

November 2015

Testing REDD+ in the Beira Corridor

Who drives land use and land-use change,
and why?

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About the project

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Published by IIED, November 2015

<http://pubs.iied.org/13582IIED>

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Contents

Summary	2
Introduction	2
IIED's work in the Beira Corridor	3
Key findings and proposed solutions	3
Rich but poor	4
What drives deforestation and forest degradation?	6
The household's perspective	6
So what does this imply for REDD+?	12
Conclusion	14
These solutions are not new ideas, so what is needed to leverage transformative change?	14
Bibliography	15

Summary

The Testing REDD+ socioeconomic baseline study of the Beira landscape corridor confirmed the drivers of deforestation and forest degradation as unsustainable agriculture practices, including shifting cultivation and fire used to clear land, to hunt and to collect honey. The role of hunting and honey collection shows how harvesting non timber forest products (often referred to as NTFPs) can degrade forests — because of the use of fire. Harvesting firewood to supply biomass energy (wood is burnt in rural households, charcoal is made for urban markets) and harvesting timber for domestic and international markets is another cause of forest loss. But the most important concept to keep in mind is that these drivers do not occur in isolation. Rather, they are often sequential. This means that to address deforestation and forest degradation effectively, it is important to implement interventions concomitantly within the landscape. The Testing REDD+ project works with sustainable biomass energy production and consumption in Sofala, with sustainable value chains of non-timber forest products in Manica, and on conservation agriculture and forest concessions in Zambezia. This split is driven by limited financial resources and the initial aim of providing demonstration projects, but an integrated approach and larger scale interventions are needed to effectively reduce emissions from deforestation and forest degradation in these three provinces. In going forward, the initiative will focus on mobilizing resources for this end.

Introduction

REDD+ (Reducing Emissions from Deforestation and Forest Degradation) has been evolving. Internationally, the Warsaw REDD+ framework now guides implementation of REDD+. In parallel, individual tropical countries have progressed from readiness plans to developing strategies and testing REDD+ on the ground. Mozambique had its REDD+ readiness plan approved in 2012 and recently had an emission reducing programme, the **Zambezia Landscapes Management Program**, approved by the Carbon Fund of the Forest Carbon Partnership Facility (FCPF). This paves the way for the fund to pay Mozambique for demonstrating REDD+ results. But securing sufficient finances for interventions that will reduce emissions is critical. The recent approval of a FIP (Forest Investment Programme) for Mozambique including \$24 million to be managed by government and \$5 million by civil society organisations is important, but more funds need to be mobilised, including from domestic sources.

IIED's work in the Beira Corridor

Since 2012, IIED has been leading the 'Testing REDD+' project in Mozambique's Beira Corridor, across the provinces of Sofala, Manica and Zambezia. The project has involved both research and delivering REDD+ 'on the ground' through local partners. This document discusses how smallholder activities are driving deforestation in the Beira Corridor and proposes solutions. It provides a socioeconomic baseline against which to measure progress. However, although the discussion here is on smallholders, and our work confirms their significant cumulative contribution to deforestation and forest degradation, it is important to remember that investments in large scale land use changes, in this landscape and elsewhere, are also very important causes of deforestation.

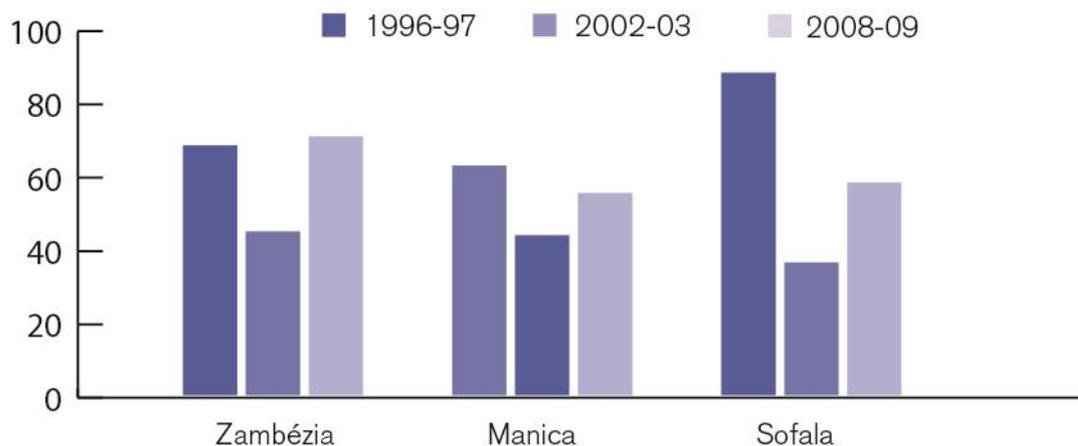
Key findings and proposed solutions

- Household members are key stakeholders and should be recognised as such in REDD+ delivery models. Our socioeconomic baseline study confirms the main drivers of deforestation and forest degradation among smallholders as: land clearance for agriculture; fire used to open new land and when harvesting non-timber forest products (such as when collecting honey and hunting); wood collected for biomass energy (firewood and the charcoal trade); and logging. These last two drivers may not involve many households but people pursuing these activities often take them as full time employment and these activities can also lead to other sequential deforestation.
- Agriculture must become more sustainable and productive — and particularly needs more investment in government run extension services to do so. Private sector and NGOs extension services have been playing an important role, but their coverage is equally limited. At present, household incomes are so low that smallholders are unable to invest in more productive agriculture and instead favour shifting cultivation. Conservation agriculture and agroforestry offer routes to better yields and improved soil fertility.
- Sustainable production and forest management must be incentivised. Law enforcement needs to act alongside devolved responsibility that gives local people a long term stake in forest management. Harvesting sustainably and processing non-timber forest products before sale are ways to add value, and so incentivise good management.
- Both demand and supply measures are needed to address unsustainable production and consumption of biomass energy (especially charcoal). Despite an apparent focus on subsistence biomass energy, the scale of commercial trade is significant: enough to supply urban centres' demand for charcoal. Forest management should be improved, tree planting should be promoted and efficiency in both producing and using biomass energy should be sought.
- Exports of timber to Asian markets have also been growing (but household members are generally employees in the logging industry and not the business owners). Sustainable logging can be promoted through various routes including forming or strengthening existing small and medium sized enterprises (SMEs), educating them on options for adding value to forest products, and by providing fiscal and financial incentives for enterprises to invest in such endeavours.
- Long term finance is key to sustained transformative change of land use practices so as to reduce deforestation and forest degradation. Donors and governments need to put adequate resources towards long-term finance commitments so that REDD+ country governments can be assured that there is a long-term demand for carbon credits generated by REDD+ interventions and rewards for the investments made.
- Performance based payments under REDD+ and other mechanisms can offer an important reward for beneficial land use changes. It is crucial that payments get to those making strides towards sustainable forest management.
- REDD+ interventions must be large enough to demonstrate differences between sustainable use and 'business as usual'.

Rich but poor

Our project selected the provinces of Manica, Sofala and Zambezia for testing REDD+ within Mozambique. These provinces, in the central region of the country, have little more than 1.5 million households (and around seven million people) and significant natural resources in the form of agricultural potential, water, forests, mining and fisheries (inland and coastal). So the region should be able to provide its population with acceptable living standards. But, paradoxically, statistics paint a gloomy picture of an actual and significant increase in poverty in recent years.

Figure 1. Poverty levels in Zambézia, Manica and Sofala as reported by PARP, 2011–14. See Government of Mozambique (2011) in the bibliography.



This contrast of richness in resources but poor in livelihoods, combined with a high dependence on natural resources (particularly forests), was the reason for choosing this region. The initial aim was to understand the extent of forest dependence and how this contributes to deforestation and forest degradation. The ultimate goal was to help identify key indicators (see Box 1) for assessing how well REDD+ interventions address the underlying causes of deforestation and forest degradation.

Box 1. Potential indicators of measuring the success of REDD+ interventions

Indicators might include:

- Frequency of fires and area burnt reduces
- Land is cultivated for longer
- Yields rise as a result of conservation agriculture
- Yields rise as a result of agroforestry
- Soil fertility improves
- Areas with improved agriculture store more carbon in the soil
- Agroforestry systems are storing more carbon (in the soil and above ground biomass) than shifting cultivation areas
- Wood is converted to charcoal more efficiently, resulting in more carbon being kept in standing trees
- The number of short term logging operators who transform to taking on long term forest concessions rises
- Wood processing within Mozambique increases (so added value is captured by the country)
- Employment rises and tax revenues (from exported timber, from VAT on domestic consumed products, and from income) increase.

Several land uses contribute to deforestation and forest degradation, including private sector economic activities such as logging and biomass energy production. However, there is a general assumption that rural smallholders contribute significantly to forest losses. To test this, we undertook a survey of 1196 households to gather information on land use practices and the motivations behind them. The number of households sampled was 399 in Manica, 398 in Sofala and 400 in a Zambézia. The sample was drawn from 16 districts (40 per cent of the region's total number of districts). These were selected based on criteria including resource availability, land uses and management regimes, and population. The sample distribution ensured a similar proportion of the population in each province, and more householders were sampled in areas with larger populations. The key survey results were then shared with 'key informants' (from government, community leaders, private sector, NGOs, totalling 30 in Manica, 26 in Zambezia and 15 in Sofala). Semi-structured interviews gathered these people's experience and knowledge, let us cross check whether our survey results indeed reflect the situation as they know it, and gave more detailed insights – for example identifying areas subject to more fires than others. We also held 36 focus groups discussions involving 285 people in total — 104 people in 14 groups in Manica, 30 people in 4 groups in Sofala and 151 people in 18 groups in Zambézia.

What drives deforestation and forest degradation?

The household's perspective

Households in the Beira Corridor engage in several activities that drive deforestation and forest degradation. These are agriculture, fire used to clear land for agriculture, collecting and producing biomass energy, logging, and harvesting non-timber forest products (including producing traditional beehives using tree bark, which kills the trees, and also using fire for hunting). The figures below tell the story graphically.

Figure 2. Our survey of occupations, presented here as a percent of households involved in each activity, reveals that small scale agriculture, whether for subsistence or commercial aims, is an important economic activity for nearly everyone.

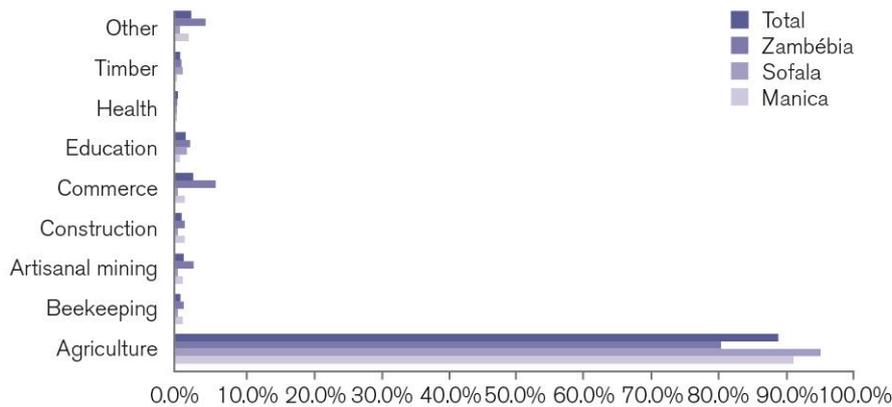


Figure 3. Firewood is local people's main source of fuel for cooking and heating. But although only a relatively small proportion of households produce charcoal, this form of biomass energy is a large scale industry meeting the energy needs of most of the region's urban population, particularly in Beira, Chimoio and Quelimane cities. Presented here are the main household energy sources by Province.

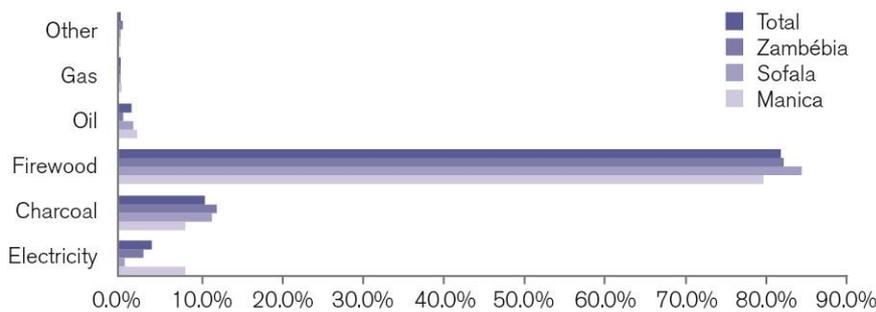


Figure 4. Household land holdings are mostly commonly 1–2 hectares, and almost all households have less than five hectares. Presented here are the amount of land households have used productively.

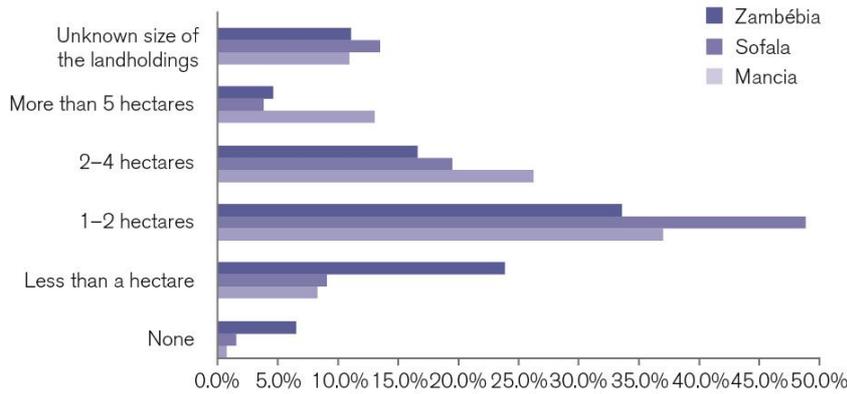


Figure 5. This presents households with registered land rights. Customary rights to land dominate and very few households have formally-registered land rights (see figure 6). This is because people can claim *de facto* land rights based on the labour they invest to clear forests. Local leaders often make a tacit allocation of land to be cleared. Mozambique’s land legislation protects unregistered rights acquired this way (good faith) if land is used for over a decade. But most people don’t know of this provision, hence the apparent lack tenure security. A decade is also a long period to be farming land without the inputs needed to keep it productive. This leads on to figure 7, on shifting cultivation.

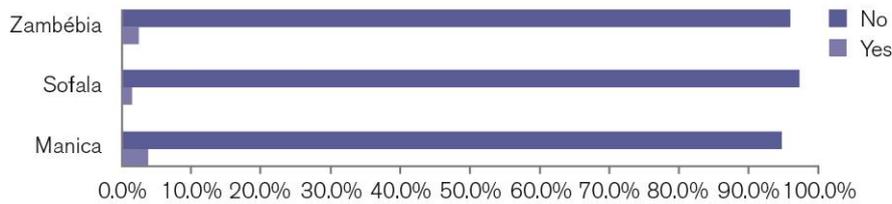


Figure 6. Land rights, whether formal or informal, can often be passed on within the family. About half of all households inherit their land, under five percent lease land and under ten percent use land on loan. The remainder acquire land through various other means including purchase. The figure below presents land access percentages.

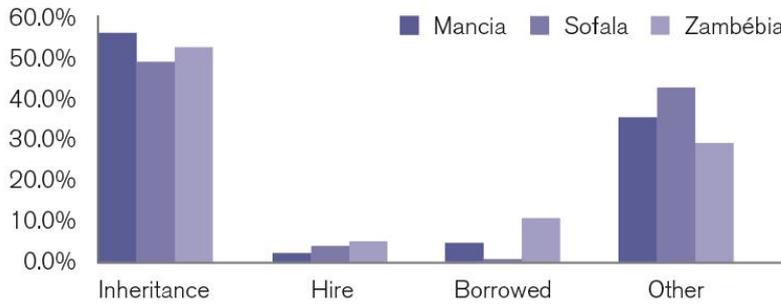


Figure 7. This presents how long households farm the same land. Most households practice shifting cultivation, farming land usually for less than 10 years, before moving on, and often clearing new woodland for fields, often using fire (see figures 10 and 11 below).

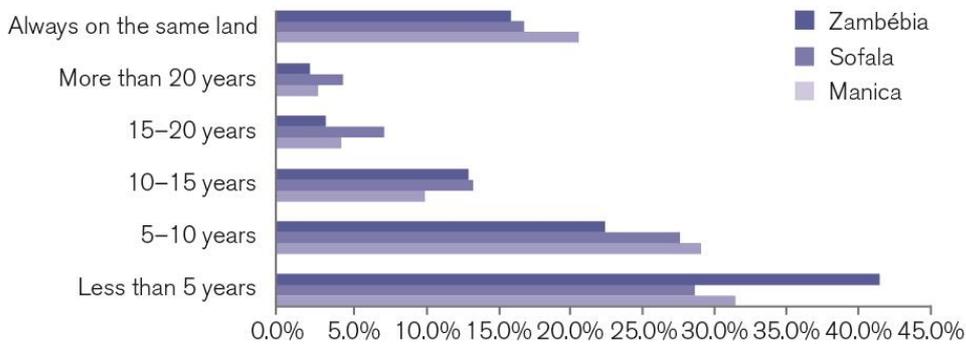


Figure 8. A few households practice more settled agriculture. We asked the reasons for cultivating the same plot of land, the main answers were 'because the land is still productive' and 'because new land is hard to acquire'. The results are presented in the figure.

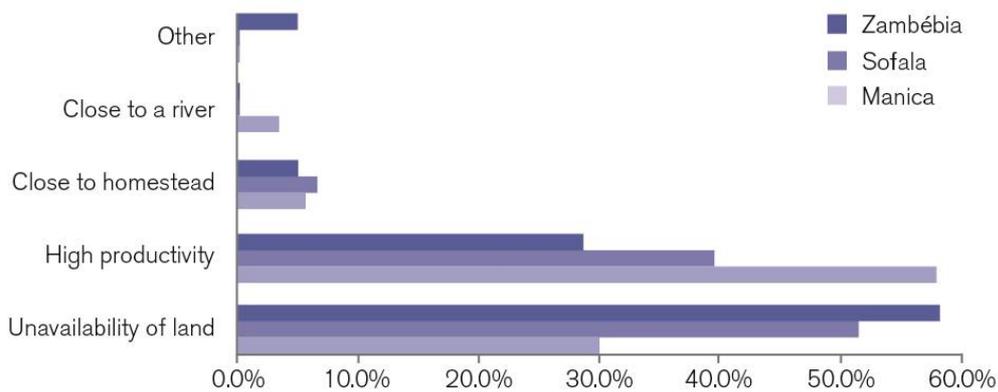


Figure 9. Our survey question on agricultural inputs shows why many people can't keep their fields productive: most have no fertilisers to boost productivity (nor access to improved seeds for higher yields or other agricultural technology). Presented below are the techniques households use to increase soil fertility.

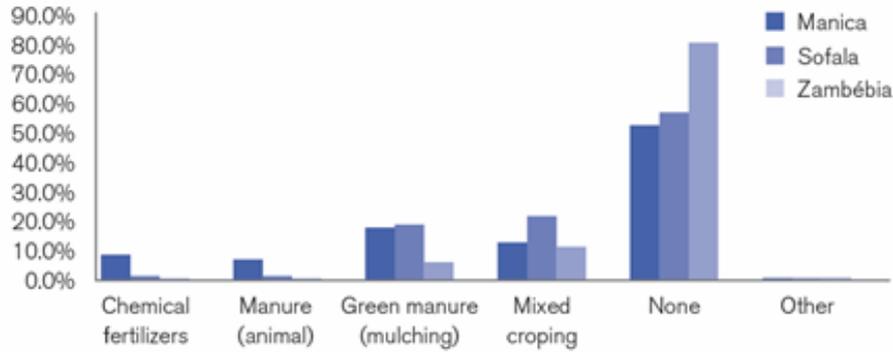


Figure 10. Almost all households use fire in the landscape, and most burn once a year. The frequencies of fire in a year are presented below.

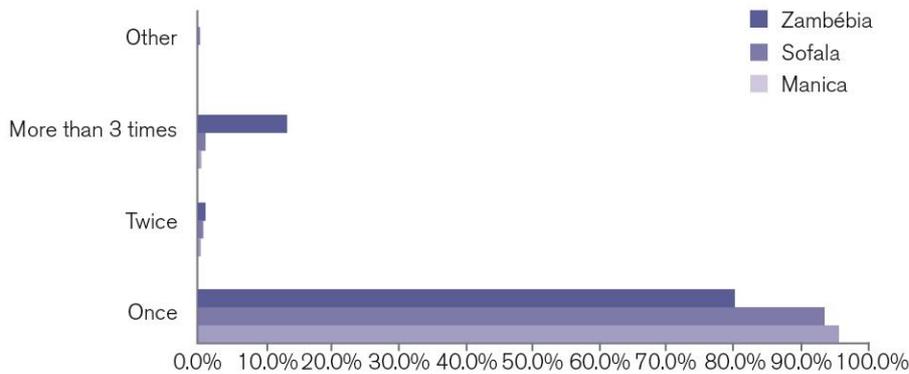


Figure 11. The reasons for fire starting are presented below, the main use of fire is for hunting small game. But fire is also used to clear new fields for agriculture.

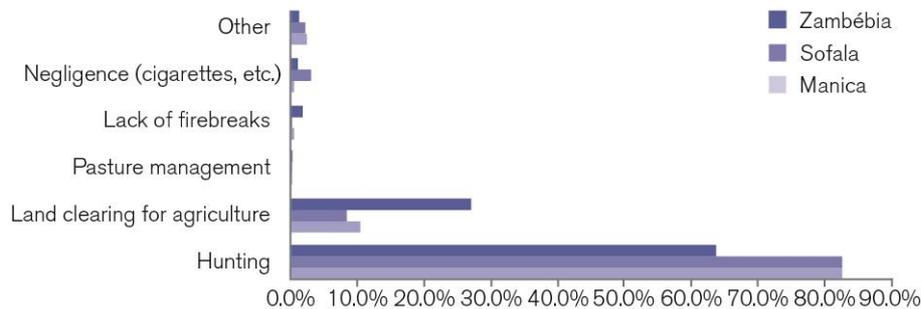


Figure 12. When we asked why people used fire (rather than simply what they used it for) relatively few said it made hunting easy, but many said it was the easiest way to convert wooded land to agricultural fields. Presented here are the responses on the positive impacts of fire.

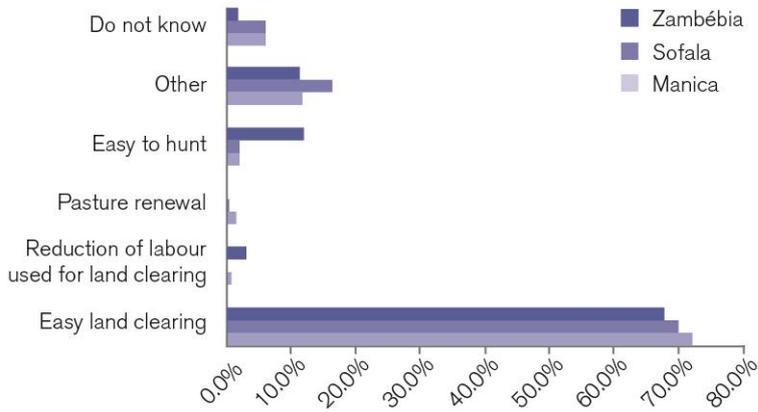


Figure 13. Presented here are the responses to the most useful forest resources. Only a small proportion of households is involved in logging, but almost everyone is collecting firewood.

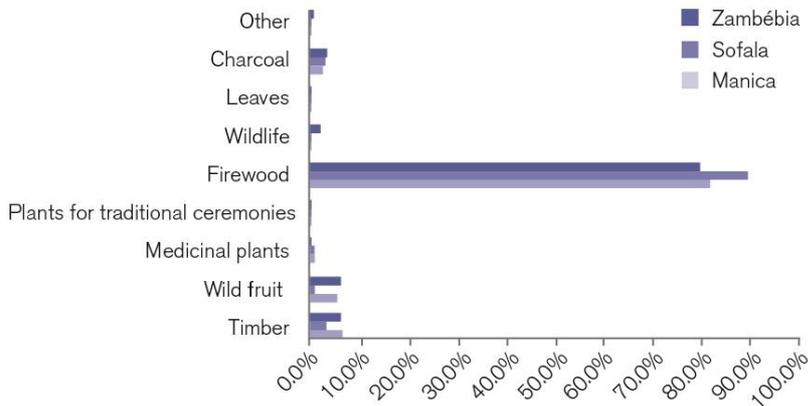


Figure 14. We asked why households harvest forest resources. The majority said personal consumption was their main reason for extracting forest products.

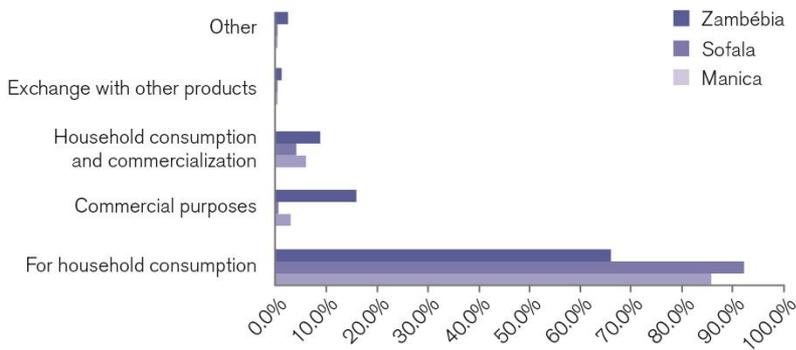


Figure 15. Overall, it's clear that agriculture dominates the household activities that lead to deforestation and forest degradation.

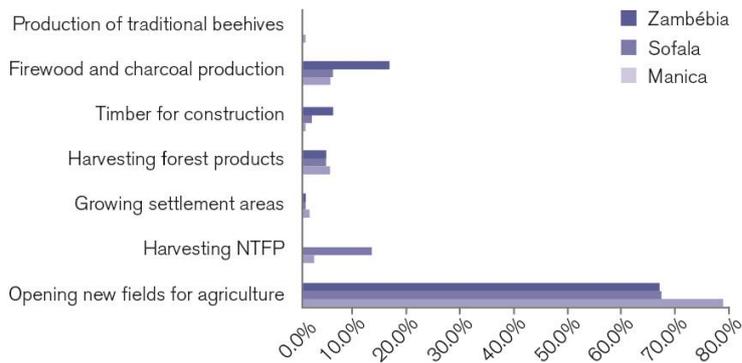


Figure 16. We asked households about their overall cash income over a typical three month period. Most people preferred not to reveal their income (either declining to answer or saying they didn't know) while those who would say reported a large variation. Gauging income from the full range of activities households undertake is not simple, and even reported incomes may be inaccurate (for example people might bias their response based on the perceived consequences, such as aid allocations). However, it seems most families generate under 10800 metical (around US\$230) per three months and very many generate under 5400 metical (about US\$119). Average household size was 6 in Manica, and 7 in Zambezia and Sofala, meaning daily cash income per head may be under \$0.20 for many, and under \$0.40 for most. This result reinforces the conclusion drawn from government data: that poverty has increased in recent years. This figure presents the results in metical.

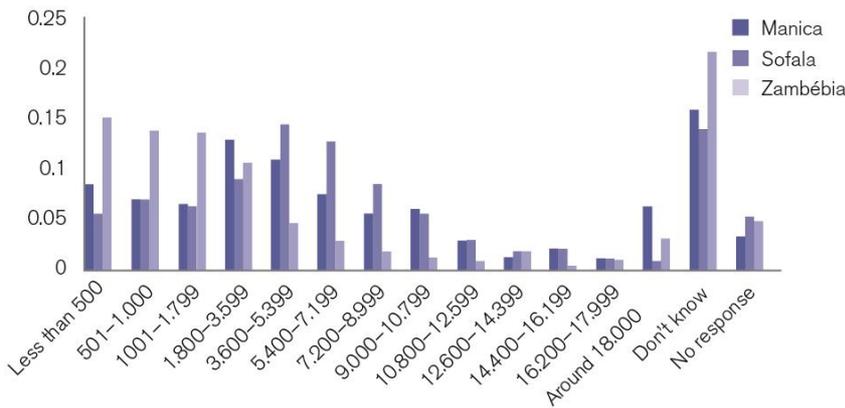
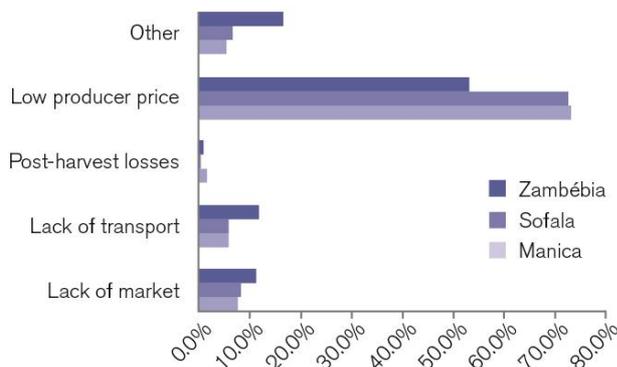


Figure 17. Finally, we asked people what marketing constraints were holding them back from raising their incomes. By far the most frequent answer was the low prices offered to producers. This is a crucial issue for building sustainable enterprises that yield benefits to land users. Economies of scale are important, and producers need to gather together in organizations to bundle their products. In all interventions supported under Testing REDD+ project, people are encouraged to work together in groups/associations. This ensure quantity and quality are complemented by better negotiating positions that achieve fairer deals.



So what does this imply for REDD+?

Sustainable and more productive agriculture is urgently needed

Without more sustainable and productive agriculture, deforestation will continue in Mozambique (and other countries with similar drivers) because it makes economic sense for households.

The solution is to introduce long-term sustainable land use and management that increases productivity. Poverty, particularly households' very limited cash incomes, means that agriculture is based on low input practices and misses out on fertility enhancing techniques and improved seeds that could result in higher yield. The lack, or limited coverage, of extension services is perpetuating this situation. Better extension services are needed to disseminate techniques for producing local improved seeds and to help farmers adopt more 'finance intensive' (rather than labour-intensive) practices.

When land is productive, people cultivate it for longer. Conservation agriculture with crop rotation, mulching and different sowing techniques, as well as agroforestry systems, are perhaps some of the 'low hanging fruits' that could replenish soil fertility over time while improving yields. Agroforestry systems, including improved fallow land and woodlots, can provide additional benefits by storing carbon and meeting energy needs from planted trees. Even if this is only viable at subsistence scales, the impact on deforestation will be significant because almost all households in the rural areas rely on agriculture. As part of the Testing REDD+ project, conservation agriculture and agroforestry interventions are being implemented by our local partner, ADRA (Adventist Development and Relief Agency) in four districts of Zambezia province, working with 1861 farming households.

Interventions must address both supply and demand of biomass energy

Biomass energy is being used for household consumption, but there is also masked commercialisation. Local people often blur the distinction between using the forest for their own needs and using it to generate a cash income. This emanates from a forest policy provision that says rural populations have a right to harvest forest products to meet their daily needs. This provision is meant to protect livelihoods and ensure benefits accrue to forest dependent people. But peoples' livelihoods are not just their direct consumption, as the law implies. Livelihood is also about employment and generating cash to meet household needs. Many rural households harvest biomass energy (and sometimes timber) for sale. They may transport charcoal by bicycle (3-4 bags of 50-60 kg at a time) to bypass officials enforcing bans on commercial extraction.

On the supply side, policy incentives should include security of resource tenure for biomass collectors so they have a long term incentive to manage forest resources or tree plantations. Fiscal incentives (such as reduced royalty payments for using efficient charcoal processing techniques) and improved enterprise support systems (such as helping producers to secure rights to forests, building their capacity to manage the forest sustainably and to use more efficient kilns for converting wood to charcoal) are also needed. This will reduce emissions from wood combustion as well as maintaining more standing trees (and so storing carbon).

On the demand side, both rural and urban consumption patterns can be improved through increasing the supply of affordable fuel efficient cooking stoves. These should be available for domestic but also industrial uses such as in bakeries, institutions such as boarding schools, correctional facilities, restaurants and other institutions housing a large number of people. Financial incentives should also be provided to improve access to alternative sources of energy such as solar, wind, electricity and gas. All these could be used more in the country. In fact gas exploration and the hydro-power production if directed to domestic market could overcome the current energy shortages in the urban markets. Hence reduce pressure on forests.

The private sector, in particular small and medium sized forest enterprises should play a key role in unleashing these measures' potential to reduce energy demands and mitigate climate change impacts. It will be crucial to link the middlemen and intermediaries (who hold licenses and buy charcoal from householders in local markets to sell on to large scale urban markets) to sustainable sources of biomass energy. With local partner ADEL (the Association for Local Development), we are beginning to address both supply measures (introducing sustainable management of natural forests, tree planting and efficient conversion of wood to charcoal) and demand measures (production and commercialisation

of improved stoves). ADEL is also working with middlemen (through the Sofala Charcoal Producers Association) to ensure that they buy sustainably produced charcoal.

Sustainable harvesting must be incentivised

Harvesting of timber and non-timber forest products must be made more sustainable, including by giving land users incentives for better behaviour and practices, rather than just disincentives (law enforcement has not been effective). Rather, law enforcement should be complemented by devolved responsibility that puts sustainable management back in the hands of land users.

Small and medium sized enterprises (SMEs) can be particularly important in providing incentives for sustainability, through their roles in value chains. This is possible because Mozambique's legislation gives commercial rights to high value forest products to small enterprises as well as local communities. But SMEs themselves need support in developing sustainable forest management plans, building business capacity, and in introducing processes that add value to timber and non-timber forest products.

The Testing REDD+ project is also helping local people switch to more sustainable forest products, for example by developing value chains for honey produced using conventional beehives (rather than using fire in traditional honey harvesting) and is further exploring potential for developing pharmaceuticals and cosmetic products. MICAIA Foundation is our local partner implementing this intervention in Manica.

As well as ensuring good quality natural products are being produced, there is also a need to help businesses scale up (and achieve economies of scale) so they can meet the growing demand from the middle class domestic market, from local pharmaceutical businesses and herbalists as well as from the international market.

Projects to make logging more sustainable are already showing the benefits of 'carrots' over 'sticks'. A two year negotiation led by IIED, with support from Mozambique's Forestry Department (at both national and provincial levels) and from the provincial cadastre/mapping service, is working with 24 small scale enterprises operating in more than 204,000 ha of forests in Zambezia. These enterprises, which hold short term logging licences, are working towards operating as long-term concessionaires. They are now congregated into nine enterprise associations and have been trained on legislation, on forest management, business development (including business organisation), financial management, planning and undertaking market studies. This intervention should lead to sustainable management of natural forest, restoration of degraded forest through tree planting, and will add value in the supply chain (for example through better use of dead wood).

Although only a few households are involved in timber harvesting (less than 10 per cent), the impact of logging on the forest is huge, as is the loss of government revenue when logging operates without licences. It is also important to recognise that logging is the start point for sequential activities, all of which can worsen deforestation and forest degradation. Logging extracts high value timber, but this initial extraction is followed by timber harvesting for charcoal production, which in turn means land is more likely to be converted to agriculture. All these drivers need to be addressed concomitantly within forest landscapes. Formalising small-scale logging, by organising it as well-supported SMEs, provides incentives for sustainability, creates employment and increases government revenue.

Long term planning and financing is needed

The Testing REDD+ project, and its associated interventions, received financial support from Norway from 2012-2015, for which we are very grateful. But this work remains in its infancy. Conducting the baseline line studies, identifying the interventions, mobilising interest from land users, building capacity as well as forming partnerships on the ground are all long processes. It can take at least two years of planning, organising, training and negotiating before interventions can actually be implemented. Gauging the impact of these emission-reducing activities is a much longer-term undertaking.

Conclusion

These solutions are not new ideas, so what is needed to leverage transformative change?

- Human capital is critically important – education and awareness raising at all levels is valuable. But availability of extension services can be the key to changing land use practices and behaviour, and so is fundamental to operationalising the solutions described above. Improving extension services could also be a very useful expansion of employment for a large and young local workforce. Making extension services a lynch pin for effective REDD+ hinges on government capacity to provide decent and remunerated employment. The private sector and NGOs can also strengthen their services. The investment offers both medium and long term benefits – improving agricultural production can also help other industries (such as food processing) develop.
- ‘Payment for results’ should be made – REDD+ performance based payments can provide an incentive for implementing long term sustainable use of forests. Land users who change their practices and behaviours need to be assured of an adequate financial reward.
- Even with our baseline surveys in place, scale will be important in demonstrating positive change in the Beira Corridor. REDD+ implementation projects should be large enough to ensure that they are representative. In other words, they must be big enough to convincingly show a difference between households that embraced change and those that did not.
- Financial resources for long term investment in sustainable solutions are crucial. Short term finance is not sufficient. It is time for government from developed and developing countries to lay a firm foundation. Most failed attempts to change land use patterns are design failures. Governments supporting REDD+, and development initiatives in general, need to ensure that the millions invested in starting up initiatives do not simply lengthen the list of failures. Support over a realistic timetable for achieving results is essential. Planning and investment horizons of at least 10 years seem reasonable to establish viable interventions, cement sustainable enterprises, and change behaviours and practices that will cumulatively address deforestation and forest degradation at scale.

A proviso: large scale investment remains the main driver of deforestation

This document looks at the role of households in the Beira Corridor, and shows their actions are a significant driver of deforestation and forest degradation. But it is important to remember the biggest drivers of deforestation are still large scale investments in land use change. This preeminent threat remains, and is the subject of numerous other reports.

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This report extracts summary information for the socioeconomic baseline research report (upcoming – expected at the beginning of 2016 in Portuguese)

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Project Materials

Climate change, forests

Keywords:

Reducing emissions from deforestation and forest degradation (REDD+), carbon, economic incentives



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Funded by:



This research was funded by the Norwegian government through its embassy in Maputo. However the views expressed do not necessarily reflect the views of the Norwegian Government.