of the land was still forested. Elevation ranges from 50 to 300 m above the sea level; daily temperature and annual precipitation averages 24 to 26° C and 2000 to 2500 mm, respectively (*Ibid*). Eighty-one families live in the community, either in Ipetí-Emberá or in Periati, along the road to Curti (Coomes et al. 2007). The most wide-spread type of agriculture within the community can best be called "multi-fallow crop system" (Tschakert et al. 2007). The Emberá are part of the dual economy, both producing for their subsistence and buying and selling goods and services in the national market economy.

Host organization

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	514-398-4455	

This study is part of a REDD project led jointly by McGill University, the Smithsonian Tropical Research Institute (STRI) and the *Organización de Unidad y Desarrollo de la Communidad de Ipetí-Emberá* (OUDCIE).

The *Organización de Unidad y Desarrollo de la Communidad de Ipetí-Emberá* (OUDCIE) is a non-profit organisation, legally constituted the 26th of November 1998. Its principal objectives are the implementation of conservation, protection and sustainable development programs, the preservation of Emberá culture and traditions, and the resolution of ecological problems in the community of Ipetí-Emberá. OUDCIE represents the 146 men and 151 women that comprise the community. Its executive committee is

et al. 2007) and has stimulated discussion on initiatives aimed at Reducing Emissions from Deforestation in Developing countries (REDD), that involves lower start-up costs and less risks (Potvin 2008) and could thus be adopted more easily by communities such

The Rationale of Monitoring Socio-Economic Change

1. To assess the current socio-economic situation of Ipetí
2. To monitor socio-economic changes between 2004 and 2008
3. To identify the socio-economic characteristics of participants in carbon-related projects.

Methodology

Ethical Protocol

To maintain the integrity and confidentiality of the participants we will not disclose the

Work time

	Hours in the field	Hours in project	
Working time per person	1 hour per 20 questionnaires + 10 h of training + 5 h other = **35**	22 days in the field + 5 hours of survey adaptation + 20 hours of data entering + 20 hours of statistical analysis + 60 hours of research and redaction + 40 hours other (STRI work shop i.e) = **365**	
Total Working time	35 x 2 = **70**	325 x 2 = **830**	**Total: 900**

Data collection

In order to compare our results with the socio-economic study conducted in 2004 by Petra Tschakert we used a similar questionnaire (see app. 1). Following a participatory wealth ranking exercise, Petra Tschakert and community members selected a total of 36 households and classified them in three resource-endowment groups, with wealth group number one as having the high income and wealth group three as the low income group, with group two as the medium income group (Tschakert 2007). While we used the same households and the same codification, we also added four additional households that are currently participating in or are willing to participate in the REDD initiative. We thus had a total of 40 households for the analysis. Nevertheless, as some households experienced some changes, we had to slightly modify the sampled households: 1. As one household in the first wealth group had moved to Panama since 2004, we thus replaced it with one from the same resource-endowment group; 2. One household in the second wealth group

refused to participate in the study and due to time constraints we were not able to replace it; 3. The spouse in one household belonging to wealth group one had died and the father moved with his son who originally belonged to wealth group two, so that both families were aggregated into the medium income wealth group; 4. And finally as previously noted, four additional households (REDD group) were added.

We also tried to include as much as possible participative elements in the survey process than the one in 2004, in accordance with the theoretical framework of Participatory Rural Appraisal (PRA). The primary goals of PRA are to enable the "rural people to share, enhance and analyse their knowledge of life and conditions, to plan and act" (Chambers 1994). Thus, OUDCIE chose two women from th

crosscheck the information. (3) Finally, we would add a part where each family would fill out an agro-forestry calendar.

We then selected two families of the community, not included in the survey, in order to test the survey's efficacy. These test families were extremely important for testing out our participatory methods. The results from the test families were that these aspects of the survey added very little to the dynamics of the survey, indeed none families seemed interested in participating in some of the activities. Following this preliminary survey, the questionnaire was again adapted. We thus followed an adaptive and participative approach (Chambers 1994).

Each of the two researchers was paired with one research assistant and each team completed between two to five surveys per day on average. We chose to have the research assistant conduct the majority of the interviews simply because the families were more comfortable and open in speaking about personal information to a community member. While we began the surveys by making appointments with each family, it became clear that it was easier to simply catch them when they were available, as they would often forget the appointments.

With the aim of estimating each household livelihood, assets, and land management practices and their changes since 2004, the survey had questions regarding household demographics, land use, management and history, parcel holdings and plot sizes, agricultural production and distribution, animals, agricultural equipment, social networks, household income and expenditures, and risk management (Tschakert, et al. 2007). Livelihood assets are comprised of human capital (household members, active labour, education), physical capital (productive capital, consumer durables, livestock), natural

capital (access to land), financial capital (income, expenditures), and social capital (kin networks, group membership).

Triangulation is an important component of survey completion and analysis and this survey was no different (Chambers 1994). We repeated certain questions at different moments in the questionnaire and in different contexts, and we tried as often as possible to assure the presence of more than one household member during the interview so as to cross check the data. Hence, women often answered the questions relating to handicraft production and sale, as well as expenditures of the household in food. Teenagers would sometimes help them to answer this part too. In the sections on land management and agricultural production, the men who worked and owned the land tended to be the most reliable.

Data analysis

The data analysis was completed using the software SyStat and revolved around two differing themes: the socio-economic changes that occurred in the community since 2004 and the socio-economic characteristics of individuals engaging in carbon-related projects.

First, in order to account for the changes since 2004, we conducted a Repeated Measures ANOVA on the same categories as the one analysed by Petra Tschakert, namely on household demographics, sources of income and landholdings. Repeated Measures ANOVA answers two hypotheses: how do the treatment (here, resource-endowment group) mean changes over time, and how do treatment differences change over time. Hence, RM ANOVA is useful in calculating the data co-variance structure and in identifying changes within and between resource-endowments groups through time.

Alongside, to quantify inequalities within the community, we calculated gini coefficients of different income sources for the three resource-endowments groups and compared it with those of 2004.

Second, a multivariate analysis of variance (MANOVA) was used to determine the socio-economic characteristics of individuals participating in carbon projects. One of the advantages of MANOVA, as well as of Repeated Measures of ANOVA, is that these analyses are quite insensitive to skewed distribution. MANOVA quantifies the correlation between multiple predicators and response variables. Household size, labour availability, total assets, productive capital, the amount of

less knowledgeable. As traditionally women's work in Ipetí is within the household, they have little reference to how much land, what type of land, and how much is produced by their land, despite the fact that they directly benefit from it.

Income-expenditure gap

Finally, we noted a significant difference between income and expenditure, which may stem from a gap in both the mode of questions and the analysis. Several reasons may explain this gap. First, for the sake of simplicity, approximations were used in the questionnaire. Hence, if for example a household mentions that it buys one tank of gas per month at $5.50 each, it will be counted as 66$ per year (12 month x $5.50) in expenditures. However, this family may not buy a tank of gas every single month for lack of money or they may have been gifted a tank of gas, which is not accounted for in the analysis. Secondly, families often omit some sources of revenue, even when asked, and triangulation was not always possible. It should be underlined that the largest gap between income and expenditure (with expenditures exceeding income) was found among the medium income wealth group, the high income wealth group and the low income wealth group, respectively. However, if these numbers are adjusted to the amount of money that transact through the household in a year, the value is the highest for low-wealth household and the lowest for the high-wealth households. This may be because high-wealth households have higher levels of education than low and medium-wealth households, and have fewer difficulties with accounting.

	Average negative gaps (%)	Average negative gaps (value US$)	Gap/total transaction of money in the household (%)
W1	36	- 1608	13
W2	63	- 2322	39

Fig 1: Gap statistics

Statistical analysis

Small samples sizes are the main obstacles to the accuracy of the statistical analysis. Indeed, the Repeated Measures ANOVA was conducted on three treatment groups, each with n=11; the MANOVA two groups were comprised of n=30 and n=7 individuals respectively. This factor of error could be corrected by either increasing the sample size or decreasing the number of dependent variables.

Results

the community is actually divided into two wealth groups: the rich in one wealth group and the middle and poorer groups in the other (Tschakert 2007).

Fig 2. Web of Household assets, per resource-endowment groups

Changes in household characteristics and land use between 2004 and 2008

	W1		W2		W3			
	mean 2004	mean 2008	mean 2004	mean 2008	mean 2004	mean 2008	F-value 2004	F-value 2008
Total Household size	8,3	7,6	6,6	6,6	5,5	6	57.125***	36.639***
Male labour (15-64 years)	2,6	2,5	1,8	1,6	1,2	1,5	31.64***	50.743***
Female labour (15-64 years)	2,1	2,3	1,4	2,1	1	1	50.594***	44.645***
Total value of non-land assets ($)	5091	8368	584	1062	293	399	14.840***	7.922**
Value livestock ($)	3100	5145	279	561	81	211	9.297**	9.589**
Value productive capital ($)								

Fig 3. Household Characteristics, 2008

The value of non-land assets, which is comprised of productive capital, consumer durables and livestock, has increased dramatically over the last four years. While in 2004 the average household owned $1,948 worth of non-land assets, in 2008 on average people own $3,169, almost double that of 2004. The most significant category which has

increased is that of household consumer durables such as radio, clock, and stoves which rose from $526 to $914, indicating that people are buying more material goods. It must that there might be a residual error as we added some factors to the survey. Fishing line, hammocks, mask, harpoon, mosquito net and cell phones were added to the survey, but it is unlikely that these good make up the bulk of the changes as they are relatively inexpensive goods. This difference between 2004 and 2008 was confirmed with a Repeated Measures ANOVA. For total value of non-land assets, the within group F-test had a relatively high value of 2.429 and was found to be significant with a p-value of 0.129.

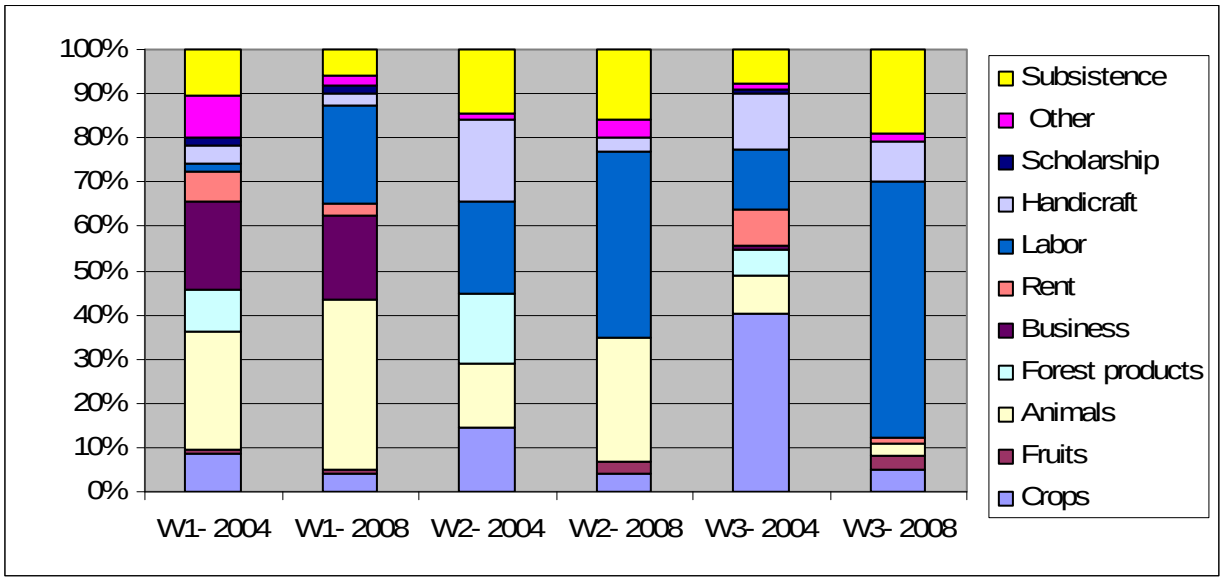
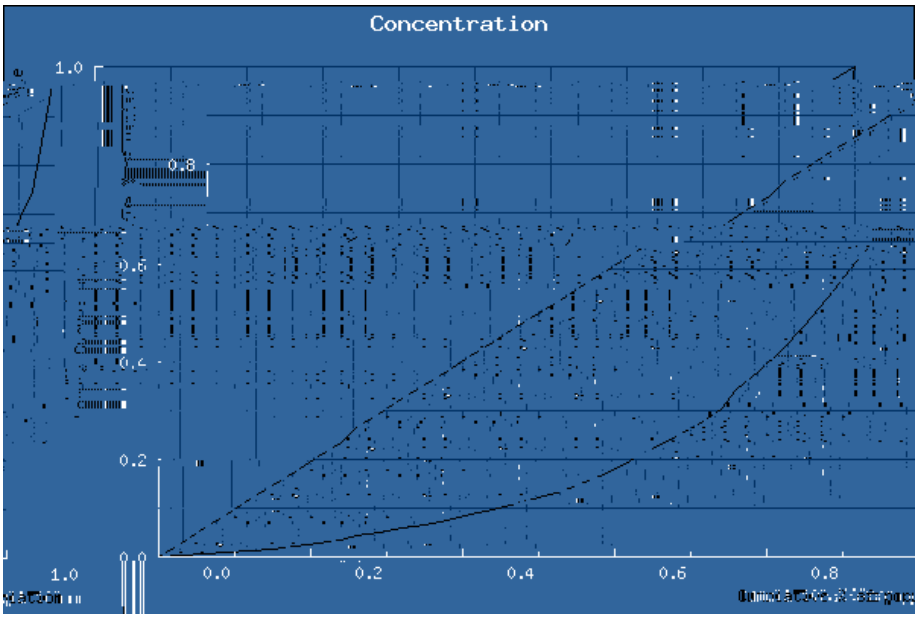


Fig. 4: Income repartition, per resource-endowment group, 2004-2008

An examination of the sources of income in 2004 and 2008 reveals that the biggest change is the increased reliance on labour (as peon, *motosierrista*, in the tek plantation, as security guards etc.). This might release some pressure on the land. It shows that individuals in Ipetí have been able to take advantage of the new window of opportunity that external employment represents. Income from the sale of crops has

significantly decreased, but this might be an ar

The inequalities that exist in Ipetí are highlighted by the comparison of the gini coefficients of income from 2004 and 2008. The most marked differences are apparent between the gini coefficients from farm income which increased from 0.58 to 0.76 over the last four years. This farm income category is comprised of income from retained output, sale of fields and/or



When examining the land holding size in the Tierra Collectiva of Ipetí-Emberá, it is apparent that there exist inequalities in land holdings. Of the 39 sample households, discluding those participating in avoided deforestation and reforestation, 22% hold little to no land (i.e. less than 0.5 ha) while only 20% of all the households hold 52% of the land. In terms of distribution of land types, the gini coefficient for total land holdings, pasture, and old fallow is 0.48, 0.75, and 0.75 respectively (Tschakert et al. 2007).

Socio-economic characteristics of individuals participating in carbon-related projects

	Carbon group Mean	Non carbon group Mean	R^2
Household size	6. 5	7.17	0
Male labour	2.4	1.69	0
Female labour	1.85	1.53	0
Dependency ratio	0.53	1.13	0,036
Total assets (US$)	2 272	3 219	0,016
Total land (ha)	112	60	0,054
Forest	66	56	0,053
Pasture	14	17	0
Fallow	25	28	0
Crops	4.5	6.4	0
Total Income	3 463	2 276	0.277
Farm income	1 008	2 228	0
Farm income (%)	29	46	0
Herfindahl-Simpsons index	0,14	0,21	0

Fig 7. Socio-economic characteristics of households participating in carbon-related

As of 2008, results shows that households participating in carbon-related projects have a higher mean household size (6.5 members), higher availability of male (2.4) and female labour (1.85) and a lower dependency ratio (0.53). Concerning economical variables, their total assets value are lower ($2 272) and their total income is higher ($3 463) even though they derive less income from alternative land uses (farm, cattle, timber) ($1 008). These households also have more diversified sources of income, as their Herfindahl-Simpsons Index is lower (0.14). Further, they own more land (112 ha), and these lands are more forested (66 ha).

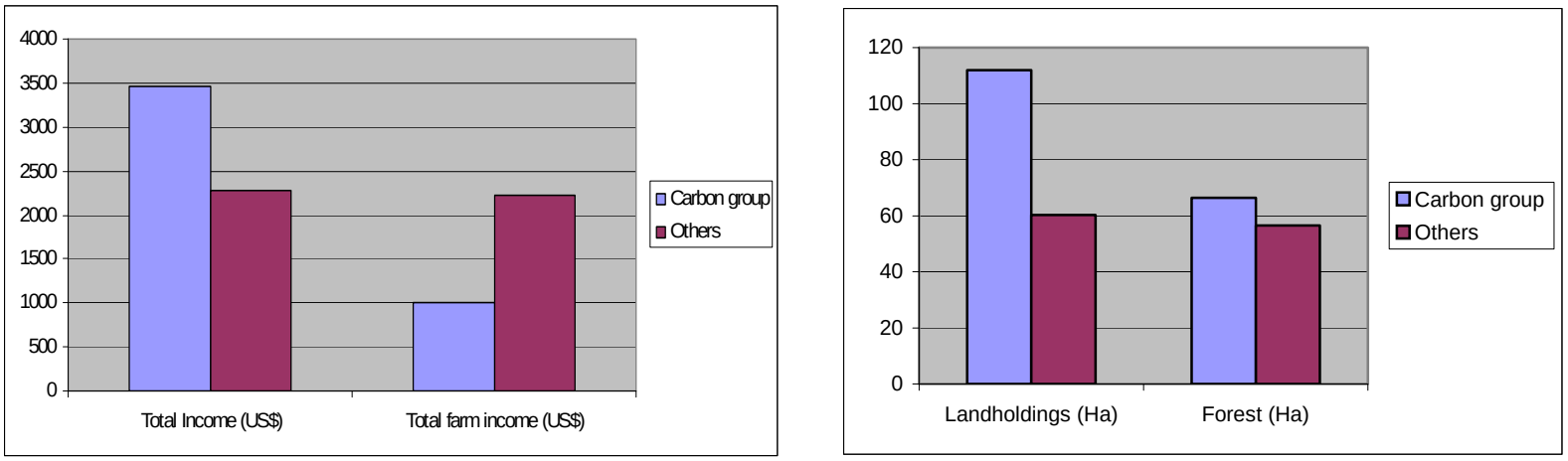


Fig 8. Comparison of socio-economic characteristics of households participating in carbon-projects

The MANOVA test confirmed the initial intuition that households participating in carbon-related projects exhibit different socio-economic characteristics than households who do not (Pillai's trace F-statistic = 4.712; df 30, 44; p-value < 0.0001).

Total income accounts for approximately 30% of the difference ($R^2 = 0.27$), followed by total landholdings and the amount of forested hectares on these landholdings ($R^2 = 0.05$). Finally, dependency ratio and total assets value respectively explain 3% and 1% of the difference. Finally, household size, labor availability, income derived from farming

activities, the amount of land devoted to pasture, fallows and crops, and diversification of income sources do not relate to the decision of participating in carbon-related projects.

Discussion

Socio-Economic Changes in Rural Communities of Panama

Only a few researchers have considered the socio-economic changes that have occurred in rural Panamanian villages. Gloria Rudolf, an anthropologist at the University of Pittsburg, is one such researcher that has been working with the Panamanian community of Loma Bonita on and off since 1961. The story of this community is one which elaborates on the changes that occur with increasing integration into the globalized economy. Between 1961 and 1972 she found that the percent of migrants aged 12 to 50 rose from 46% to 72% percent of the total community (the majority of whom were women), as families would send more members away to the city to work. Rudolf (1999)

of Chepo, Torti or Curti. Additionally, even the poorest of households had at least one cell phone. While frequently they had no money on the phone they were still able to receive calls, an indicator of wanting to stay in touch with family abroad.

Rudolf's work on "Post-invasion invasions: Global economy in rural Panama" (1999) further highlights the important social and economic changes which have recently occurred in Panama following the departure of the U.S. government. In short, while some sectors of Panama have profited Rudolf has found that "there has been a reinforcement of previous trends toward greater unemployment and underemployment, [and] higher prices". Ipetí certainly has experienced some of these changes. The rising price of basic necessity, especially food, has been identified as the single major change since 2004 by community members through informal conversations. Indeed there are signs of consumerism and connection to the global economy everywhere as the young often where trendy clothing and the rich often own televisions. So expenditures on

Possible benefits	Possible risks
Natural assets • Higher forest values due to improved management and market opportunities • Positive spin-offs for other natural assets: soil fertility, pollination, water flows and quality	• Lost use values (timber eg) if harvesting restrictions are imposed, and lost options for forest conversion to agriculture • Negative spin-offs for other natural assets, for example forest-based predators.
Human assets • Education and training: forest and project management, enterprise development, negotiations • Improved health: from better water supply, higher household income	• The poor capture few educational and skills development opportunities
Social assets • Strengthening of community-based institutions • Protection of forest-based cultural heritage • Increased visibility and representation of community vis-à-vis government, donors…	• Erosion of cooperative arrangements due to increased inequality • Markets and commercialization undermine local value system
Financial assets • New income from sales of environmental services • Higher income from forest-related sources: fuelwood, timber, ecotourism • Improved security and stability of income due to diversification	•

constitute most of their landholdings. As such, high start-up costs, lump-sum payments, high labour demand and production risks that often characterize reforestation projects represent a risky investment for asset-poor households (Grieg-Gran et al. 2005, Coomes et al 2007). Avoided deforestation would hence be a more plausible and viable alternative although the fact they often own less forest may limit their ability to participate. Moreover, no additional costs are incurred, no additional labour is needed and the land retains its positive insurance value, while payments are received every year (

analysis confirms that landownership, and particularly the amount of forested hectares, influence the willingness and above all the possibility to participate in carbon-related projects. The statistical significance of this factor may stem from sampling: indeed, four of the 7 households in the carbon group sample participate in avoided deforestation. Hence, "heterogeneity in livelihood strategies and uneven asset endowments among households– factors often overlooked in the ongoing carbon and sustainable development debate – are expected to strongly affect household participation (Tschakert 2005: 817)" and this may have an impact on already-increasing inequalities, as better-off households will earn more.

Nevertheless, it should be noted that carbon-offset projects may have spill-over benefits on the community of Ipetí-Emberá, such as increased environmental integrity and services, training and education. Further, STRI-OUDCIE contract has been designed in such a way as to maximize benefits to the whole community and to encourage as much as possible participation from lower-income households. First, while households will receive 80% of the total payments per hectare, 20% of the gains will be pooled in communitarian fund. Projects, voted by individuals who participate in the agreement, will be implemented with this money. Second, as for reforestation, STRI engaged itself to finance part of the start-up costs, which remove an impediment to asset-poor household participation. Finally, yearly avoided deforestation payments provide the flexibility needed for poorer-households, even though they have to commit at least one hectare and land availability may still be a restrictive factor.

Conclusion and recommendations

Increased market integration and outside influences have opened new "windows of opportunity" to the people of Ipetí-Emberá. This is highlighted by the socio-economic changes that the community has experienced from 2004 to 2008 that resulted in positive and negative environmental impacts. The window of opportunity opened by the increased involvement of the international and national community is one of the most significant one in terms of its environmental and social impacts. However, our study has shown that there are differences in willingness and possibility to take advantage of these opportunities by different resource-endowment groups. This constitutes an ethical and technical challenge that requires further research and monitoring, as more and more carbon-offset projects are implemented in the community.

A more comprehensive understanding of the socio-economic dynamics of carbon-offset projects adoption could be acquired through further monitoring, questionnaires and analysis, complemented by focus groups comprised of stakeholders from different resource-endowment groups on the advantages and disadvantages of such projects. Key concerns and opportunities hence could be identified and a land management plan designed accordingly. In any cases, the importance of the diversification of strategies should be recognized. Reforestation and avoided deforestation projects could be designed in such a way that encourage as much asset-poor household's participation as possible, and could be complemented by sustainable agro-forestry practices and the increasing of non-farming economic opportunities; most of these possibilities are already under consideration and/or implemented on a small-scale and further research and monitoring is needed on the socio-economic aspects, as this study demonstrated.

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We would like to express sincere thanks to all the persons that made this project possible, namely: OUDCIE, particularly President Jeremia Cansarí and Vice-President Bonarge Pacheco, for having been so welcoming and helpful during our stay in the community. Shara Samana and Melina Cansarí for their availability and help with the adaptation and the execution of the questionnaire, your knowledge of the language and of the community were essential.

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