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REDD+ Piloting Processes and Impacts

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Experiences from pilot projects in
Brazil, Democratic Republic of Congo,
Tanzania and Uganda

by

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Contents

Summary	5
The established governance structures	5
The process of setting up REDD+	7
The costs of establishing REDD+	7
Impacts	8
List of abbreviations	9
What is REDD+?	11
The Mana_Forest Project	12
The governance structures established in the pilots	16
Clarification of property, use and management rights	18
Management systems and rules	21
Validation and access to the carbon market	25
Payments	26
The process of introducing REDD+ and establishing REDD+ governance structures	28
The costs of establishing and using REDD+ governance structures	34
The impacts of REDD+	39
Effects on deforestation and forest degradation	40
Effects on livelihoods and income	43
Appendix	46



Summary

REDD+ is an incentive-based system to facilitate reduced deforestation and forest degradation. This report documents experiences with establishing REDD+ ‘on the ground’. More specifically, it synthesizes knowledge from seven REDD+ pilot projects in South America (Brazil/State of Amazonas) and Africa (the Democratic Republic of Congo [DRC], Tanzania and Uganda) regarding the following aspects:

- a) what governance structures have been established to foster reduced deforestation, for the various pilot projects.
- b) the quality of the process of implementation with specific focus on local participation and possible conflicts
- c) the costs of planning, establishing and managing the projects
- d) the impacts of the pilot projects on livelihoods and forest ecosystems (especially deforestation rates and biodiversity)

Focusing on these four elements, we offer insights about the most important aspects of REDD+ piloting as it has been developing in various contexts. We have chosen to concentrate on projects that involve some form of community management. The basis for the analyses is interviews with approximately 1500 households – (many of which were visited twice), – more than 80 focus group sessions and numerous resource-person interviews at village, district and national levels.

The established governance structures

Establishing REDD+ at the local level preconditions a series of institutional changes. Property/use rights need to be clarified. In case of community forests, common management rules must be defined. Access to e.g., carbon markets has to be established, and systems for internal distribution of payments to those living in the communities must be created.

The projects in Brazil (2) and Tanzania (2) started in 2009/2010. The pilot in Uganda has a history dating back before the start of REDD+ piloting, focusing on carbon offsetting. The DRC pilots (2) started in 2013. In the case of fully established projects, the creation of governance structures took between one and three years. The Brazilian program was least time consuming in this respect, partly because at that time, it had already been developed as a somewhat ‘off the shelf’ type of program. The pilots in DRC have experienced serious delays – not least due to delays in dispersion of funds to the project developer. There were also delays in the Ugandan pilot, mainly due to a serious conflict over land demarcation.

Property rights

Establishing property rights is key to REDD+ as it is the basis for defining who is responsible for reducing deforestation and being eligible for compensations for lost income. Property or use rights were unclear or disputed in all African pilots. Organizers of pilots utilized the fact that in these countries, decentralization had become a key direction for forest policies, laying the ground for the establishment of community forests. Defining village/forest borders created conflicts in most cases. It was also time consuming and is yet not finished in the DRC pilots. The latter case also reflects the fact that there is serious competition between the institutions of statutory and customary law. The existing property rights regimes are generally unfavorable to women and migrant communities.

In the Brazilian case, pilots are positioned within land that is already conserved and owned by the state. While many villages are included in each pilot, no delimitation of forests per village has been found necessary. This has influenced the way management rules and payments are structured.

Management systems

In all pilots – except in the DRC – restrictions have been defined on various uses. This includes limitations on converting forests to agricultural land, collection of fuelwood, making of charcoal and logging. There is a mix of prohibitions and permits, the latter often issued against a payment. In some cases, a distinction is made between the protection and use of forests. In the utilization zones, a permit system is typically established. Project organizers try to introduce sustainable use of forest resources – e.g., charcoal making – and tree planting. In Tanzania, the establishment of protected forests has resulted in the relocation of some households. In Uganda, some agricultural land has been converted back to forests. There are serious challenges with regard to controlling that rules are abided by.

Access to carbon markets

The pilot projects are predominantly funded by public money. Regarding funding beyond the pilot period, project organizers in Tanzania and Uganda have aimed to enable villagers to sell carbon in international markets. A key idea has been to create a common organization across villages to reduce transaction costs and ease market access. This process has been demanding, both technically (validation, etc.) and organizationally. The fact that carbon prices are very low has also been a challenge. In Brazil, the pilot organizer has managed to access private funding while outside the formalized market for carbon credits.

Payments

Payments have been made in the Brazilian and Tanzanian pilots. Whilst REDD+ has been defined as performance-based, none of the payments have been based on actual reductions in deforestation. The Brazilian system studied (the ‘Bolsa Floresta’ program) is the most developed. The basis is a yearly payment to each female family head for agreeing to follow a set of restrictions on e.g., logging and agricultural expansion. This contract releases further payments to communities. In Tanzania, only ‘trial payments’ have been made, and only once. One pilot paid to the communities while the other paid directly to individuals. In that case, communities favored equal payment to all. This was based on the perception that those using forests the most created individual wealth from using a common resource. There was discontent with the level of payments, even in Brazil where levels were much higher than in the Tanzanian case. The time limitation of most pilots is a great problem given that REDD+ finances are not secured for the future.



Community meeting on the allocation of Bolsa Floresta funds

The process of setting up REDD+

The process of setting up REDD+ governance structures has been demanding in most pilots. It has been time-consuming at both planning and implementation stages, and it has created some conflicts regarding land allocation and restrictions on access to resources. Generally, REDD+ has been introduced through open meetings. Participation has been decided by the local people – in the African cases, typically by village general assemblies. In Brazil, the decision to join was an individual one made by female household heads. Some issues are observed regarding the capacity to reach out to all. Processes have generally been quite transparent, while information has largely come from the pilot organizers. Given this, there is no surprise that the level of trust in these organizers is important for the appreciation of the project. There is a tendency that organizers emphasize the potential gains from REDD+. Uncertainties seem to be under-communicated, particularly in cases where uncertainty is high. Evaluations of the REDD+ pilot projects by inhabitants vary substantially. Expectations regarding payment level seems to be as important as the level of restrictions and the actual payments, for the local appreciation of REDD+.

The costs of establishing REDD+

Costs of establishing and using REDD+ governance structures have been calculated for both of the Tanzanian and for one of the Brazilian pilots. Costs seem rather high, i.e., in the order of 2-3 times the present carbon prices, if we assume reductions in deforestation following prognoses in project documents. Note that opportunity costs are not included, only costs for setting up structures, training activities, continuous decision making and payments. The structure of costs vary. In the Brazilian case, the cost of establishing the system was low compared to Tanzania. This seems to reflect the tenure situation as well as the fact that the organizer had gained experience from prior introduction of the Bolsa Floresta program in other areas of the Amazon. The rather high costs of running the project in the Brazilian pilot compared to the Tanzanian, reflects both the fact that this program has much emphasis on training and developing income opportunities – an effect of its high emphasis on rural development as well as carbon sequestration – and the fact that it has been operating for a longer time than its counterparts in Tanzania.

Impacts

Possible impacts of REDD+ on deforestation and livelihoods are analyzed using a 'before-after-control-impact' approach.

Effects on deforestation

REDD+ appears not to have significantly changed deforestation rates in the pilots analyzed, two in Brazil and two in Tanzania. There may be a positive effect in one of the pilots in Tanzania. Forest cover changed much more in the Tanzanian compared to the Brazilian pilots. Uncertainties are, however, also greater in Tanzania as forest degradation is more important relative to deforestation and the former is more difficult to study. Results were influenced by droughts, which occurred in all pilot areas in 2014.

Effects on livelihoods

REDD+ appears not to have had a significant effect on the level of income in this short study period. There were severe income reductions in the Tanzanian pilots between 2010 and 2015. These were, however, caused mainly by a drought, which influenced pilots and controls equally. Incomes were reduced in the Brazilian pilot studied, the APA Rio Negro. The main reason for this was a reduction in government transfers.

The results regarding impacts of REDD+ are influenced by the fact that REDD+ has been operating for just a few years. Changes in forest use seem to demand rather profound shifts in the way people make their living. This requires sustained efforts, and success is not guaranteed. The fact that REDD+ has no sustainable financial basis for the years to come could imply that investments made in institutional change, to facilitate a shift in deforestation trends, could be wasted. In our case, only the Brazilian pilots have a secured financial basis for the future. At the same time, we note that the clarification of property rights undertaken strengthens the position of the communities involved.

List of abbreviations

APA	Environmental Protected Area (in Portuguese: Área de proteção ambiental) – a type of conservation unit in Brazil
AWF	African Wildlife Foundation
BACI	Before-after-control-impact
CBFM	Community based forest management
CLA	Communal Land Association
COP	Conference of the Parties – in this case to the Kyoto Protocol (under UNFCCC)
DRC	Democratic Republic of Congo
FAS	Fundação Amazonas Sustentável
JFM	Joint forest management
LDC	Local development committee
MJUMITA	Community Forest Conservation Group of Tanzania
NGO	Non-governmental organization
REDD+	Reduced deforestation and forest degradation
RDS	Sustainable Development Reserve (in Portuguese: Reserva de Desenvolvimento Sustentável) – a type of conservation unit in Brazil
R\$	Brazilian reais
tCO ₂ e	Ton CO ₂ equivalents
TFCG	Tanzania Forest Conservation Group
TGB	Trees for Global Benefit
UNFCCC	United Nations Framework Convention on Climate Change
USD	US dollar
WHRC	Woods Hole Research Center



What is REDD+?

REDD+ (reduced emissions from deforestation and forest degradation) became an issue in climate negotiations after 2005 when Costa Rica and Papua New Guinea introduced the idea at the UNFCCC Conference of the Parties (COP) in Montreal. According to the Stern report (Stern et al. 2006), it was suggested that almost one-fifth of global carbon emissions came from land use changes, largely attributed to deforestation in tropical regions. This resulted in an increased momentum to include deforestation and forest degradation as part of the international climate change negotiations. Such a formal inclusion took place at the COP at Bali in 2007. Since then, the international community has supported processes for establishing REDD+ in a large number of developing countries. This includes the establishment of national strategies as well as local pilot projects. The latter regards projects to gain experience on how to create the necessary institutional changes, as well as to gain insights into the potential impacts of REDD+ on deforestation rates and livelihoods. Whilst REDD+ is about reduced emissions of carbon from forests, the basis is in changes in forest policies and institutions governing the use of forest resources.

This report documents experiences with the introduction of REDD+ at the local level through pilot projects. More specifically, it synthesizes knowledge from projects in South America (Brazil) and Africa (the Democratic Republic of Congo, Tanzania and Uganda), obtained through the Mana_Forest project.

The Mana_Forest Project



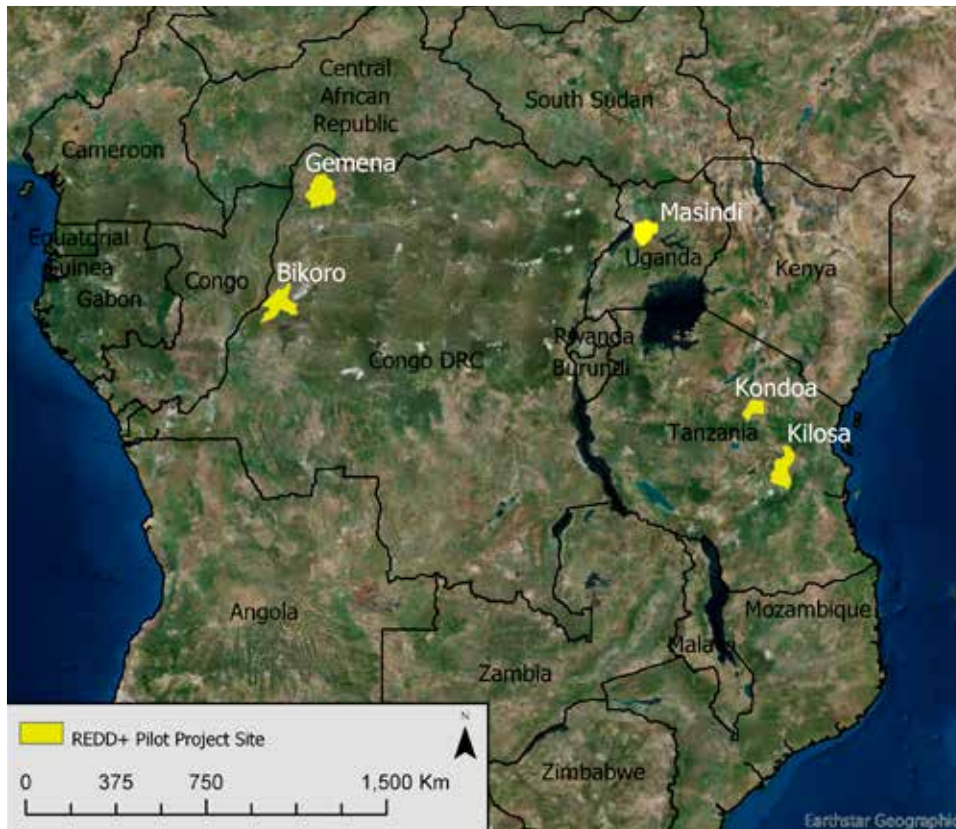
Establishing REDD+ locally raises a series of questions: Do local people support the introduction of REDD+? What changes in governance structures are necessary? Have the processes been inclusive and have people been treated in a fair way? Is REDD+ effective? What does it cost? Questions like this formed the basis for the project 'Man and Forest – an evaluation of management strategies for reduced deforestation and forest degradation (Mana_Forest)' financed by the Norwegian Research Council (2014-2016). This report covers the main findings from this project.



Slash and burn forest clearing in the Gemena pilot

The project is led by the Department of International Environment and Development Studies at the Norwegian University of Life Sciences. Partners include Fundação Amazonas Sustentável (FAS), Makerere University, Sokoine University of Agriculture and Woods Hole Research Center (WHRC). The project has also drawn upon material collected by the project 'Poverty and sustainable development impacts of REDD architecture: Options for equity, growth and the environment' led by the International Institute for Environment and Development in cooperation with the Norwegian University of Life Sciences (2010-2013).

REDD+ Pilot Sites in Africa



REDD+ Pilot Sites in the Amazon



The primary objective of the project has been to evaluate different management strategies to obtain reduced deforestation in tropical forests and hence maintain the various ecosystem services delivered. More specifically, the project has aimed at comparing a set of REDD+ pilot projects concerning the following aspects:

- a) what governance structures have been established for the various pilot projects to foster reduced deforestation
- b) the quality of the process of implementation with specific focus on local participation and possible conflicts
- c) the costs of planning, establishing and managing the projects
- d) the impacts of the pilot projects on livelihoods and forest ecosystems – especially deforestation rates and biodiversity

The project has studied seven pilot projects: two in Brazil (Amazonas), two in the Democratic Republic of Congo, two in Tanzania and one in Uganda. The pilots are mainly focused on community forests, in several of the cases with an unclear or disputed property right's situation at the outset. Five of the pilots have been managed by NGOs¹ and two are organized by a research institute in cooperation with local NGOs (DRC) – see Box 1.

The findings presented are based on a comprehensive set of data collected in the period 2010 – 2016. It includes two household surveys interviewing 200 household heads in each pilot area – one before the REDD+ pilot projects were established and one after the pilot period was finished. The main focus of the surveys was to document livelihoods and attitudes to forest/land governance and REDD+.² They include data from both pilot villages and neighboring villages with no REDD+ initiatives to facilitate impact evaluations. The team also undertook a

substantial number of focus group discussions with inhabitants and semi-structured interviews with local resource persons. There was separate data collection for the process part (as defined in point b above) including similar types of instruments. This latter study included only REDD+ pilot villages. The analyses of costs are based on data from the accounts of project organizers and interviews with project managers and people living in the villages. The impact analyses are based on livelihood data from the household surveys as well as GIS data from the period 2000 to 2015 (5 year intervals) to assess if there were any changes in trends of income and deforestation.

Box 1 The pilot projects studied

Brazil: The Bolsa Floresta projects in APA Rio Negro and in RDS Rio Negro in the State of Amazonas; implemented by Fundação Amazonas Sustentável (FAS). FAS is a non-profit private foundation with resources from the State of Amazonas, Bradesco Bank, the Brazilian Development Bank, and various private sponsors (e.g., Coca Cola, Samsung, Marriott). This arrangement, together with some resources from the Amazon Fund has supported REDD+ activities. About 550 people live in 8 villages in the APA and about 2 250 people in 19 villages in the RDS.

Democratic Republic of Congo: Pilots in the Bikoro and Gemena Districts in the Equateur Province; managed by the Woods Hole Research Center (WHRC) in cooperation with local NGOs. The project is funded by the African Development Bank. About 2 500 people live in two villages in the Bikoro pilot and the situation is about the same in Gemena.

Uganda: The Ongo community forest pilot in the Masindi District, managed by Ecotrust. While the project is not formally defined as a REDD+ pilot, it focuses on carbon offsetting. The project is financed by MyClimate (a non-profit climate protection organization based in Switzerland). Around 2 000 people live in 4 villages bordering the Ongo forest.

Tanzania: The Kilosa district pilot; managed by the Tanzanian Forest Conservation Group (TFCG) and the Community Forest Conservation Network of Tanzania (MJUMITA). About 25 500 people live in 13 villages. The Kondoa district pilot; managed by African Wildlife Foundation (AWF). About 40 000 inhabitants live in 17 villages. Both projects have been financed by the Norwegian government.

1 The organizer in Brazil – FAS – may also be seen to resemble that of a Trust Fund.

2 The pilot in Brazil is still ongoing, while the pilots in DRC and Uganda have been delayed and we have not been able to undertake impact analyses there – including a second round of household surveys.



The governance structures established in the pilots

REDD+ has been presented as performance-based. This implies that forest owners should be paid for the amount of carbon stored above a business-as-usual base line. Somewhat simplified, REDD+ therefore demands four governance issues to be clarified: a) who owns/should own the forest (carbon)/has use and management rights; b) which management system and rules should be introduced to govern forest management to ensure increased carbon storage; c) how should carbon developments be measured and validated; and d) how should payments be ensured and distributed.

These are demanding issues, and planning and establishing the necessary institutional structures to facilitate all of the above has been quite challenging. In the following, we will give a brief overview of the strategies and outcomes for each pilot project. Note that, by the summer of 2016 only three pilots have been set up largely as planned by the managers – i.e., the RDS Rio Negro, the Kilosa and the Kondoa pilots. While the projects in Brazil have a long-term basis, the Kilosa and Kondoa pilots are terminated. They had funding only for the pilot period. Both these projects planned to enable villagers to enter the carbon market after the five-year pilot period ended. In Kondoa, validation is completed, while no trades have been made. TFCG is awaiting carbon prices ‘to recover’ before completing validation.



Deforestation along the road, Kondoa

In the Ongo pilot, the process has been much delayed due to a conflict over property rights/forest demarcation. A land title is recently issued to a community association and the project manager has come quite some way in ensuring validation for entering the carbon market. In the APA Rio Negro, there has only been a partial introduction of the program due to funding issues. Regarding the two pilots in DRC, they were established later than the others (in 2013), and the establishment has been further delayed, not least due to issues regarding the challenge of handling the complex and rather dysfunctional donor implementing agency (African Development Bank) administrative system. This has led to delayed disbursements of operational funds to the executing agency (WHRC).

The findings of our research sheds light on a series of issues that we consider to be typical for the introduction of a program such as REDD+ in countries in the tropics. Whilst all pilots are managed by ‘external’ actors (mainly NGOs) and not by public authorities, the strategies followed are nevertheless much influenced by existing institutions and programs in the actual states regarding property rights clarification and forest management.

Clarification of property, use and management rights

Main findings:

- Property and use rights have been unclear or disputed in 5 out of 7 pilots. Clarifying these has been a key issue.
- It has been a time-consuming process, and clarification of rights is not yet completed in all cases.
- It has strengthened the position of communities, whilst also creating conflicts.
- The processes have been highly dependent on national and sub-national laws and capacities as well as local conditions.

Clarification of rights to land has been a key issue in all pilots except the Brazilian ones. Starting with the Tanzanian pilots, we find that they are both based on the official strategy for participatory forest management as defined in the 2002 Forest Act. Tanzanian forests are divided into three regarding property rights: government reserved forests, general land and village forests. There has been substantial conflict concerning community access to reserved forests, which is in principle prohibited without a joint forest management agreement. Moreover, the distinctions regarding general and village land are differently drawn in the Land Act and the Village Land Act. The controversy regards the status of customary rights – whether village land rights have to be formalized to be acknowledged. The lack of clarity here and the fact that the public capacity to manage general land is very low has resulted in a large fraction of Tanzanian forests being under *de facto* open access.

While the Kilosa pilot was focused on establishing community forests under community-based forest management (CBFM), the Kondoa pilot was mainly oriented at establishing joint forest management (JFM) as the largest forests in the area were government forest reserves. The Kilosa case had strong emphasis on establishing certified village borders, implying a redefinition from general land/unacknowledged village land to

statutory village land. This was in accordance with the aims of the 2002 law, while the process of establishing village forests had been slow in Tanzania – partly due to lack of resources, but also due to administrative resistance. While village borders, management plans and by-laws for forest use were completed in the Kilosa pilot villages by 2012, official approval by the Commissioner of Lands was first obtained when the project closed in 2014. The process at local level created some conflicts. In one village, some households had to relocate, while three of the 12 villages and one village adjacent to the pilot area were involved in border conflicts.

In Kondoa, formalized village borders were established prior to the REDD+ project. The main focus of the pilot was on developing the JFM contract with state authorities – including the creation of management plans and by-laws for these forests. CBFM management plans and by-laws were also developed in cases where villages had ‘village forests’ (six out of 18 villages that completed the process). While there were no border conflicts, the fear of land grabbing was strong in several cases and two of the invited villages did not engage in REDD+. It is notable that the Kondoa pilot was, to some extent a continuation of existing engagement by the responsible NGO (African Wildlife Foundation [AWF]) in parts of the area.

The process regarding the Ongo community forest in Uganda is in many ways



CLA meeting, Ongo

Box 2. Institutional conditions prior to the establishment of the pilot projects

Brazil:

1. APA Rio Negro: The forest is owned by the state. An APA – Environmental Protected area was established in 1995.
2. RDS Rio Negro: The forest is owned by the state. The RDS – Sustainable development reserve was established in 2008. Both forms of conservation units imply some restrictions on use of forest resources. We also note that logging in Brazil demands an approved management plan.

Democratic Republic of Congo:

1. Bikoro: The forest is owned by the state, while statutory and customary law operates in parallel. In practice, regulations of forest use is based on customary law except for logging. Access to agricultural land can be obtained through either of the two legal systems
2. Gemena: As in Bikoro, while customary law is still very strong in Gemena compared to Bikoro.

Uganda:

1. Ongo: The Ongo forest was regarded as public land (owned by the state), managed by the Masindi District land board. The community was unclear about the access and use rights of such a resource and therefore accessed and used the forest without restrictions.

Tanzania:

1. Kilosa: Forestland was on general land (state ownership) while communities considered it theirs under customary law. *De facto* under open access.
2. Kondoa: Most of the forestland was in government reserves, some on village land. Previous project that had tried to protect forests mainly through destocking.

similar to the Tanzanian case. The policy basis was the Land Act (1998) and National Forest Policy (2001), which favors decentralization such as that in Tanzania. The establishment of the Ongo community forest is the first of its kind in Uganda and the process had started already in 2003. Ecotrust began their work in the area in 2007, emphasizing CBFM. The REDD+ project can be seen as a continuation of that engagement, but was severely halted due to a conflict over the demarcation of the community forest. Leaders in one of the four involved villages strongly opposed the proposed delimitation. Despite prior state ownership, tracts of the forest had been trespassed (mainly through expansion of agriculture/tobacco) and people claimed private ownership to areas within the proposed borders. The process has been completed and in early 2016 a freehold land title was issued in the name of Ongo Communal Land Association (CLA). Gazettement is, however, awaiting final approval by the District Council. It is notable that the CLA is an independent membership organization. This differs from the Tanzanian case where the village is the owner of village forests, and the village assembly appoints who participates on their behalf in the community organization established for JFM. At present, a rather small number of the villagers surrounding the Ongo forest are members of the CLA.

In the case of DRC, the existence of competing legal foundations for land allocation is even more pronounced than in the above cases. The state law defines all forests as state property, distinguishing between classified forests, permanent production forests and protected forests. The latter are in practice under a system of customary governance, based on tribal rule accepting some use rights and conversion of forests to e.g., small-scale farming. Statutory and customary laws are, however, not harmonized. This incoherence has created a situation with competing authority structures – the state vs. the tribal authority – opening up the opportunity for powerful people to ‘shop’ between the two systems. Moreover, DRC lacks a functional local government. While the 2006 Constitution and the decentralization reform makes the necessary provisions, it does not yet function below the province level – e.g., at district and village levels. The existing property rights structures in DRC pilots are unfavorable to women and migrant communities. This is a situation also observed in the other African pilots.

Like in Tanzania and Uganda, there is an aim to decentralize forest governance. The law on community forests from 2014 opens up for establishing local management rights of forestland within the statutory system (25 years duration). This makes it possible to formally recognize customary rights, but there are not yet any approved procedures for how that should happen. It is also unclear who has the authority to approve the establishment of such rights.

In this situation, the project developer (Woods Hole Research Center), like other REDD+ pilot project organizers in DRC, have had to facilitate the establishment of ‘a substitute’ for local government in both pilot areas. This is in accordance with the law demanding that if no local government is in place, a project like REDD+ must establish a local development committee.

A participatory mapping exercise was conducted in the Bikoro pilot in 2013-2014.



In spite of the ‘zero grazing’ rule, animals are brought out to pasture, Kondoa

Borders were defined, while some issues came up with neighboring villages. These were negotiated and resolved by the villagers. In the next phase of the project, the communities will validate these maps as a step in the process for legal recognition. However, the competent authority to undertake such recognition is not clearly established. No mapping has yet been done in Gemena.

For the Brazilian pilots, the issue of property rights was not an issue. There are also challenges regarding land ownership in Brazil, while the situation is gradually improving with the launch of the program Terra Legal in 2009. However, both pilots included in our project were established within already protected areas where the land is state owned. As Nature Conservation Units – a national system of area protection established in 2000 with the addition of subnational system created in 2006 – they are both part of the sub-category Sustainable Use Units. Limitations on use are somewhat more restricted in the RDS than in the APA. There are many villages in both areas, while forests are vast and there seem to have been no need to define formal internal borders between the various villages.

Management systems and rules

Main findings:

- REDD+ has implied development of rules for restricted/managed use of forest resources – e.g., limitations on conversion of forestland to agriculture, charcoal making, collection of fuelwood, logging and grazing.
- The content of these rules was largely determined by local needs and ecosystem characteristics.
- Some pilots differentiate between protected (REDD+) forests and utilization forests.
- Sustainable use (logging and charcoal making) is instituted in some pilots.
- There are serious challenges regarding ensuring that rules are abided by.

Most pilot projects have defined a set of restrictions on the use of forest resources, including regulations of agricultural expansion. Exceptions include the DRC pilots, which started late and are much delayed. Beginning with Brazil, we note that the federal state shifted its focus from less extraction to more protection around the turn of the century. Many of the actions to ensure forest protection has still been dependent on the engagement of states. In that respect, the State of Amazonas and Bradesco Bank created the Fundação Amazonas Sustentável (FAS) in 2007. It was designated to undertake investments to improve the quality of life of local populations and the conservation of forests in protected areas in the state by the implementation of a state-owned payment scheme for environmental services called Bolsa Floresta. Since 2008, FAS was authorized to manage and implement the program together with the State of Amazonas (i.e., State Secretary of Environment).

Brazilian laws have restrictions on logging activities. Both ‘sustainable logging’ (i.e., logging at a level that maintains the forest stand) and ‘self-sufficiency’ (i.e., household and community constructions such as community centers and churches) can be licensed through forest management plans. What Bolsa Floresta adds is that those who join the program must sign an agreement stating that they abide by the rules of the management plan of the protected area, control fires and do not expand agricultural land into primary forests without any proper justification. There are also other rules included such as sending children to school. This gives the signatory (female household head) the right to receive a monthly payment.

Box 3. Forests and forest use

Brazil:

1. APA Rio Negro: Dense ombrophylous rainforest mix with flooded forests and pioneer formations. Proximate drivers: shifting cultivation, illegal logging, real estate exploitation.
2. RDS Rio Negro: Dense ombrophylous rainforest mix with flooded forests and pioneer formations. Proximate drivers: shifting cultivation, illegal logging, real estate exploitation.

Democratic Republic of Congo:

1. Bikoro: Dense humid equatorial rainforest mix with swamp forest. Proximate drivers: shifting cultivation, logging, charcoal production.
2. Gemena: Lowland dense humid equatorial rainforest mix with evergreen savannah woodland and grasses. Proximate drivers: Similar to Bikoro.

Uganda:

1. Ongo: A riverine tropical forest. Proximate drivers: Clearing for cultivation and harvesting of poles.

Tanzania:

1. Kilosa: Miombo woodlands and sub-montane tropical forests. Proximate drivers: Clearing for agriculture, firewood collection, charcoal production, timber production and bush fires.
2. Kondoa: Dominated by miombo woodlands. Proximate drivers: Similar to Kilosa, while grazing also plays a role in Kondoa.



Household settlement in Bikoro

Restrictions on logging and agricultural expansion are issues raised in the Tanzanian and Ugandan pilots, too. However, the pilots have typically defined restrictions also on firewood collection and charcoal making, sometimes also on grazing. These are practices not found in the Brazilian pilots. Both of the Tanzanian pilots developed land use plans with attached by-laws based on the national rules for participatory forest management (CBFM/JFM). In Kilosa, areas were designated to different uses, including defining what should be reserved villages or 'REDD+ forests' and which were for use. Forest management plans and by-laws were created. These typically varied across villages dependent on the situation. By-laws defined utilization that did not demand prior permission; utilization demanding permits, but no payment; utilization demanding permit with payment; and finally activities not allowed. Farming, grazing and setting fire within forest reserves were generally not allowed. Village by-laws typically prohibit both timber-harvesting and charcoal making, while some villages demarcating areas for protection and utilization seem to have allowed (sustainable) charcoal making and timber harvesting against a paid permit in utilization zones.

The system for Kondoa is somewhat similar, even with most of the forest within state forest reserves. Compared to Kilosa, there has been more focus on limiting grazing as cattle herding is much more important in Kondoa. Both pilots established control systems, implying that community members undertook patrolling. In the forests under JFM (Kondoa), this was made in cooperation with state authorities (the district and Tanzania Forest Service).

In Ongo, by-laws to guide access to resources were drafted and approved during an annual general meeting in 2007. The rules include the requirement to obtain written permission against a fee before accessing products such as charcoal, sand and poles; women can only gather firewood and vegetables on Wednesday and Saturday; timber harvesting, bush burning, hunting and raising tobacco beds in the forest is prohibited and offenders are to be fined or tried in court. The entire community, including non-CLA members, has rights of access to non-timber products from the forest including vegetables and fibers.

There seem to be serious challenges in controlling that rules are followed. The areas of the forests involved are typically large. There are



Firewood stored outside the household, Kondoa

limited resources for monitoring both at the village and higher levels (e.g., district). Given this, the general legitimacy of REDD+ and its aims in the involved communities will be key for its success.

The institutional changes in the pilot areas were accompanied by organizational change. In the Tanzanian pilots, the establishment of a village natural resource committee was demanded by the law, as part of participatory forest management. Elections were held at village general assembly meetings. In some villages, such a committee already existed. In Kondoa, a common organization for all villages bordering the state forests – JUHIBECO – was established to make it possible to create a JFM contract. In Brazil, the creation of an association for each pilot area was part of the program to strengthen community participation. The election of its board and president was held in a common meeting where people from the involved communities were invited and every head of a registered household could vote. Such a meeting also decided on the rules of the association. In Ongo, we have already seen that the process of establishing community property rights

demand the establishment of a community land association (CLA). It is led by a CLA committee with the mandate to manage the forest. This committee is also responsible for distributing revenues from the permits among the four villages. The committee oversees boundaries, tree planting in the forest, guide meetings and is mandated to resolve conflicts. Also in the DRC, the establishment of REDD+ demands the creation of functional management and implementation organization in each village. This implied the establishment of ‘a substitute’ organization in a situation with no effective local government. – the local development committee (LDC) (see above) – led by an executive committee. The LDCs were established based on elections, with household heads being the electorate. We note that in Bikoro the village customary chief also became president of the LDC. In Gemena, the community elected one of the customary land-owners. This seems to have been a way to ‘harmonize’ the democratic /formal and customary institutions in the process of implementing REDD+.



Charcoal trader at Kilosa town market, Kilosa

Validation and access to the carbon market

Main findings:

- Three of the pilot organizers have worked on establishing the basis for entering the carbon market through standard validation processes.
- Demanding procedures and low carbon prices have made this strategy difficult.
- One of the organizers has established a financial basis for continuation of the pilots based on a mix of public and private funding. This has created a more stable basis.

Three of the pilot organizers have been engaged in making the communities able to enter carbon markets. This regards Kilosa (Tanzanian Forest Conservation Group [TFCG] with the Community Forest Conservation Group of Tanzania [MJUMITA]), Kondoa (AWF) and Ongo (Ecotrust). This has been a demanding process. While validation is completed in Kondoa and Ongo, none of the pilots has entered the carbon market. Low prices also play a role.

It may seem quite demanding to make communities in the present contexts enter this market. To fulfill the technical demands is one aspect. Another regards low/volatile carbon prices. Finally, finding interested buyers and doing the transactions is also challenge. The solution to this latter problem developed by TFCG/MJUMITA is worth emphasizing. It is based on the establishment of a so-called 'carbon enterprise', functioning

within the community network MJUMITA. The idea has been to build an organization that has the competence to trade carbon credits including the necessary validation, monitoring, reporting and verification components. It also ensures a way to aggregate emission reductions across villages to increase volumes to be traded and hence, reduce transaction costs.

None of the other pilot organizers had, at the outset, plans to support communities in entering the carbon market. FAS has, however, attracted a substantial amount of resources from public and private actors who support the Bolsa Floresta program either directly or via their customers. Moreover, FAS has been instrumental in ensuring that the State of Amazonas has issued its first carbon certification for a private partner (Marriott) in 2015. This regards reductions in the RDS Novo Aripuanã, which is another of the Bolsa Floresta Program sites.

Payments

Main findings:

- Payments have not been performance-based, but some have worked towards such a solution.
- Only half the pilots have reached the stage of payments.
- Low carbon prices imply low payments.
- Payments introduced are partly individual and partly directed at communities
- Local values and norms influenced the format of payments.
- The limited time-frame for most pilots is problematic as future REDD+ finances are not secured.

Payments have been made in several of the pilots, even if none has been strictly performance-based. The Bolsa Floresta program is the most developed regarding payments. It has a strong focus on community development in combination with forest protection. The program has four components that all involve payments:

1. *Bolsa Floresta Familiar* – or Family Component: A monthly payment of R\$ 50 (R\$ 600 yearly) to the mother/female head of each family. Eligibility for payment demands signing an agreement on e.g., reduced deforestation (see above).
2. *Bolsa Floresta Associação* – or Association Component: An investment destined for the associations of communities in the protected area – an average of about R\$ 60 per family per year.
3. *Bolsa Floresta Renda* – or Income Generation Component: Supports economic activity that follows defined sustainability criteria. Each community receives about R\$ 400 per family contracted under the Family Component per year.
4. *Bolsa Floresta Social* – or Social Component: Supports improvements in education, health, communications and transport,

which are areas of vital importance for the livelihoods of the communities. The community receives R\$ 160 per year per family signing the agreement.

This amounts to about 1200 R\$ (USD 400) per participating household per year since programs started. The average income in the area seems to be in the order of 5 000 USD per family, per year. The system has operated in RDS Rio Negro since 2009. In APA Rio Negro, only the Family component has been operative, introduced in 2010. Bolsa Floresta stands out as the only program that has ensured continuous, and in comparative terms, fairly high payments. An important factor here is the fact that it has been supported legally by the state, has a long term strategy and has fairly secure finances. As already mentioned, payments are not performance-based, but may be withheld if rules committed to are broken.

Both pilots in Tanzania have undertaken payments – in these cases called ‘trial payments’. This explains that payments were made more to test a system than to compensate for costs faced. TFCG/MJUMITA made payments based on ‘mimicking’ a performance-based system including estimated amounts of reduced CO₂ emissions per ha. for each type of forest valued at the

present market price for CO₂, which was quite low at the time. This system determined the total payment to each village. Regarding the rules for internal distribution at village level, the system chosen included a payment to each village inhabitant (older than 6 months) up to a maximum of five receivers per household. The villages decided on a fraction to be kept for community projects. In some villages, the latter sum was left with MJUMITA until the villagers had resolved internal governance issues. Given the rules, maximum payments per household were about 40 USD. While the system mimicked a market payment, transfers were not differentiated per household. It was argued that to pay according to opportunity costs – higher payments to e.g., charcoal producers – was against local norms. Charcoal producers were seen as ‘bad’ since they earned income by unduly exploiting a common resource. We note that a system based on equal payment to each inhabitant also substantially reduced transaction costs.

AWF put less emphasis on payments than TFCG/MJUMITA. A ‘trial payment’ was not included in their original plan for the Kondoa pilot, while AWF, as we have seen, made efforts to help communities enter the carbon market. In the end, payments were still made to community projects. An important aspect here was the distribution between communities and the state, as concluded in the JFM agreement. Benefit sharing in JFM agreements has been a hot issue in Tanzania, with no national resolution. In the case of Kondoa, an 80-20 (communities-state) rule was finally agreed. Payments were in the order of 3000 USD per village – i.e., below 5 USD per family.

The DRC and Ugandan pilots have not yet been developed to the stage where payments could be made. In Ongo, they have, however, established a system for benefit sharing. The options suggested by Ecotrust were focused



Trial payment in Kilosa Photo: TFCG

at community-based payments, with an element of individual pay. These options were combined to form benefit-sharing packages, which were presented to the communities at a general meeting. Solutions were voted on in the meeting.

We also note that the Ongo pilot has supported communities to produce seedlings. Ecotrust has bought these from a recently established community nursery. There has also been some forest management training in the villages. There has finally been some investment in the Bikoro pilot regarding e.g., agro-forestry, cultivation of low-land rice in swamp forests, the production of bricks and improved stoves to some households.

The fact that some pilots terminated at a certain date, is problematic. When they were established, there was the belief that, by their termination date, a functioning carbon market and/or a system for payment via the state would have been established. The international negotiations have not been able to conclude on any system for the long-term financing of REDD+.

The process of introducing REDD+ and establishing REDD+ governance structures



Photo: Rafal Cichawa, Shutterstock

Main findings:

- REDD+ has been introduced through open meetings where all local inhabitants could participate. There are cases where not all people were informed.
- The question of whether or not to participate has been taken by communities (African pilots) or individual (female) household heads (Brazil).
- Processes have generally been quite transparent, while information has largely come from the pilot organizers, creating power asymmetries.
- Evaluations by local inhabitants of sites of the REDD+ pilot projects vary substantially. This variation cannot be (fully) explained by the processes involved or the levels of restrictions and payments.
- The level of trust in the organizer seems important for the appreciation of the project.



We have undertaken studies in all pilots except the APA Rio Negro to establish knowledge on how people in the involved communities evaluate the process of introducing REDD+. The data were collected 3-4 years after the pilot projects had started. That implies that in RDS Rio Negro, Kilosa and Kondoa, all processes regarding the establishment of the pilot in the villages were completed. This means that the villages/villagers had decided whether to join REDD+; village land was delimited to the extent relevant, management plans were concluded and by-laws defined; and payments were undertaken. In the Ugandan case, no payments have yet been made, while some income generating activities have been introduced. In the DRC pilots, project development has been very slow, so while data collection there took place about 3 years after the start, the only process that was completed was that of deciding to join the project or not. As documented above, some income generating activities were introduced in Bikoro, while not in Gemena.



Forest scouts in Kondo, both men and women involved. Showing fruits from trees.

In the case of the Tanzanian pilots, the organizing NGOs had initial meetings with district officials and the leadership of involved villages (village councils). The decision on whether or not to join REDD+ was taken at a village general assembly, where people from the involved NGOs and district officials participated and informed about the project. This process was completed in 2010. To increase participation, TFCG/MJUMITA also organized meetings at the sub-village level before the final general assembly. At this latter meeting, members of village natural resource committees were elected. This committee would later be leading the land use planning process. Attendance levels in meetings was about 20% of the adult population. It is notable that the number of households in the villages number around 500-1000. We observed a case in Kilosa where one sub-village was not included due to long distance.

The organizers seem to have only emphasized the gains of REDD+ such as conserving forest resources, supporting

agricultural development and other livelihood enhancements, education and carbon payments. We find no mention of uncertainties regarding e.g., payments. The organizers and district officials were typically the only source of information to local communities.

In the case of Kilosa, all 13 of the villages invited endorsed REDD+ at this stage. In Kondo, the situation was different. There was significant opposition in 5 out of 21 invited villages. Two of these did not accept REDD+. The main issue was fear of 'land grabbing' and opposition among some charcoal makers. Local leaders typically played a central role in the opposition.

Land-use plans with by-laws were also decided at a village general assembly. There were some conflicts observed regarding drawing borders between villages. In Kilosa, there were also conflicts around a few resettlements that followed from the fact that nobody was allowed to live in protected forests. Opposition to the land use plans were mainly found among charcoal makers, who in some cases complained that they did not get a say/felt they could not speak freely at meetings. One village in each pilot opted out of REDD+ during land-use planning as a reaction to the limitations involved.

In Kilosa, the payment system was decided in a general assembly based on a proposal by TFCG. All villages chose a scheme with individual payments, where a part was kept for community projects. We note some disappointment with the amount of payments made. In Kondo, AWF decided to pay a common sum to each village. The use of this money was decided upon in a general assembly.

Regarding RDS Rio Negro, the introduction of Bolsa Floresta followed a standard routine developed by FAS. At the time, the program had already been introduced in several other conservation units, so FAS had gained considerable experience. While the program had been developed with inputs from civil society organizations, the structure of components was given at the

point of introduction in the RDS Rio Negro.¹ The launch of Bolsa Floresta started with introductory workshops where FAS informed about the program. All households were invited to participate and in RDS Rio Negro, most did. The workshops ended with each female household head being asked if she would sign the agreement (Family component). 96% of those interviewed in 2013 had done so. This implied a monthly payment against following rules defined in the contract (see above).

Workshops were also held regarding the other three components, including elections of members to the association. Later, yearly meetings have been held to decide on the allocation of resources to the Income and Social components. 80% of those interviewed stated that they had participated in all or some of these meetings.

Some disagreements or disappointments were registered. A main comment was that the payment was too low to cover lost income. Several responded that the loss of income from not being allowed to cut timber was substantial. It is important to note that this regulation does not come from Bolsa Floresta. Hence, there seems to be a confusion regarding what the different laws and programs imply. We note at the same time that it was first with the Bolsa Floresta program that individuals had to sign an agreement where they declared abidance to the RDS rules. We also note that by developing management plans, timber harvests could continue, albeit with less timber cut. The price would, however, be higher as logging was now legal. While Bolsa Floresta seems to have represented little loss in income and fairly high compensations, it may seem as if expectations were higher than in e.g., the Tanzanian pilots. We also note that not all inhabitants felt free to decide whether they should join the program or not. Some said they felt pressured by their village leader. While we have not established the basis for this claim, we note that the more people that enroll in the

program, the more resources from the other components would flow to the village. While these common resources were decided upon in open meetings, we also observed some inhabitants complaining that decisions were taken by leaders outside of the meetings.

Turning to Ongo, forest management initiatives started already in 2000, when the Budongo Forests Community Development Organisation mobilised forest-neighbouring communities to participate in the use and management of forest resources. The communities were supported to form and register a community-based organisation – the CLA. In 2007, Ecotrust introduced the Trees for Global Benefit (TGB) activities in the area. The processes included community capacity building, farmer recruitment and monitoring. Several community sensitization and awareness meetings were conducted. TGB projects restrict farmer enrolment to a land size of at least 0,4 ha. Given that most of the farmers had small land holdings, only 42 individuals were enrolled. In 2012, Ecotrust sought a means of involving more community members in tree planting as well as forest management by opening up membership for all living in the villages. This was complementary to the TGB activities. While this implied improved forest management, the design was similar to what was expected of sub-national REDD+ pilot projects in Uganda.

Through several sensitization and awareness sessions, Ecotrust and the other partners continued to engage the communities regarding community forest management and the potential to benefit from the ecosystem service markets. In terms of participation, about 30-50 people attended the village meetings, while the general meetings, often held once or twice a year, had an attendance of 120-200 people. There was resistance from some of the members especially from Kibali village. This posed a challenge during the boundary opening survey process, causing land conflicts. These were, however, finally resolved through consultative meetings at the village level involving also district officials.

¹ That does not imply that there have been no changes. Originally, the Income and Social components were one. Since 2011, representatives from each conservation unit are involved in rule developments.

The DRC pilots also included meetings where REDD+ was introduced and where development challenges and future orientation of project activities in the communities were discussed. As far as we understand, there was no voting on joining REDD+. Meetings were also held to establish the village REDD+ organization (see above). Finally, there were meetings held in Bikoro to select members for the team to identify village forest boundaries as well as meetings regarding the implementation of project demonstration activities. We observe some complaints in the villages from people that had not been informed about the meetings.

In five of the pilots, people interviewed were asked about how well they appreciated the program introduced. In Brazil, we chose to focus on the RDS Rio Negro, as the program was not completely introduced in the APA. Similarly, in Gemena the project was not developed far enough to make such a question relevant. Table 1 shows the distribution for each pilot.

It may seem somewhat confusing that inhabitants in Kilosa, Kondoa and Ongo have an overall opinion about the REDD+ pilots that seems better than those living in RDS Rio Negro. Seen from the outside, Bolsa Floresta brings many more resources to the villages and engages all those that wish for a variety of development activities. At the same time, restrictions on forest use seem weaker. This is the conclusion even if we correct for the fact that incomes are generally higher in the Brazilian pilot compared to the Tanzanian and Ugandan pilots. We have already mentioned that the inhabitants in RDS Rio Negro seemed

to link restrictions in timber harvesting to Bolsa Floresta and not the rules of the RDS. Furthermore, it seems that expectations have been higher in the Brazilian pilot. One may also wonder about the effect of the forest status. In the Tanzanian, but also Ugandan pilots, deforestation has been high and it has been a local issue for some time to protect forests. In central Amazonas, present deforestation rates are low. While FAS supports the communities to 'bolster' against future deforestation, the people in the area may see less of a need for that part of the program.

The difference between the pilots in Tanzania is worth noting. The selection of villages for the study in Kondoa was not completely random. We randomly chose four villages that said yes to REDD+ and that completed the program. We added three villages of which one decided not to engage, one opted out in the stage of land use planning and one that was not paid as the village did not comply with the rules agreed. The average for the first four villages was at the level of Kilosa – actually slightly higher – while the three others had an average of 2,9. An analysis of the whole sample in Kondoa showed, however, that it was not which village one belonged to, but the trust in the responsible NGO that explained the variation in opinion. REDD+ would appear as quite an uncertain 'business' for the villagers in a condition like that of Tanzania. It is then reasonable to conclude that the perception of the responsible NGO becomes very important.

We also observed a severe conflict in the Uganda pilot. However, those benefiting most from the original situation by expanding agriculture into the forest were few. There has

Table 1. Respondents, overall opinion of the pilot: average score and in percent

Pilot	Average	Very bad	Bad	Indifferent	Good	Very good
Kilosa (N=125)	4,1	1	2	4	71	22
Kondoa (N=195)	3,7	6	12	13	47	22
RDS Rio Negro (N=100)	3,3	5	10	42	36	7
Ongo (N=100)	4,2	2	3	11	40	44
Bikoro (N=75)	2,2	36	32	9	20	3



Settlement in Rio Negro

been an ongoing process for many years to establish a community forest and there seems to be an understanding among the majority that protecting the forest is important for their future livelihoods. Observing climate change, particularly less rain, is also part of this change in perceptions. We note, however, that several of those interviewed did not know that the association (CLA) had become open to all living in the four villages bordering the forest.

In the case of the DRC pilot in Bikoro, responses seem to reflect that the pilot developments are very slow. We also observe some discontent with development projects as some claim that they did not follow what was agreed in meetings. Further investigation revealed that some of these incidents were due to poor implementation by contracted service providers.

Regarding the above, it should be emphasized that it is demanding for people in the pilot areas to understand what REDD+ is. This regards both the aims and the impacts. There are also many uncertainties involved. The organizers have a lot of power, being responsible for creating the overall strategies

and managing information flows. While there is some variation, the general impression is that organizers have put substantial efforts into reaching out to the inhabitants. The processes have mostly been open and we have found no examples of elite capture. Village people dominantly express that they were able to voice concerns and that the information received was good. Some people emphasize, however, that they felt they could not speak freely, typically referring to power issues. We note that REDD+ was politically supported from above. This may have made opposition more demanding to organize. Furthermore, we observe that almost all information to villagers came through the NGOs and their partners. Their emphasis has predominantly been on gains. The uncertainties regarding the future of carbon markets have in most cases not been well communicated to villagers. We note that the organizers depended on pilots being a 'success' as judged by those financing the project. That may have influenced the content of information flows. At the same time, there seems to have been a strong drive to try to satisfy local communities.



The costs of establishing and using REDD+ governance structures

Main findings:

- Transaction costs for REDD+ are significant, in these cases clearly above present carbon prices.
- Costs seem to depend on the format of the pilot – which components are included – and to what extent REDD+ can build on already existing institutions and organizations.

Establishing REDD+ is largely about creating new governance structures, including changes in existing structures of institutions and actors. The costs of establishing, maintaining, changing and using governance structures is often termed transaction costs. In our projects, there is no maintenance of institutions yet, while we have not distinguished between establishing new, and



Forest along the river Rio Negro

changing old governance structures. Hence, we distinguish only between costs for establishment and use – the latter termed ‘running costs’.

We have gathered information about these costs in the three pilots that have been completely established – i.e., the RDS Rio Negro and the Tanzanian pilots – from the start of the projects through 2012 where they were largely completed and payments were made even in the Tanzanian cases. Costs cover those accruing to the organizing NGO, services bought from outside plus the time used by local inhabitants to participate in meetings and in undertaking land use planning, etc. Costs regarding establishment of governance structures – establishment costs – include general planning, development of information programs, decision-making, establishment of new institutions and actors plus a general overhead. Running costs include training activities, continuous decision-making, and transacting over payments. The aim has been to also include data on monitoring. We still lack some information and these costs are not included below.

Table 2. Costs of establishing and using REDD governance structures in the period 2009-2012 for the RDS Rio Negro, Kilosa and Kondoa pilots, in 1000 USD and percent.

	RDS Rio Negro		Kilosa Kondoa		Kondoa
	USD	%	USD	%	USD
Establishment costs	985	33	2 344	89	1 643
Running costs	1 996	67	296	11	
Total costs	2 981	100	2 640	100	1 643

Table 2 offers an overview of the main cost categories of the three pilots. In the case of Kondoa, it has not been possible to distinguish between establishment and running costs. The situation is, however, quite similar to Kilosa.

The total level of costs is not very different, while we observe that the Kondoa pilot is somewhat cheaper. As the three pilots deliver different outcomes in the form of institutional change and local activities, it is hard to compare just by looking at these figures. In the case of RDS Rio Negro and Kilosa, it has been possible to go one step further as prognoses exist in project documents about the expected reductions in CO₂ emissions the next 30-40 years. While there are great uncertainties here – regarding both the business-as-usual scenarios and how successful the projects are – it offers some basis for comparison. Table 3 offers the results using a model called ‘flow summation’ and a 5% discount rate. Changing the discount rate has substantial influence on the calculated running costs. Using a 7% discount rate reduces these costs to about half, Using 2% triples the costs.

Combining the information in the above

tables, we note that transaction costs are significant, while remembering that the carbon price in 2013 was around 4 USD/tCO₂e and at present the level is about 5. At the same time we observe that the structure of costs vary substantially. The costs of establishment in the Brazilian pilot comes out as much lower while running costs are much higher compared to that of Kilosa. This has very much to do with the type of intervention. The Bolsa Floresta was developed very much into a ready-made program to introduce. FAS did not need to engage in establishing property rights. The production of management plans was also less demanding as it was an already established system. Costs of running are, however, relatively high. The program has much emphasis on sustainable development and substantial resources are included in the continuous management of the various components. Making payments is actually cheap as a system with debit cards is used. It is the running of the three other components that seems most demanding. Whether all of them are necessary for reducing carbon emissions is an issue for discussion, while FAS emphasizes the importance of development for long-term

Table 3. Costs per estimated reduced ton of CO₂e in a 40 years perspective for the RDS Rio Negro and Kilosa pilots, 5 percent discount rate.

	RDS Rio Negro	Kilosa
Establishment costs in USD/tCO ₂ e	0,6	2,1
Running costs in USD/tCO ₂ e	2,2	1,0



Deforestation in village forest, Kondoa

emission reductions.

Turning to Kilosa, the costs are mainly related to establishment. TFCG/MJUMITA had largely to start from 'scratch'. Establishing property rights, conducting land use planning, developing the system for carbon trading – while not completed by the end of 2012 – were all quite demanding. On the other hand, there were rather few training activities compared to those undertaken in the RDS Rio Negro pilot, and there was only one payment made. We repeat that monitoring costs are not included in any of the cases.

The Kondoa pilot is somewhat cheaper to establish than the one in Kilosa, while the number of villages and inhabitants are both

about 50% larger. One reason for this may be that villages in Kondoa already had land certificates by the start of the pilot period. Moreover, much of the forest was in two government forest reserves. The rules for these had to be the same for all villages. This may have implied a simplification, while the villages on the other hand had to develop a common organization for all villages bordering state forests.



The impacts of REDD+

To establish knowledge on the impacts of REDD+ initiatives on deforestation rates and livelihoods, we have undertaken analyses using the ‘before-after-control-impact’ (BACI) approach. Whilst changes can be observed after an intervention is made, it is hard to say whether these changes are an effect of that intervention or some other factor. The BACI design is developed to help control for other potential influences. Field data were collected from both treatment and control units before and after the intervention, which in this case was the introduction of REDD+. Following the BACI methodology, we compare the differences between treatment and control sites, before and after the intervention, to try to isolate any impacts of REDD+ on deforestation trends.

It was possible to conduct such analyses in both the Brazilian and Tanzanian pilots. Analyses regarding deforestation rates are performed for all four pilots. In the case of livelihoods, we have collected baseline data only for one of the areas in Brazil, the APA Rio Negro. We emphasize that changing deforestation and livelihoods are slow processes. In this context, 5 years is a short study period. Furthermore, there is much uncertainty involved, and results should be interpreted with caution.

Effects on deforestation and forest degradation

Main findings:

- REDD+ appears not to have significantly changed deforestation rates in the period analyzed. There may be a positive effect in one of the four pilots.
- Forest cover changed much more in Tanzanian than Brazilian pilots. Uncertainties are, however, also greater in Tanzania, as forest degradation is more significant.
- Droughts have influenced forest degradation and deforestation levels.

In tropical forests, the above-ground living biomass of trees typically constitutes the largest pool of carbon and is the part of the forest most directly impacted by deforestation and forest degradation. Therefore, quantifying forest cover and ecosystem carbon stocks is vital for understanding the relationship between changes in land use and cover and carbon emissions. We estimated the amounts of forest cover gained/lost in the Tanzania and Brazil pilot areas using GIS data, Landsat imagery, and field observations. The land cover was captured on the basis of Landsat 5 TM and Landsat 7 ETM. We have analyzed data for three 5-year periods from 2000-2015.

There are uncertainties particularly regarding the effect of REDD+ on forest degradation. Such degradation is an important factor in Tanzania, and even using high-resolution images for validation, made it demanding to capture this process effectively. In the following presentations, we only refer to changes in the overall forest cover. Our analyses are based on differentiating between forest cover above and below 50%. More time is required to perform further spatial analyses using high-resolution imagery to generate more indepth insights.

Land Use and Land Cover Changes in Kilosa

The analyses covered 8 out of 12 pilot villages and 9 control villages adjoining the Kilosa pilot areas. The total area of pilot and control villages included is about 60 000 ha for each. Around 40-50% of the areas are in forests (see Appendix). Forest cover, mainly woodlands,

has changed substantially over the period 2000-2015 in the pilot villages. The area reduced from around 28 500 ha in 2000 to around 23 500 ha in 2006. It was then rather stable until 2010 before it regained its 2000 level (29 000 ha) in 2015 (see Figure 1). The reduction in 2000-2006 was due to increase both in shrub- and cropland, the two other categories of land included in the analyses. Similarly, both area types decreased between 2010 and 2015.

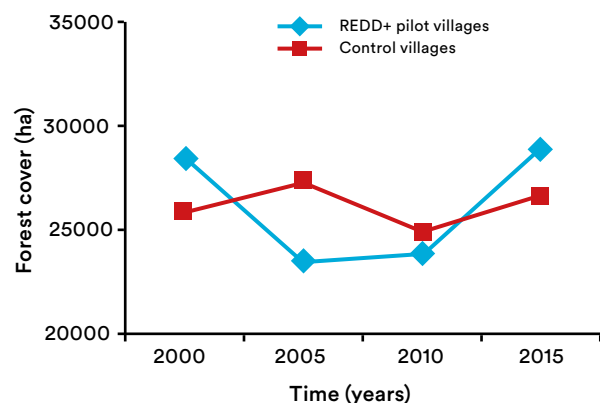


Figure 1. Development in forest cover (ha) in Kilosa: Pilot and control villages

Considering the controls, the forest area increased from around 25 800 ha to 27 300 ha between 2000 and 2006. It then reduced to slightly below 25 000 ha in 2010, and increased again in 2015 to 26 600 ha. Shrubland has decreased over time, while cropland has increased.

The results seem to indicate an effect of REDD+. In the pilot area, we observe changes from a decrease in forest cover, through a

stabilization phase, to a phase with increase. The control shows a more stable situation, with a fluctuation around 25 000 ha. Regarding the potential effect of REDD+, we note that there may be a trend shift in the pilot area already occurring before 2010, and there is also an increase, albeit much weaker, in the control area after 2010. This gives rise to some uncertainty on whether there is an effect of REDD+ in Kilosa.

Land Use and Land Cover in Kondoa

The analyses cover all 18 pilot villages and 12 control villages bordering the pilot areas. The total areas of the pilot and control villages were around 60 000 and 50 000 ha respectively. Forests cover around 50% of the land in both areas (see Appendix). In year 2000, woodland covered around 30 000 ha in the Kondoa REDD+ pilot villages. According to these analyses, woodland decreased to less than 25 000 ha between 2000 and 2006, and increased to around 31 400 ha in 2010. In the last 5 years, forest cover has been rather stable with a slight increase of 250 ha according to the analyses (see Figure 2). Shrubland increased substantially in the first 6 years, and reduced by more than 50% in the next period, explaining the recovery of forests and an increase in cropland. We note that from 2010, shrubland increased again, while cropland decreased, keeping woodland fairly stable.

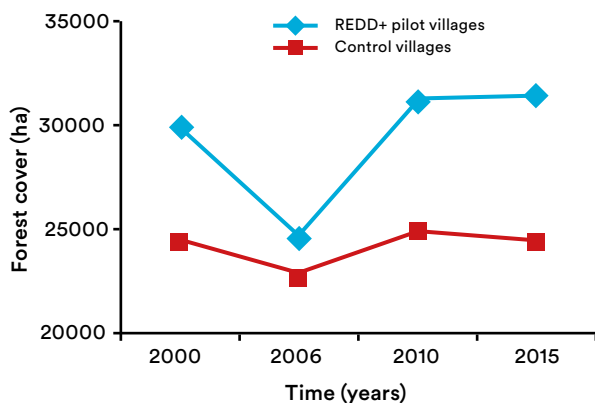


Figure 2. Development in forest cover (ha) in Kondoa: Pilot and control villages

Developments in the control villages in Kondoa follow much the same pattern as those observed in the pilot area, while magnitudes

are generally smaller: a decrease in the first period is followed by an increase until 2010. Thereafter, there is a slight decrease until 2015. Changes in shrubland are less distinct, while cropland appears to increase throughout the whole period.

While we observe that there has been a small increase in woodland after 2010 in the pilot area and a similar reduction in the control area, we cannot ascribe this difference to REDD+ initiatives. A large and positive change in both areas came in the years before REDD+ was introduced.

Land Use and Land Cover in the Brazilian pilots

The pilot areas in Brazil both lie along the Rio Negro river. As explained earlier, the Bolsa Floresta program was fully established in the RDS, while in the APA, only the Family component was introduced. We have used the same control area for both the APA and the RDS Rio Negro, i.e., the RDS Puranga Conquista. RDS Puranga lies close to the pilot areas and borders the Rio Negro river.

The RDS Rio Negro is around 103 000 ha, the APA Rio Negro is 560 000 ha and RDS Puranga Conquista is 86 000 ha. The forest cover in RDS Rio Negro is around 86%. In the APA, it is at the level of 96%, while the percentage in the RDS Puranga lies in between these two, around 90%.

The analyses in the Amazon areas have been challenging in the sense that we have not been able to avoid cloud cover (mainly in 2005 and 2009, see Appendix: Tables 5-7), a factor that influences the results. While the areas covered by clouds are small, the way they are treated influences the estimated changes in forest cover to a large degree. This is so as changes in forest cover are also small. In the following assessment, we have assumed that the land under the clouds has a distribution equal to that of the land that is visible from the images. The land categories used are 'forests' (primary), 'fallow' (secondary forest), 'bare ground' (non-forested land), 'water' and 'clouds'. Agricultural activities are found in both 'fallow' and 'bare ground'. Settlements are all in the latter category.

Given our treatment of clouds, we found that the forest cover has been rather stable in all areas. In the APA Rio Negro it is estimated to be around 538 500 ha in 1999. It reduced to around 537 800 ha in 2005 and further to 537 200 ha in 2010. The forest cover for 2015 was 537 000 ha. The area of fallow reduced in the last period, while the area defined as ‘bare ground’ increased. The main explanation for the latter seems to be a severe drought in 2014 making some ground visible, which is otherwise almost always flooded.

In the RDS Rio Negro, forest cover reduced by around 500 ha in each period from 1999 until 2010. In the last period, it is reduced more, at around 1500 ha. We observe a similar pattern with fallows and bare ground as in the APA. The loss in forest cover over the last 5 years is partly explained by agriculture, logging and real estate developments. A new bridge was inaugurated in 2011, making parts of the RDS Rio Negro accessible for people wishing to build recreational cabins.

Considering the control area, the RDS Puranga,

the forest area was almost unchanged. It reduced from 78 400 ha in 1999 to 78 100 ha in 2015. In this area, bare ground has increased, though less than in the two pilots. Figure 3 gives an overview of the developments in forest cover.

Emphasizing the uncertainties with clouds and implications of the 2014 drought, we conclude that there seems to be no less deforestation in REDD+ pilots than in the control area. There are two important caveats to this conclusion. First, in the APA Rio Negro the Bolsa Floresta program was not fully implemented – i.e., only the Family component was established. Second, in the RDS Rio Negro, a large fraction of the deforestation seems to be caused by real estate developments and illegal logging and not in the villages where Bolsa Floresta operates. Further research is needed to clarify this. We note that there appears to be increased awareness among communities that primary forests should not be cut for agricultural expansion. This may have implications for forest cover in the longer term.

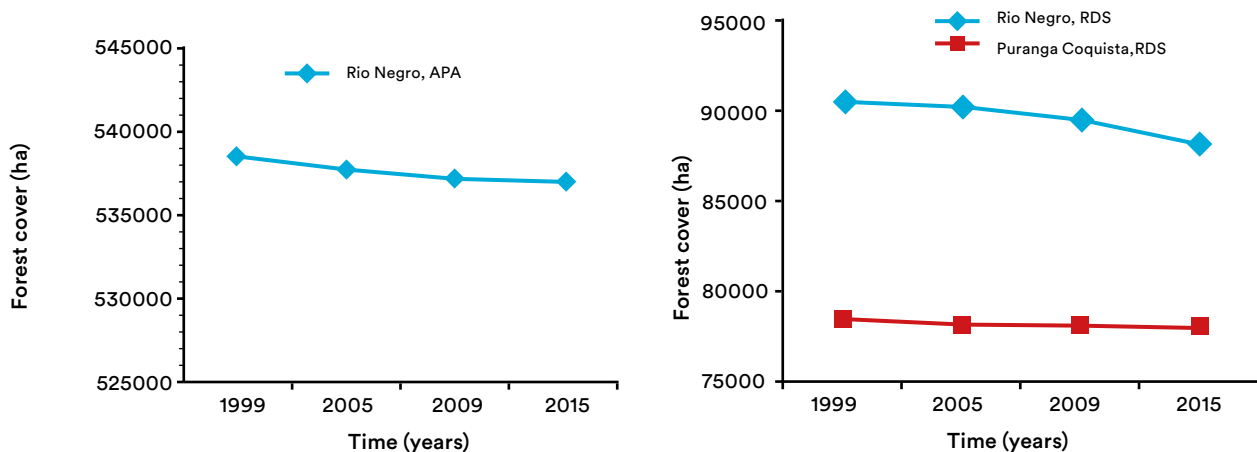


Figure 3. Development in forest cover (ha) in the Amazon areas: Pilots (APA Rio Negro to the left; RDS Rio Negro to the right) and control (RDS Puranga to the right)

Effects on livelihoods and income

Main findings:

- There were severe income reductions in the Tanzanian pilots between 2010 and 2015. These were caused mainly by a drought.
- Incomes were also reduced in the APA Rio Negro, mainly due to reductions in government transfers.
- REDD+ seems not to have had a significant effect on the level of income, in the pilots studied, at least in the short run.

Analyses of the developments in income were undertaken in the two Tanzanian pilots and in the APA Rio Negro in Brazil. We have evaluated livelihood changes both quantitatively as well as qualitatively by assessing the opinions and experiences of people. Quantitative livelihood changes are based on calculations of both cash and subsistence income from all livelihood strategies pursued, including crops, forest products, livestock, fish, off-farm businesses and remittances for the 12 months before the time of data collection. Livelihood data were collected from both pilots and control villages in 2010, just prior to the implementation of REDD+, and again between November 2015 and May 2016, after REDD+ had been operating for 5-6 years. Table 4 presents the changes in total income and forest income in pilots and control villages for the periods studied.

We observe that total income fell between 2010 and 2015 in both control and pilot communities. In Tanzania, the reduction was more drastic in Kondoa than in Kilosa because of a severe drought that hit Kondoa in 2014/15. Kilosa also experienced drought, but it was less severe than in Kondoa. In APA Rio Negro, total income decreased mainly due to reductions in government transfers. Forest income fell in the pilot and control areas in Kondoa while it remained stable in the controls and increased in the pilot villages in Kilosa.

To establish if REDD+ affected income, we ran multivariate regressions using fixed effects or random effects models. The dependent variable is the log of income, therefore the coefficients are interpreted as the percentage change (coefficient*100) in income arising from a unit change in the independent variable. In the analyses, we have controlled for age, gender,

Table 4. Annual income in pilot and control villages in 2010 and 2015 (USD)

	2010			2015*	
	Pilots	Controls		Pilots	Controls
Kilosa (N=141)			Kilosa (N=146)		
Total income	822	884	Total income	675	621
Forest income	83	114	Forest income	150	114
Kondoa (N=153)			Kondoa (N=148)		
Total income	1 329	1 644	Total income	641	618
Forest income	167	154	Forest income	97	72
APA Rio Negro (N=116)			APA Rio Negro (N=116)		
Total income	5 487	8 497	Total income	4 127	4 878

*Data in APA Rio Negro are from 2016

Table 5. Income changes in Kilosa

	Total income (233 obs.)		Forest income (218 obs.)	
	Coefficient	St. error	Coefficient	St. error
REDD+ impact	-0,029	0,276	1,23***	0,381
Year dummy (2015=1)	0,052	0,219	0,659**	0,292

Table 6. Income changes in Kondoa

	Total income (232 obs.)		Forest income (176 obs.)	
	Coefficient	St. error	Coefficient	St. error
REDD+ impact	0,134	0,267	0,146	0,452
Year dummy (2015=1)	-0,990***	0,34	0,434	0,64

Table 7. Income changes in the APA Rio Negro

	Total income (151 obs.)	
	Coefficient	St. error
REDD+ impact	0,177	1,093
Year dummy (2015=1)	-0,829	1,134

education, size of the household, farm size, income shocks, social capital, asset ownership, the value of tropical livestock units and the amount of forest area deforested in the last 12 months. In estimating any effects of REDD+, we have also controlled for market access, village level inequality, location (village), and placement in a pilot or control village. Results regarding the impacts of REDD+ and a time trend (year dummy) are found in Tables 5, 6 and 7 (where ** denotes a 5% significance level and *** denotes a 1% significance level).

REDD+ seems to neither harm nor improve rural livelihoods. This is the case for all three study areas. In Kilosa, there is a negative effect of REDD+ on total income of about 3%, but this impact is not statistically different from zero. In Kondoa, REDD+ has positive effect of about 13%, but again the effect is not statistically significant. The large income loss experienced in Kondoa, in both the pilot and the control areas, may be as expected due to the drought (as captured by the year dummy). The effect of REDD+ on total income in APA

Rio Negro is positive, but again, this effect is not statistically significant.

The structure of REDD+ implementation may explain the findings. In the APA, the full BFP program was not implemented, as payments were limited to the Family component. In Tanzania, the strategy of the NGOs in both study areas prioritized strengthening institutions and forest governance and focused less on rural development. As such, investment in income generating activities was weak and not widespread among residents. Payments for reduced deforestation were not sustained, as trial payments were made only once. Accordingly, this lack of emphasis on compensation implied that payments and livelihood efforts could not translate into significant changes in incomes in any of the three areas.

It is, however, interesting to observe that in Kilosa, REDD+ seems to have had a positive and highly significant effect on forest income, as it is only here that we have concluded that

REDD+ may have reduced deforestation. People depend on many livelihood strategies and there is certainly flexibility, at least in the shorter term, to shift away from protected forests to other parts of the landscape. The result could therefore be a (short-term) reaction to the drought experienced here, which may have forced people to resort to more forest use as a coping strategy in 2014-15. Hence, forest recovery might have been even higher if the drought had not hit. One should also note that, to the extent REDD+ has resulted in limiting the access of external users, more resources have been available for residents in REDD+ villages. We also note the possible effects of introducing sustainable charcoal-making activities that began in the last year of project implementation. In Kondoa, REDD+ appears to increase forest income, though this change is not statistically significant. The difference in impact between Kilosa and Kondoa may be due to the different tenure systems in the two pilots.

In Kilosa, REDD+ operated in community owned forests while in Kondoa government forests dominates. The REDD+ rules were therefore stricter in Kondoa since communities could, for example, not set aside forest areas to be used for their own purposes.

Closing remark

Our findings are influenced by the fact that REDD+ has been operating for just a few years. Changes in forest use seem to demand rather profound shifts in the way people make their living. This requires sustained efforts, and success is not guaranteed. The fact that REDD+ has no sustainable financial basis for the years to come could imply that investments in institutional changes, made to facilitate a shift in deforestation trends, could be wasted. In our case, only the Brazilian pilots have a secured financial basis for the future. At the same time, we note that the clarification of property rights undertaken strengthens the position of the communities involved.



Women meeting under a tree, Ongo

Appendix

Table 1: Land use and land cover changes between 2000 and 2015 in Kilosa REDD+ pilot villages. Tanzania

Year	2000		2006		2010		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Woodland	28 471	48	23 417	39	23 859	40	28 905	49
Cropland	20 857	35	22 505	38	23 058	39	20 966	35
Shrubland	10 181	17	13 586	23	12 592	21	9 638	16
Total	59 508	100	59 508	100	59 508	100	59 508	100

Table 2: Land use and land cover changes between 2000 and 2015 in Kilosa Control villages. Tanzania

Year	2000		2006		2010		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Woodland	25 819	42	27 306	44	24 878	40	26 591	43
Shrubland	16 009	26	10 474	17	13 129	21	11 513	19
Cropland	20 221	33	24 269	39	24 042	39	23 945	39
Total	62 049	100	62 049	100	62 049	100	62 049	100

Table 3: Land use and land cover changes between 2000 and 2015 in Kondoa REDD+ pilot villages. Tanzania

Year	2000		2006		2010		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Woodland	30 070	48	24 742	40	31 392	50	31 654	51
Shrubland	12 943	21	17 917	29	7 652	12	10 103	16
Cropland	19 415	31	19 769	32	23 384	37	20 671	33
Total	62 428	100	62 428	100	62 428	100	62 428	100

Table 4: Land use and land cover changes between 2000 and 2015 in Kondoa control villages. Tanzania

Year	2000		2006		2010		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Woodland	24 533	49	22 733	45	25 036	50	24 530	49
Shrubland	8 599	17	10 640	21	7 013	14	7 420	15
Cropland	16 982	34	16 740	33	18 064	36	18 163	36
Total	50 113	100	50 113	100	50 113	100	50 113	100

Table 5: Land use and land cover changes between 1999 and 2015 in Rio Negro RDS. Brazil

Year	1999		2005		2009		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Forest	90 316	88	90 216	88	88 405	86	88 086	85
Fallow	5 797	6	6 160	6	5 966	6	5 209	5
Water	6 049	6	6 049	6	6 049	6	6 049	6
Bare ground	582	1	628	1	1 291	1	3 716	4
Cloud/shadow	315	0	6	0	1 349	1	0	0
Total	103 059	100	103 059	100	103 059	100	103 059	100

Table 6: Land use and land cover changes between 1999 and 2015 in Rio Negro APA. Brazil

Year	1999		2005		2009		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Forest	538 136	96	532 721	95	534 343	95	536 946	96
Fallow	10 777	2	11 331	2	10 442	2	6 852	1
Water	9 500	2	9 500	2	9 500	2	9 500	2
Bare ground	905	0	907	0	2 500	0	6 394	1
Cloud/shadow	435	0	5 293	1	2 968	1	61	0
Total	559 753	100	559 753	100	559 753	100	559 753	100

Table 7: Land use and land cover changes between 1999 and 2015 in Puranga Conquista RDS. Brazil

Year	1999		2005		2009		2015	
Land cover type	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover	Area (ha)	% cover
Forest	77 940	90	77 763	90	76 989	89	78 053	90
Fallow	3 366	4	3 574	4	3 427	4	2 501	3
Water	4 439	5	4 439	5	4 439	5	4 439	5
Bare ground	125	0	169	0	313	0	1 348	2
Cloud/shadow	478	1	403	0	1 180	1	7	0
Total	86 348	100	86 348	100	86 348	100	86 348	100

Notes:



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