



REDD+ hits the ground

Lessons learned from Tanzania's REDD+ pilot projects

Tom Blomley, Karen Edwards, Stephano Kingazi,
Kahana Lukumbuya, Merja Mäkelä and Lauri Vesa



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To contact the authors please write to:
Tom Blomley, tom.blomley@acacia-natural-resources.co.uk

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cover of this book. For a full list of publications please contact:
International Institute for Environment and Development (IIED)
80-86 Grays Inn Road, London WC1X 8NH, United Kingdom
newpubs@iied.org
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Abstract

In 2009, the Tanzanian government, together with the Embassy of Norway, launched a series of pilot projects with the goal of testing approaches to reducing deforestation and forest degradation (REDD+). These projects experimented with a range of different approaches to protecting forests and reducing carbon emissions, while supporting livelihoods and local economic development. In this report, we review the experiences and lessons learned from these pilot projects. We find that Tanzania's unique legal and institutional framework for decentralised forest management has provided new opportunities to test how communities can be engaged in REDD+, but that new challenges have emerged due to the trade-offs between setting aside forest areas for long-term protection and short-term needs for agricultural expansion.

The technical challenges of establishing robust measurement, monitoring, reporting and verification systems have been a major hurdle for most projects, which in turn have delayed the development of approved project design documents. Other challenges have been low carbon stocks within Tanzania's dry miombo forests and the high costs of implementing projects in remote areas of the country, which coupled with a weakening market for carbon, have undermined the economic viability of voluntary carbon projects. Limited interest from buyers in forest carbon has also meant that no projects have to date been able to sell carbon on the voluntary market.

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However, some of the new opportunities that have emerged include benefit sharing approaches, designed and endorsed by the final recipients. These offer the most promising models for ensuring continued support for forest protection and improved management. Individual payment approaches, while costly to establish and maintain, have been found to minimise risks of elite capture and ensure widespread support for REDD+ across a given community. In addition, the inclusion of free, prior and informed consent (FPIC) within project certification schemes has strengthened engagement between project proponents and participating communities, when compared with more mainstream approaches to community-based natural resource management (CBNRM) in Tanzania.

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Acronyms and abbreviations

AWF	African Wildlife Foundation
BAU	Business as usual
CARE	CARE International
CBFM	Community-based forest management
CBNRM	Community-based natural resource management
CCB	Climate, community and biodiversity (Standards)
CCBA	Climate, Community and Biodiversity Alliance
CFMA	Community forest management area
CIFOR	Centre for International Forestry Research
CO ₂	Carbon dioxide
CoFMA	Community forest management association
D&D	Deforestation and forest degradation
FAO	Food and Agriculture Organization of the United Nations
FPIC	Free prior and informed consent
FSC	Forest Stewardship Council
GIS	Geographical information system
HIMA	<i>Hifadhi ya Misitu ya Asili</i> (Protecting natural forests)
ICT	Information communication technology
IUCN	International Union for Conservation of Nature
JFM	Joint forest management
JGI	Jane Goodall Institute
JMA	Joint management agreement
JUHIBEKO	<i>Jumuiya ya Hifadhi ya Mazingira Tarafa za Bereko na Kolo</i> (Union for protection of environment in Bereko and Kolo)
JUMIJAZA	<i>Jumuiya ya Uhifadhi wa Misitu ya Jamii Zanzibar</i> (Union of community forest associations, Zanzibar)
JUWAMMA	<i>Jumuiya ya Watunzaji wa Msitu wa Masito</i> (Network for Forest Protection of Masito)
LULC	Land use and land cover
MCDI	Mpingo Conservation and Development Initiative
MJUMITA	Tanzania Community Forest Conservation Network
MNRT	Ministry of Natural Resources and Tourism
MRV	Measurement, reporting and verification
MtCO ₂ e	Million metric tons of carbon dioxide equivalent
NCMC	National Carbon Monitoring Centre
NGO	Non-governmental organisation
NOK	Norwegian Krone
OECD/DAC	Organisation for Economic Cooperation and Development / Development Assistance Committee
PDD	Project design document
PFM	Participatory forest management
REDD+	Reduced emissions from deforestation and forest degradation

RNE	Royal Norwegian Embassy
RS	Remote sensing
SCC	Shehia Conservation Committee (Zanzibar)
tCO ₂ e	Tonnes of CO ₂ equivalent
TFCG	Tanzania Forest Conservation Group
TNRF	Tanzania Natural Resource Forum
TZS	Tanzania shilling
UNFCCC	United Nations Framework Convention on Climate Change
UN-PEI	United Nations Poverty and Environment Initiative
URT	United Republic of Tanzania
US\$	United States dollar
VCS	Verified Carbon Standard
VER	Verified emission reduction
VLFR	Village land forest reserve
VLUP	Village land use plan
VNRC	Village natural resource committee
WCS	Wildlife Conservation Society
WWF	Worldwide Fund for Nature

Executive summary

While much has been written about REDD+ from a theoretical perspective, and much of it largely critical, little work has been done on analysing and documenting practical implementation of REDD+ activities on the ground. This report aims to fill this apparent gap by offering emerging lessons, experiences and insights gained from the implementation of REDD+ pilot projects across Tanzania between 2009 and 2015.

The pilot projects were designed to test local approaches to implementing REDD+ across a range of different social, institutional, tenure and ecological conditions. Funding for the REDD+ projects was provided by the government of Norway through the Royal Norwegian Embassy. Much of the material for this review was gathered from external evaluations of individual pilot projects that we undertook on behalf of the Norwegian government between December 2014 and May 2015. We also organised a two-day workshop in Dar es Salaam at which implementing organisations were encouraged to identify key lessons learned. We present these lessons in eight thematic areas, as summarised below and as presented as chapters in the paper:

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The feasibility and viability of REDD+ in Tanzania

When compared with other tropical countries with high carbon stocks, Tanzania presents many challenges from a REDD+ perspective in terms of its overall viability to support REDD+. Low rainfall across much of the country means that forests are generally relatively low in carbon. Drivers of deforestation and forest degradation are multiple, interlinked, locally-derived and inextricably linked to the actions of millions of rural land and forest users. Developing cost-effective strategies that can address such drivers at scale is immensely challenging. The size of the country, coupled with poor accessibility, means that the costs of establishing and running field-based activities are high. Compounding these challenges are the low prices and weak demand for carbon offsets on the global voluntary market. Despite these evident challenges, Tanzania has a unique legal framework, which presents unique opportunities for decentralised decision-making and locally-driven natural resource management. A key aspect of this enabling legal framework is Tanzania's participatory forest management programme.

Identifying and addressing drivers of deforestation and forest degradation

The main drivers of forest degradation, as identified by pilot projects, are the growing energy needs of an expanding population (principally charcoal) and the expansion of small-scale agriculture into non-farmed areas. At the local level, drivers are complex, multi-sectoral, and often interlinked. After detailed studies on local drivers of deforestation and forest degradation, pilot projects experimented and tested a range of different tools and approaches for addressing the drivers

with varying degrees of success, effectiveness and efficiency. Identifying the models and approaches that can be taken to scale is a crucial part of achieving emission reductions and other REDD+ results under a national or jurisdictional approach. This is an area where projects have been less successful, as many activities being implemented by projects require significant levels of staffing and financial support at a very local level. Pooling resources and creating partnerships with non-forestry organisations and institutions are approaches to address the agriculture and energy drivers in a more strategic and cost-efficient way and across a wider area. With regard to the different interventions practised by different projects, participatory forest management, community-based fire management and conservation agriculture appear to be the most effective approaches for addressing deforestation drivers in the Tanzanian context.

Adapting participatory forest management to a REDD+ context

REDD+ has created funding and implementation opportunities for scaling up participatory forest management (PFM) across different parts of the country. Many of the pilot projects used PFM as a key strategy to devolve control over forest resources to local communities, with 491,000 hectares (ha) of woodlands and forest under some form of local management as a direct result of pilot project actions. The use of PFM within the context of REDD+ has sparked a healthy debate regarding the goals, objectives and implementation of PFM within Tanzania. A key lesson is that REDD+, with its externally defined objectives of reducing carbon emissions and conserving carbon stocks, may distort local incentives for forest management by protecting larger areas of forest than would otherwise have been the case. REDD+ often conflicts with local demands for expanding agricultural production and such trade-offs need to be negotiated in a participatory and inclusive manner. A second key finding is that community-based forest management (CBFM), as practiced across Tanzania over the past two decades, may be resulting in high levels of leakage. Previous CBFM efforts have tended to be strongly focused on the management of specific areas of forest within village lands, with little attention to the management of trees on village lands outside community-protected areas. REDD+ projects have also generated valuable lessons with regard to the formation of inter-village aggregation entities that are able to present larger, economically-viable volumes of carbon to the international voluntary carbon market than would be possible from individual, dispersed and relatively small forest areas under PFM at individual village level.

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Benefit sharing

Benefit sharing arrangements in the context of natural resource management is a contentious issue that has stoked controversy within the Tanzanian PFM debate. Pilot projects, by including 'front-loaded' payments in their budgets, were able to experiment with benefit sharing models at individual, group and community levels. Individual payments, while accounting for high transaction costs, minimised risks of elite capture and were instrumental in creating high levels of awareness and support for avoided deforestation measures at the community level.

Consultation, stakeholder engagement and consent

Pilot projects have experimented over a continuum of approaches and although only one project explicitly included free prior and informed consent (FPIC) in its original design, at least three others, through an adaptive learning process, integrated FPIC practice into their implementation. The inclusion of a requirement to respect the right to FPIC as part of the climate, community and biodiversity (CCB) validation for REDD+ appears to have stimulated and incentivised more conscious practice and the facilitation of quality participation and community decision-making to achieve consent for REDD+ interventions in Tanzania, although initially perceived by many as only relevant to indigenous peoples. Pragmatically, it was recognised by most of the pilot project NGOs that engaging local people in project decisions is critical to ensure effective project implementation. Obtaining consent within the context of a REDD+ pilot project generated important benefits, but also resulted in delays and additional up-front costs.

Measurement, monitoring, reporting and verification

REDD+ pilots have experimented with a variety of approaches to measuring, monitoring, reporting and verification, all of them combining highly technical, remote sensing (RS) approaches with community-based forest carbon monitoring models. Piloting of participatory forest carbon monitoring in the context of REDD+ pilot projects has demonstrated that communities are capable of undertaking complex and technically demanding MRV tasks when sufficient training and incentives are applied. Due to the dependence on contracted external expertise, challenges with untested technology, the absence of national standards and a body for guiding MRV and hosting collected carbon data, some REDD+ pilot projects have not achieved their objectives of building a sustainable MRV system. No project has been able to feed data to national level forest carbon monitoring because the National Carbon Monitoring Centre (NCMC) is yet to become operational. The creation of different MRV approaches (and in particular forest stratification and data analysis protocols) has meant that comparison of datasets and results between projects is methodologically challenging.

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Getting projects to market

Getting REDD+ projects proved much more complex than originally anticipated. This was caused by a combination of factors, including a lack of internal technical capacity coupled with poor support from specialist service providers. However, many projects simply under-estimated the time, effort and cost of developing a comprehensive project design document of a sufficient quality to be validated externally. As a result of these problems, many projects missed their targets of producing project design documents (PDDs) by the end of their funding term. Problems have been compounded by the realities of getting validated projects to market – due to falling carbon prices as well as limited demand. These realities threaten both the viability and sustainability of project-based approaches in Tanzania.

Looking back down the road to REDD+

Many fears were being expressed both within Tanzania and internationally regarding REDD+ when the pilot projects were launched. These fears related to resource grabs, recentralisation of hard-won forest tenure rights, and a return to 'fortress conservation'. Our findings do not provide evidence to support these fears, in large part because of the widespread market failures associated with the REDD+ voluntary carbon markets. While far from perfect, many of the pilot projects went beyond previous approaches to secure consultation, to avoid elite capture of project benefits, and to strengthen forest management rights through community-based forest management.

Introduction and background

While the discourse surrounding REDD+ to date has been vibrant and frequently critical, there has been limited discussion around constructive approaches, grounded in field implementation, on how REDD+ can work in the complexities of the African context. This paper aims to address this gap by offering lessons, experiences and insights from Tanzania – a country with a strongly devolved legal framework to governance and natural resource management – on how REDD+ can work on the ground.

Tanzania, like many developing countries, has been engaged in developing national capacity and systems for reducing emissions from deforestation and forest degradation (REDD+) since around 2009. With support from the government of Norway as well as other international agencies, such as the UN-REDD programme, the government of Tanzania has been directing activities to two levels. At national level, a series of activities has been implemented to prepare for results-based financing. This includes the establishment of a National Carbon Monitoring Centre at the Sokoine University of Agriculture (SUA) in Morogoro, the development of environmental and social safeguards, the strengthening of inter-governmental coordination, as well as the setting up training and awareness-raising programmes at many levels.

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At sub-national level and in parallel to these national efforts, the Tanzanian government, with support from the Norwegian government, has supported NGO pilot projects across the country. These pilot projects were designed as a 'testing ground' for REDD+ in Tanzania, with the expectation that early, field-tested results and lessons would feed into and inform the evolving national REDD+ readiness process. Pilot projects were expected to contribute to one or more of the following four outcome areas:

- **Building local REDD+ readiness:** The aim was to build REDD+ readiness processes, including the establishment of the necessary local institutional arrangements for carbon stock monitoring, accounting, marketing and financing.
- **Policy testing:** Combined with research, communications and advocacy interventions, the pilot projects were set up to allow the testing of different REDD+ policies with a view to informing future policy development at a national level. These included benefit sharing, participatory monitoring, local governance and ways to address the deforestation and forest degradation (D&D) drivers.
- **Supporting broad stakeholder involvement:** By ensuring a wide geographic spread of projects across the country, it was envisaged that pilot projects would help to ensure sufficient diversity in terms of stakeholder perceptions, experience and involvement during the REDD+ readiness phase.
- **Delivering REDD+ results:** In addition to supporting REDD+ readiness, projects were also expected to deliver REDD-related results, such as measurable

improvements in forest condition, emission reductions from reduced deforestation, as well as social and environmental benefits from improved forest management. Projects were encouraged to include 'front-loaded' payments within their budgets to test payment and benefit sharing arrangements in the expectation of making longer-term carbon sales through the voluntary carbon market.

In February 2009, the Royal Norwegian Embassy (RNE) in Tanzania and the National REDD+ Task Force launched the pilot project process. More than 40 concept papers were received in response to a call for applications and out of these, a total of nine were selected for financial support. By the end of 2014, seven REDD+ pilot projects were completed according to plans.¹ One of the seven completed pilot projects, implemented by the Worldwide Fund for Nature (WWF), was fundamentally different from others as it mostly aimed at creating detailed carbon baseline data and building capacity of Tanzanian professionals in MRV. The seven completed projects designed to deliver REDD+ results are summarised below in Table 1.

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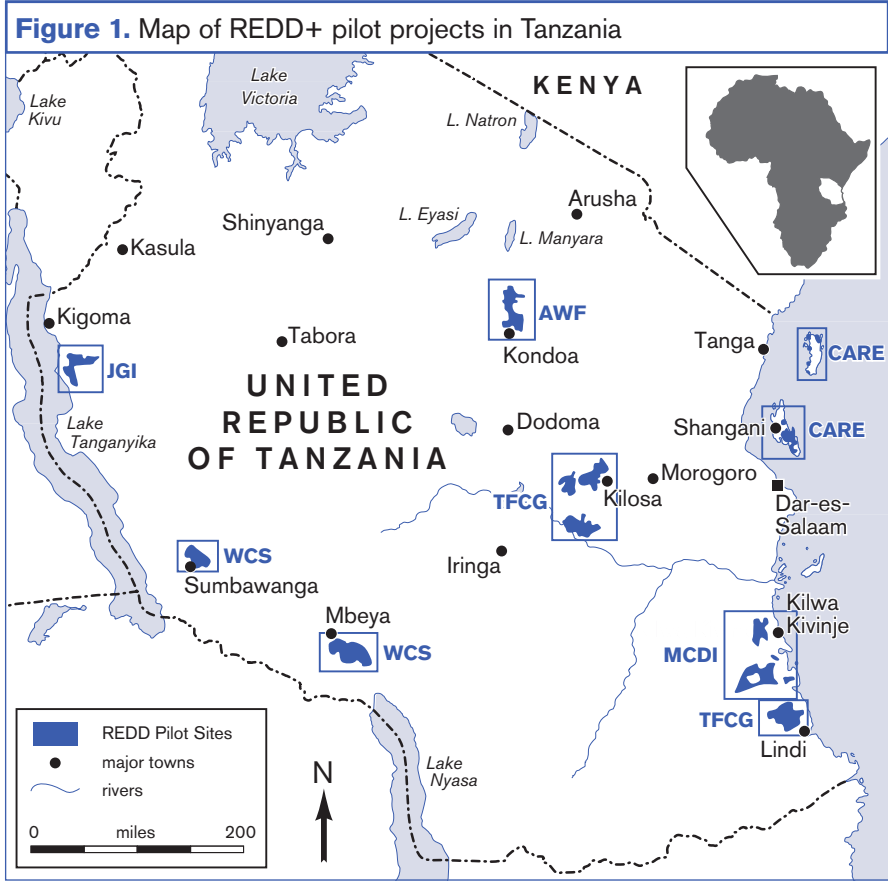
1. Two pilot projects, implemented by the Wildlife Conservation Society of Tanzania and the Tanzania Traditional Energy Development Organisation were discontinued due to financial reporting and audit concerns. These two projects are not included in the analysis.

Table 1. Overview of completed REDD+ pilots in Tanzania

Organisation and project title	Project description	Funding and timeframe
African Wildlife Foundation (AWF) <i>Advancing REDD in the Kolo Hills Forests</i>	<p>Purpose: Preparing local communities to participate in REDD as an incentive for long-term conservation.</p> <p>Where: Covers 18 villages and 71,632 ha of mixed land uses including 20,146 ha of forest.</p> <p>Actions: Assessing carbon and other benefits; enhancing REDD understanding; improving land and forest management; developing benefit sharing mechanisms (including trial payments); supporting livelihoods alternatives. Credits being validated by Plan Vivo.</p> <p>Outcomes: 12,832 ha of forests under PFM; 26,153 tCO₂e / annum reduced emissions (not verified).</p>	NOK 17.71 m 5 years Jan 2010 – Dec 2014
The Jane Goodall Institute (JGI) <i>Building REDD readiness in the Masito Ugalla Ecosystem Pilot Area</i>	<p>Purpose: Building awareness and enhancing capacity and governance for local communities and government to administer and benefit from REDD in high biodiversity forests.</p> <p>Where: Covers 90,989 ha of miombo woodland under varied ownership between 13 villages.</p> <p>Actions: Facilitating establishment of: inter-village CBOs to manage forests, replicable and scalable remote sensing method, community and CBO capacity to monitor carbon stocks, and community mechanism for equitably sharing carbon revenues; trial payments made.</p> <p>Outcomes: Conservation of 90,989 ha forest, anticipated (but not verified) 55,000 MtCO₂e emission reductions from avoided deforestation.</p>	NOK 19.32 m 3.5 years Jan 2010 – June 2013
Mpingo Conservation and Development Initiative (MCDI) <i>Combining REDD, PFM and FSC Certification in Southeastern Tanzania</i>	<p>Purpose: Using financial flows from REDD to expand PFM and Forestry Stewardship Council (FSC) certification of sustainable timber harvesting in village land forest reserves.</p> <p>Where: Southern-coastal Tanzania. 10 villages with 17,829 people</p> <p>Actions: MCDI used REDD revenue to off-set start-up costs for PFM and FSC certification (combining REDD, PFM and FSC); Community based fire management.</p> <p>Outcomes: 96,112 ha under CBFM; 27,600 MtCO₂e reduced emissions (not verified).</p>	NOK 13.64 m 5 years Jan 2010 – Dec 2014
Tanzania Forest Conservation Group (TFCG) and Community Forest Conservation Network of Tanzania (MJUMITA) <i>Making REDD Work for Communities and Forest Conservation in Tanzania</i>	<p>Purpose: Pro-poor approach to REDD, generating equitable financial incentives for communities sustainably managing or conserving Tanzanian forests. Performance-based. Communities directly access REDD finance. Credits validated by VCS and CCB.</p> <p>Where: 27 villages (49,025 people) in two districts. High biodiversity hotspots.</p> <p>Actions: Assisting communities to market emission reductions generated through interventions that aim to address the main deforestation drivers including CBFM, improved agriculture, improved forest governance and land use planning; national and international advocacy on REDD policy; performance-based payments made.</p> <p>Outcomes: 152,000 ha of miombo / coastal forest conserved; 39,896 t CO₂e reduced emissions verified in Lindi from 2012 to 2013.</p>	NOK 41.40 m 5 years Sep 2009 – Dec 2014

<p>CARE Tanzania Hifadhi ya Misitua ya Asili (HIMA) / Piloting REDD in Zanzibar through Community Forest Management</p>	<p>Purpose: Ensuring REDD+ benefits contribute to reducing poverty and enhancing gender equality. Where: 45 Shehias, (113,845 people) on Zanzibar and Pemba islands. Actions: Promotes community forest management through: Addressing drivers; Improving governance, including equitable benefit sharing; Ensuring poor benefit and are not further disadvantaged; Controlling leakage, eg domestic woodlots and income generating alternatives; Mainstreaming gender. Outcomes: 82,754 ha of forested land protected by community forest management areas (CFMAs); 581,252 t CO₂e reduced emissions (not yet verified)</p>	<p>NOK 38.77 m 4.5 years Apr 2010 – Dec 2014</p>
<p>Wildlife Conservation Society (WCS) REDD Readiness in Southwest Tanzania</p>	<p>Purpose: Develop capacity and knowledge to participate in REDD, while establishing sustainable alternatives. Where: In and around protected areas (PAs) in four forests in Southern Highlands (52,680 ha). 40 villages (70,000 people). Actions: Baseline study, Provide methods for estimating degradation, deforestation, carbon sequestration, emissions, leakage; Provide carbon data; Demonstrate appropriate tools for implementing and monitoring REDD; Estimate expected emission reductions levels; Provide economic incentives (and address drivers), including benefit sharing, environmental education, and alternative forest resource provision. Outcomes: 50,000 people reached with environmental education; 250 ha woodlots established. No data on emission reductions.</p>	<p>NOK 9.3 m 4 years July 2010 – June 2014</p>
<p>Worldwide Fund for Nature (WWF) Tanzania Enhancing Tanzanian capacity to deliver short and long-term data on forest carbon stocks across country</p>	<p>Purpose: Contributing core data to the Tanzanian national MRV system that forms a part of the comprehensive forest carbon monitoring system for the country, and build capacity for sustainability in the future. Where: Across seven major vegetation types in seven regions. Actions: Baseline carbon plots, Hemispherical photographic survey, Light detection and ranging (LiDAR) technology further tested, soil carbon survey, future scenarios for changes in carbon stock, capacity building. Outcomes: 522 soil samples collected and analysed; 128 one-ha permanent carbon monitoring plots established and assessed</p>	<p>NOK 13.9 m 4.3 years Jan 2011 – March 2015</p>

Tanzania is a diverse country, with a range of ecological conditions and forest types – including highland montane forests, dryland acacia and miombo woodlands as well as coastal forests. Pilot projects were strategically selected to ensure a wide geographic and coverage of the country to include these diverse conditions (see Figure 1).



Source: WCS.

When the REDD+ pilot projects were launched in 2009, REDD+ as a concept was largely unknown in Tanzania. Awareness and understanding of REDD+ within the government and civil society was extremely limited. Even among international conservation NGOs, capacity was low. No national REDD+ strategy had been developed, and at international level, the now-familiar discussions on monitoring, reporting and verification (MRV), reference levels, carbon baselines, and accounting and safeguards had yet to take place. At the international level, fears were being expressed that REDD+ would inevitably lead to a 'resource grab', whereby powerful interests would capture the rights to forest areas with a view to generating carbon credits, thereby displacing traditional resident forest users (Phelps *et al.* 2010).

We were commissioned by the Norwegian Embassy in Tanzania to undertake external final evaluations of six of the seven pilot projects between January and May 2015 (NIRAS 2015a-f). The JGI project was reviewed in 2014 separately because it closed in 2013. Given the strong focus on learning, policy testing innovation and experimentation that was implicit within the pilot project approach, the RNE also commissioned a study on lessons learned from the seven pilot projects (NIRAS 2015g). The findings we present in this publication draw extensively on these six evaluations and one overall synthesis report. Chapter 4 of this report draws heavily on an article we submitted for publication in the *Journal of East African Studies*.²

2. Blomley *et al.* (in preparation).

Methodology and approach

Given the explicit focus of the pilot projects with regard to learning and informing, many of the implementing agencies have already undertaken internal reviews of lessons learned during the course of implementation.³ Cross-project exchanges of lessons learned have also been facilitated to a lesser extent by the Tanzania Natural Resources Forum (TNRF) and the International Union for Conservation of Nature (IUCN), although these were undertaken when the projects were in their early stages.⁴ In total, 12 publications have been produced that seek to identify and describe lessons learned from Tanzania's experiences in implementing REDD+. Our review of lessons learned differs from previous ones conducted in three key ways:

- It took place after all projects had been completed.
- It was written by an independent team with no direct role in implementation.
- It places the Tanzanian experiences within a wider, global context of emerging experiences from other sub-national implementation initiatives.

As such, we provide lessons that try to answer two key questions:

- What unique aspects of Tanzania's political, legal or ecological situation provide valuable lessons / experiences that are of use to both Tanzanian and international audiences engaged in REDD+?
- What unique aspects of the Tanzanian pilot project experience provide useful lessons and experiences to other REDD+ practitioners working on similar initiatives but in different countries?

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The main methods we used in this review include:

- Reviewing and synthesising the findings and conclusions of the final review of pilot projects.
- Reviewing and synthesising literature and documentation already produced by pilot projects.
- Reviewing global literature and lessons relating to emerging experiences with REDD+ pilot projects and the evolution of REDD+ more generally.
- A two-day workshop with participating NGOs to identify and explore lessons learned, held in Dar es Salaam in March 2015.

This publication is written primarily with practitioners in mind – both in Tanzania and internationally – in the hope that some of the experiences and lessons identified here can be adopted by others.

3. See for example: Jarrah 2014.

4. See for example: TNRF 2011.

The feasibility and viability of REDD+ in Tanzania

Carbon stocks and deforestation drivers

Woodlands occupy 44 million ha (or 91 per cent) of the total forest area of Tanzania (MNRT 2014). Despite this relatively high level of coverage, biomass is relatively low (estimated to be around 55.1 m³/ha). The associated carbon stocks in Tanzanian woodlands are estimated to be 17.5 tC/ha comparing unfavourably with more well-stocked forests in rainforest nations such as Indonesia, Democratic Republic of Congo and Brazil, where carbon stocks are generally in the region of 120-140 tC/ha (FAO 2010). In Asia and Latin America, deforestation is driven largely by large-scale, commercial food, oil and fibre production (such as beef, soya, plantation forestry, rubber and palm oil). In Africa, however (and in particular sub-Saharan Africa), forest degradation predominates, driven by more locally-derived factors such as fuelwood collection, subsistence agriculture, charcoal production and livestock grazing (Kissinger *et al.* 2012; Streck and Zurek 2013). This results from the actions of numerous individuals harvesting forests for timber, charcoal and firewood, as well as from slash-and-burn agriculture, which takes place in forested landscapes. Measures to address forest loss must therefore work at a sufficiently local level to engage with rural farmers and forest users.

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Implementing REDD+ in Tanzania: costly and slow

In countries such as Tanzania, the costs of working at community level in remote, poor and inaccessible parts of the country are high. Approved methodologies under VCS for measuring and reporting on forest degradation, caused by the actions outlined above, are currently unavailable or prohibitively expensive and as such, more imprecise tools are needed to assess forest loss through deforestation. The MCDI project identified fire as being the biggest driver – accounting for the greatest levels of forest degradation. Unable to find any suitable methodology that could measure and report on forest degradation through fire, the project produced a new methodology under VCS, which has recently been approved (VCS 2015). Again, this has both cost and time implications, and without the support of a flexible funding agency, this would have been well beyond the financial means of a national Tanzanian NGO.

With the prevailing low carbon prices on the international voluntary market (currently around US\$3-5/tonne), the overall viability of market-based approaches is questionable, given the high transaction, opportunity and institutional costs required to implement REDD+ activities in Tanzania. The TFCG/MJUMITA project calculated that they would need to sell carbon above a threshold price of US\$7/ tCO₂e if they were to pay communities at a minimum rate of US\$3.25/ tCO₂e, as well as maintain (and expand) current levels of support to communities (MJUMITA 2014).

As seen in other sub-Saharan countries, forest loss in Tanzania is largely caused by forest degradation and not deforestation (we define the latter as wholesale clearance of forest and conversion to other uses). The agents of forest degradation are generally small-scale farmers expanding agricultural production through extensive systems of slash-and-burn agriculture. As such, any measure to address these drivers must work at this level, by empowering those local level actors to manage forests more effectively while improving local level agricultural practices. Forty-six per cent (21.9 million ha) of all forests and woodlands in Tanzania are found on village land⁵ and are therefore under the authority of elected village governments (MNRT 2014). The Forest Act (2002), drawing in turn on the Local Government Act (1982) and Village Land Act (1999), recognises this and provides village governments with the mandate and necessary incentives to claim and manage forests on village land. The availability of these enabling laws means that transaction costs for REDD+ projects in Tanzania are arguably lower than in other similar sub-Saharan countries with a less favourable legal environment.

The importance of site selection and 'knowing your drivers'

Tanzania is a diverse country and covers a range of agro-climatic conditions, forest types and population densities. As such, deforestation and forest degradation drivers vary significantly across the country in both their nature and their intensity. Given this high variability, different sites have very different potential (and viability) for implementing REDD+ interventions – something that was clearly demonstrated by different pilot projects. Furthermore, initial assessments of deforestation drivers were often changed following more detailed studies undertaken during project implementation.

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TFCG/MJUMITA, with support from Forest Trends, had the most thorough site selection process, which used both pre-screening as well as selection criteria to identify those areas with the highest potential for generating the greatest impacts (Forest Trends 2010). Criteria included factors such as area of unreserved forest (suitable for inclusion with village-managed forest reserves); biodiversity; carbon density; leakage risks; population density (ratio of community size to available forest area); deforestation levels and opportunity cost. Despite this very thorough process, new threats emerged during the project in one of the two project sites – namely an influx of migrants from nearby areas, who are clearing land and planting tobacco, something that was unforeseen when the initial site selection was taking place.

MCDI initially assumed that the biggest deforestation driver in their project area was charcoal production (and therefore had designed a project based around sustainable charcoal production). However, after careful study, it became clear that at current levels, commercial charcoal production was a minor factor – and, as mentioned earlier, fire was in fact the biggest driver of forest change in Kilwa

5. Village land is a category of rural land that is administered by village governments.

district. As such, a fundamentally different approach was needed to address REDD+ (Ball and Makala 2014).

AWF initially selected a government forest reserve in which to develop a REDD+ project, given its high value as a water catchment area for a downstream national park (Tarangire). However, when it became apparent that current methodologies of measuring and accounting for forest degradation within protected areas were complex and largely untested, it became necessary to expand the project area and approach to include reforestation and support to forest protection within community-managed forests.

The JGI project identified a large area of contiguous miombo woodland, shared between 15 villages. However, disagreements over tenure of the forest (specifically whether it would be managed by district or village governments) resulted in long delays, disputes and ultimately the project being delayed well beyond its funding period.

Summary of key messages

- Tanzania presents many challenges from a REDD+ perspective in terms of its relatively low forest carbon stocks, complex and locally-derived drivers of forest degradation, its size and accessibility.
- Low prices and weak demand for carbon offsets threatens the viability of voluntary market carbon projects.
- Despite these challenges, Tanzania has a unique legal framework, which provides for decentralised decision-making and management of natural resources, and ensures that local actions can be taken effectively.
- High levels of variability across the country in terms of local deforestation rates, deforestation drivers and tenure regimes means that project site selection is a key factor in determining the viability of local actions.

Identifying and addressing drivers of deforestation and forest degradation

Deforestation drivers – in the global and Tanzanian context

A comparative study conducted in 46 countries showed that commercial agriculture is the most important direct driver of deforestation globally, followed by subsistence agriculture, while timber extraction and logging drives most forest degradation (Verchot *et al.* 2014). Other important drivers of degradation are fuelwood collection and charcoal production, uncontrolled fire and livestock grazing. The most important underlying or indirect drivers are economic growth based on the export of primary commodities and an increasing demand for timber and agricultural products in a globalising economy (Kissinger *et al.* 2012). In REDD+ readiness plans, many countries identify weak forest sector governance and institutions, lack of cross-sectoral coordination and illegal activity (related to weak enforcement) as critical, indirect drivers. Population growth, poverty and insecure tenure are also cited. The Tanzanian national REDD+ strategy identifies charcoal and firewood harvesting, illegal logging, forest fires and agricultural expansion as the top deforestation drivers; and weak law enforcement, poor forest governance, conflicting policies and market failures as indirect drivers (URT 2013).

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A study by CIFOR in 2014 in 48 REDD+ countries on monitoring of direct and enabling interventions to address the D&D (Salvini *et al.* 2014) found that the most commonly identified direct interventions are sustainable forest management, fuelwood efficiency / cook stoves, agroforestry, protected areas strategies and afforestation or reforestation. Also agricultural intensification, permanent agriculture, plantations establishment and management and livestock rangeland management are widespread interventions. Concerning enabling interventions, the most common are stakeholder involvement (including CBFM), tenure and rights regularisation and policy and governance reform. The study goes on to state that many of the REDD+ activities identified are likely to have a relatively low carbon impact per unit area, but can have significant cumulative effects over large areas. Usually a combination of interventions is needed to address the drivers: for instance, agricultural intensification should be combined with zoning, protected areas or rehabilitation of degraded lands to prevent further forest clearing, and this should be backed up by support at policy levels (Skutsch and McCall 2010).

Addressing deforestation and forest degradation in Tanzania

Current estimates show that current harvesting in Tanzania exceeds the annual allowable cut by 7.6 million m³. Increasing woody biomass in plantations, the promotion of agroforestry practices and reducing slash-and-burn agriculture (through conservation agriculture, for example) offer solutions to these trends. This must be implemented together with measures to reduce consumption – such as the promotion of improved stoves, improved efficiency in processing and use

of waste material, as well as a shift in energy patterns. Enhancement of carbon stocks has been a common aspect of many pilot projects: CARE International and WCS supported both planting of fast growing exotic species for fuelwood and pole production, while AWF promoted production through boundary planting agroforestry. Regeneration of mangroves through planting was supported in Zanzibar, which is an acceptable activity under REDD+. Conservation agriculture was promoted in a number of projects including JGI, TFCG/MJUMITA and CARE International. Most pilot projects successfully supported the building of local organisations and institutions to plan and manage the use of village land and community forests as an enabling intervention. This had a significant impact on improving security of land tenure and control over the common property forests. All projects worked on PFM apart from WCS.

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At the local level, drivers are complex, multi-sectoral and interlinked. The most important drivers identified by the pilot projects include agriculture (both slash-and-burn and the opening of new permanent agricultural areas), commercial woodfuel (charcoal and firewood) harvesting, brick making as well as fire. Overall, the final project evaluations identified that projects had little success in addressing energy drivers for a range of reasons – including insufficient or incomplete strategies, interventions, capacity and/or budgets. Most drivers are outside the forestry sector and require skills beyond the core competencies of many conservation NGOs. The creation of new partnerships between conservation NGOs and external service providers was a valuable approach in increasing local effectiveness. Interestingly, although all the projects identified population growth as an important driver of deforestation, only JGI had family planning and reproductive health activities (which were funded separately). Despite the complexity, a key lesson learned from TFCG/MJUMITA, as well as the MCDI projects, was the need to first understand and prioritise different drivers and then work on the principal driver in a focused manner. Focusing on multiple drivers is complex and results easily in overall loss of efficiency.

Almost all the pilot projects in Tanzania conducted studies to identify deforestation drivers, but only MCDI's studies resulted in a major change in approach. The pilot projects mostly focused actions on activities that had been already defined in the original project document. The MCDI project did, however, completely redirect its emphasis due to the findings of research conducted to identify deforestation drivers. Originally the project aimed to address the two drivers of shifting cultivation and charcoal production. Further study revealed however that in Kilwa district population pressure was still low, and that forest cover change was primarily driven by wildfires, which occur every one to three years at the peak of the dry season. The annual forest carbon loss through wild fires exceeds by 60 per cent that caused by shifting agriculture. The project now concentrates on the introduction of fire management through early burning, practised by VNRCs. This is a relatively low cost intervention with the potential for scaling up to other areas of the country facing similar conditions.

Addressing the most important driver, smallholder agriculture, has had some success but it is expensive and time consuming. It will be impossible to scale up impacts without extensive collaboration with agricultural research and extension organisations. Agriculture drives D&D either through the opening of new permanent farming areas or through the slash-and-burn plots, and is the most important driver in pilot project areas. This has been addressed by participatory land-use planning, improved agricultural extension services and increased enforcement of local by-laws that control the use of the village land and forest. Planning to zone the village area has achieved a significant change in land use patterns in the AWF villages in Kondo; by-laws are now enforced to regulate the number of cattle, to restrict grazing from erosion-prone areas and to regulate the use of village forests. Furthermore, land use planning teams active in land management and governance have been created, such as in TFCG and AWF villages. In Zanzibar, community forest management areas (CFMAs) identified core REDD+ forests and utilisation forests where shifting agriculture can also be practised by obtaining a permit from the Shehia Conservation Committee. On the islands, land is limited and it is of crucial importance to address agricultural productivity if emissions are to be reduced. Food security is a major issue as drought, labour constraints and low yielding varieties prevail in rural Tanzania; more forest needs to be converted to subsistence crops such as maize and also sesame, which is an increasingly popular cash crop due to growing international markets. TFCG worked on conservation agriculture by training and subsidising farmers to use better maize seed, and improve soil moisture retention and crop spacing, showing that a major increase in production could be achieved.

Summary of key messages

- The main drivers of forest degradation, as identified by the pilot projects, are the growing energy needs of an expanding population, coupled with small-scale agricultural expansion. At the local level, drivers are complex, multi-sectoral and often interlinked.
- After detailed studies on local drivers of deforestation and forest degradation (D&D), pilot projects experimented and tested a range of different tools and approaches for addressing the drivers with varying degrees of success, effectiveness and efficiency.
- Identifying the models and approaches that can be taken to scale is a crucial part of achieving emission reductions and other REDD+ results under a national or jurisdictional approach. Pooling resources and creating partnerships with non-forestry organisations and institutions is an effective approach to addressing the agriculture and energy drivers in a strategic and cost-efficient way.
- Participatory forest management (which in turn emphasises the creation of local incentives for sustainable forest management), community-based fire management and conservation agriculture appear to be the most effective approaches in addressing deforestation drivers in the Tanzanian context.

Adapting participatory forest management to a REDD+ context

PFM in Tanzania – legal basis and current status

There is a considerable overlap between the goals of REDD+ and PFM with regard to the long-term protection and management of natural forests. Overall, both PFM and REDD+ aim to maintain forest cover, reduce conversion to other non-forest land uses, restrict unsustainable resource use, and generate long-term benefits to local users. As such, PFM is increasingly seen as a means to address local deforestation drivers. In countries with a strong legal jurisdiction relating to community tenure over land and forests, such as Tanzania, Nepal, Bolivia and others, PFM is being used as a basis for advancing REDD+ (Newton *et al.* 2014). Tanzania's national REDD+ strategy describes PFM as 'a valuable basis for REDD+ readiness' (p. 9) and proposes using REDD+ finances to scale up PFM across Tanzania as a way of reducing prevailing high levels of deforestation and forest degradation (p. 19) (URT 2013).

Tanzania has a well-established PFM programme that builds heavily on existing land and local government laws. Two forms of PFM exist in Tanzania – joint forest management (JFM) and community-based forest management (CBFM) (Blomley and Iddi 2009).

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- **Joint forest management** is a collaborative management approach, which divides forest management responsibility and returns between government (either central or local) and forest adjacent communities. It takes place on land reserved for forest management such as national forest reserves and local government forest reserves. It is formalised through the signing of a joint management agreement (JMA) between village representatives and government (either the district council or the Tanzania Forest Service).
- **Community-based forest management** takes place in forests on 'village land' (land which has been surveyed and registered under the provisions of the Village Land Act (1999) and managed by the village council). Under CBFM, villagers take full ownership and management responsibility for an area of forest within their jurisdiction. Following the legal transfer of rights and responsibilities from central to village government, villagers gain the right to harvest timber and forest products, collect and retain forest royalties, undertake patrols (including arresting and fining offenders). In addition, they are exempted from local government taxes (known as 'cess') on forest products and are not obliged to remit any part of their royalties to either central or local government. The underlying policy goal of CBFM is to progressively bring large areas of unprotected woodlands and forests under village management and protection through the establishment of Village Land Forest Reserves.

As of 2008, more than 2,300 villages (18 per cent of all villages nationally) had become engaged in PFM, with 1.6 million ha of forest under JFM and 2.1 million ha under CBFM, representing about 11 per cent of all forested land in Tanzania (Blomley *et al.* 2008). Since 2008, PFM has continued to expand, much of it with support from REDD+ pilot projects in different regions of the country.

PFM and REDD+

Within the context of REDD+ pilot projects in Tanzania, most projects supported some form of community involvement in forest management as a means to reduce deforestation and forest degradation. Pilot projects directly supported PFM processes in over 491,000 ha of woodlands and forests across the country. Some projects have helped communities gain legal title over land and forests through the establishment of village land forest reserves (CBFM), while other projects carry out JFM initiatives around forests managed by central government – often with high biodiversity values. One project (JGI) supported the emergence of new forms of forest management – where previously unreserved forests were managed under an inter-village community-based organisation. The absence of any recognised legal framework for this arrangement has however meant that by the end of the project, forest tenure for this area of forest remains unresolved.

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At the time when REDD+ was being endorsed by government as a new policy, views were mixed, both in Tanzania and elsewhere, regarding the potential impact of REDD+ on forest and land tenure rights. Some feared that increasing the value of natural forests through REDD+ could lead to a ‘resource grab’, involving either the government recentralising control over forest tenure, or powerful private sector interests buying up, or leasing, large areas of forested land and excluding local users in the process (Phelps *et al.* 2010). Others were concerned that REDD+ would lead to the return of ‘fortress conservation’ by both government and conservation NGOs, justifying a return to evictions and displacement of forest dependent communities (Beymer-Farris and Bassett 2012). Others struck a more optimistic note, suggesting that if well implemented, REDD+ had the potential to ‘unblock’ systemic or structural barriers that have hindered PFM’s expansion and adoption across the remaining unreserved forests in Tanzania (TFCG 2009). The following section discusses whether these hopes and fears have played out in practice through the implementation of the REDD+ pilot projects across different parts of the country. We review whether REDD+ helped or hindered the dissemination of PFM, by attempting to answer some key questions relating to effectiveness and impacts.

Did PFM lead to better forest management and reduced emissions?

PFM was designed, primarily, as a tool to support improved forest management. A number of studies have been undertaken in Tanzania to assess the performance of PFM against this goal. Although results are somewhat mixed, the general consensus has been that forests managed either fully or jointly by communities tend to be in better condition than those managed exclusively by the state (Blomley

et al. 2008, Persha and Blomley 2009; Lund and Treue 2008 and Treue *et al.* 2014). These findings confirm similar studies on the performance of community forestry elsewhere in the world (Bowler *et al.* 2010). However, the results are not entirely consistent – a recent study of seven forests under CBFM and three under JFM showed that half were being managed unsustainably, with extraction levels exceeding annual growth rates (Ngaga *et al.* 2013).

The advent of REDD+ has sparked a discussion regarding the impacts of PFM at a wider level of scale and the impacts of improved protection in one area on adjacent areas of forest, which are not subject to such stringent management practices. The displacement of harvesting from one area to another (known as ‘leakage’) may be widespread, leading to negligible net changes in deforestation or forest degradation at higher levels of scale (Balooni and Lund 2014). Much of the PFM promoted prior to the advent of REDD+ in Tanzania was designed to assist communities to protect forest areas that were important to them. This could be water sources, cultural or traditional forest areas, or areas used for grazing livestock during the dry season when other grazing areas are exhausted. In many cases, these areas represent the best-managed forests within their village area. CBFM, in effect, becomes a tool to protect areas that were not under a significant threat of deforestation, but perhaps subject to limited unregulated use and in need of improved management. Given a free choice, experience with CBFM to date in Tanzania has shown that villagers will set aside a relatively small proportion of their total forest area for protection and management, while leaving a relatively larger area for future agricultural expansion or harvesting for timber, firewood or charcoal (Morgan-Brown 2014). Under prevailing models of CBFM, therefore, harvesting and forest clearance continues in unreserved forest areas on village land, while small village land forest reserves are protected by village governments. The net effect across the whole village land area, however, is continuing forest clearance and conversion to alternative land uses. This implies a more holistic approach that considers trees both within and outside village-managed protected areas, the use of village land use planning tools, and the application of village by-laws to cover all trees within the village area.

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One potential solution to this challenge lies with participatory land use planning (known in Tanzania as village land use planning (VLUP) to reflect the importance of village governments as a level of scale for planning and the institutional structures in which planning is embedded). While the national land use planning guidelines issued by the Ministry of Lands and Human Settlement (URT 1998) emphasise the importance of reserving locally important areas of forest for community use, the primary focus is on calculating and allocating future agricultural land use needs and zoning forest areas accordingly (Morgan-Brown 2014). As such, VLUPs promoted across Tanzania represent a ‘business as usual’ (BAU) scenario where forest is cleared as demands for land increase in line with population trends, based on current use patterns. Under REDD+ however, project proponents need to show how the BAU scenario will be altered through the actions of the project (for the purpose of demonstrating additionality).⁶

6. ‘Additionality’ in this context refers to evidence that any reduction in emissions from a REDD+ project is genuinely additional to reductions that would occur if that project were not in place.

Community-based land use planning is widely seen as a way in which local land use decisions can be effectively planned and regulated and as such have been strongly supported by REDD+ projects, both in Tanzania and elsewhere. However, experience has been very mixed. One of the main criticisms has been that plans are done as 'one-off' exercises, rarely followed up, and with no real framework for implementation or monitoring built in. As such, there are few sanctions if plans are not followed, and no incentives in place to encourage plan implementation (UN-PEI 2008). In other parts of the world, participatory land use planning has been criticised as it has failed to link to and address the real drivers of land use change (such as incoming private sector land-based investors with high level political linkages) (Rock 2004). In the Congo Basin, the effectiveness of participatory land use planning was found to be relatively limited due to insecurity of land tenure. Land users are generally not landowners and therefore not empowered to take long-term decisions, and they lack any incentives to undertake long-term investments designed to improve productivity (Yanggen *et al.* 2010).

Two of the REDD+ pilot projects (TFCG and AWF) used land use planning as a tool to address issues of leakage. By working with a series of neighbouring village areas, they were able to establish land use planning across a relatively wider area. In both cases, efforts were taken to ensure widespread participation in the production of the plan, and in the case of TFCG, the VLUP formed the basis of discussions (and eventually, a signed agreement) around securing free, prior and informed consent (FPIC). Contrary to experiences elsewhere, implementation of the plans appears to have taken place relatively effectively. The underlying reasons for this were found to be three-fold. Firstly, there are sanctions for infringements of agreed plans. These include fines levied by the village government using village by-laws, and also reduced revenues from REDD+ dividends, caused by non-performance. Secondly, the plans were closely anchored to village governments, which as legally mandated, government institutions had authority and responsibility to oversee implementation. Thirdly, the plans were developed in a participatory manner, reaching down to sub-village level and ensuring broad input from across the community.

Did PFM generate tangible benefits for local forest users and managers?

Although PFM in Tanzania has made considerable progress in achieving a significant level of scale and adoption, research has shown that it has yet to generate notable and tangible economic incentives for local forest users (Persha *et al.* 2014). A study conducted in southern Tanzania established that, in 14 villages with village land forest reserves averaging around 2,600 ha each, villages generated annual revenues of around US\$540 per year in 2002, rising to around US\$720 per year by 2005 (Lund 2007). Finances generated from JFM areas are much less – averaging US\$189 per village per year (Blomley and Ramadhani 2006). The reasons for this relatively low generation of income are many, but include the fact that many CBFM sites were degraded when handed over to communities and required a long lead-in time while forests recovered and until sustainable harvesting could be undertaken at a significant scale. Secondly, forests under JFM tend to be high biodiversity areas with very limited legal use and hence almost no opportunities for commercialisation of harvested forest

products. Thirdly, there is a prevailing belief among many government foresters that forests should be protected, conserved and subject to minimal levels of forest harvesting (Blomley *et al.* 2009). At the same time, PFM has involved significant opportunity and transaction costs for communities, in terms of foregone forest use and individual and institutional time committed to forest management operations (Merger *et al.* 2012). Financing from REDD+ has been seen by some as a means through which these costs can be offset (Khatun *et al.* 2015).

Most of the NGOs implementing the pilot projects (with the exception of CARE International and possibly MCDI) have a clear mandate and goal to protect and conserve biodiversity. As such, a number of organisations began discussions with communities over the conservation and protection of forests in ways that limit or minimise local use. In the case of JGI, this initial starting point proved untenable and communities made it very clear that some form of sustainable use would be needed if community support was to be secured, primarily to cater for local, domestic needs for firewood and other forest products.

Despite local demands, most NGOs considered that sustainable, commercial extraction of forest produce was considered complex, risky, likely to generate high emissions and hard to account for. TFCG have a sister project working within one of their two project REDD+ pilot areas that is supporting sustainable charcoal production within four of the REDD+ project villages. At around US\$25 per ha per year, sustainable charcoal production generates more revenue per ha than when managed for REDD+ (with no commercial use). As such, there are trade-offs to be made between generating carbon credits (where use is minimised) and generating revenues from sustainable harvesting. TFCG analysis suggests that sustainable charcoal production results in 50-70 per cent permanent reduction in the carbon stocks of the areas being managed when compared with strict conservation.

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Although projects have generated important co-benefits (such as improved land and forest tenure rights), it is looking increasingly likely that the interests of communities might have been better served if external support had been directed to helping communities access less risky and more accessible markets for sustainably harvested forest products (such as charcoal and timber). Being driven by the externally defined goal of reducing carbon emissions (with the expectation that performance-based payments would continue in the long term through voluntary market carbon sales), local goals for forest management appear to have been displaced. This is made more worrying by the fact that long-term payments have yet to materialise.

In effect, the MCDI project has addressed this concern, as its primary focus is helping communities establish secure rights to land and forest and then helping them to develop sustainable harvesting of FSC-certified timber for export markets. Payments from reduced emissions (which it is hoped can be secured from the sale of verified credits on the voluntary carbon market) will not go to communities, but instead be used to fund the expansion of CBFM and sustainable forest management by the implementing agency (Ball and Makala 2014).

Four of the REDD+ pilot projects included trial payments within their budgets with the aim of making 'front-loaded' payments to test benefit-sharing mechanisms and generate early incentives for improved forest management. This had the effect of putting cash in the hands of either individuals or elected village institutions and was an important catalyst for local level forest management.

Did REDD+ help speed up the formalisation process for PFM agreements?

Joint forest management has been a high priority for both government and development partners, given its potential to help protect high biodiversity forest reserves under threat from encroachment and unregulated harvesting (Blomley and Ramadhani 2006). However, although many agreements have been successfully negotiated, a limited number have been formalised through the signing of legally binding agreements, as specified in law. Data provided by the Ministry of Natural Resources and Tourism in 2008 found that across mainland Tanzania, 863 villages were involved in JFM processes, and only 155 (18 per cent) had resulted in signed agreements (URT 2008). A more recent study of JFM across 110 randomly selected JFM sites found that only 8 per cent had signed JMAs (Persha *et al.* 2014). One of the underlying reasons for this is that while forestry laws provide for JMAs, they are silent on how management costs and benefits should be shared. The matter is further complicated by the fact that much of the JFM in Tanzania is concentrated in high biodiversity forests. While these forests deliver a range of crucial environmental services to the nation (through conservation of water sources that provide water for drinking, industrial use, irrigation and power generation) and the global community (through conservation of biodiversity), their contribution to local users is highly limited as consumptive use is heavily restricted (Blomley and Iddi 2008).

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Of those JMAs that have been signed, the general trend is that agreements are made to cover a period of five years. While this does, potentially, provide opportunities for the agreements to be revisited and revised after a five-year period, it does leave the door open to agreements not being renewed, thereby leaving communities in a somewhat precarious position of investing time and effort in the hard work of restoring forests – only to have any negotiated access rights taken away once the forest condition begins to improve. Many forests targeted under JFM were in a poor condition, having been subjected to decades of neglect and poor management by central government. Although no nationally agreed ratios were developed until 2014, agreements that were concluded generally left communities with 20-30 per cent of benefits that were accrued from forest management, with the remaining balance going to either central or local governments (Blomley and Iddi 2008).

Despite these evident risks, two of the REDD+ pilot projects opted to work in forest areas administered by government and proposed the development of legally binding agreements over the shared management of forests. AWF, working in Kondoa district, targeted Isabe and Salanaga Forest Reserves, which are under central government management. CARE International, working in Zanzibar where

all land is administered by the Zanzibari government, proposed to facilitate the agreements for the joint management of CFMAs. Perhaps as a result of the relatively high political profile accorded by being REDD+ pilot projects, both projects were able to successfully negotiate legally binding agreements between communities and government over forest management within a relatively short period. Given demands for permanence under REDD+, agreements in both sites have been made, covering a period of 30 years. Furthermore, both agreements specify clear agreements on how forest management benefits (in this case revenues from the sale of voluntary market REDD+ credits) are shared, which in both cases resulted in more than 80 per cent of net REDD+ dividends being allocated to communities or community organisations.⁷

Did REDD+ help with the low economic viability of small and fragmented forest patches managed under PFM?

Although the total area of unreserved forest in Tanzania remains relatively high, the average size of forest areas reserved by village governments remains relatively small. Data from the Ministry of Natural Resources and Tourism suggests that the average area of village land forest reserves in Tanzania is around 1,600 ha (URT 2008). The poor condition of many of these forests when they were incorporated under community management, coupled with limited use options imposed by village governments, means that opportunities for sustainable harvesting are limited (Mustalahti and Lund 2009). Under REDD+, given low carbon prices, total forest areas being managed need to be significant if they are to generate any appreciable revenues to local managers.

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Within the context of REDD projects, forest areas managed by communities varied significantly. In the context of the TFCG/MJUMITA project, village forests varied between 1,500 to 8,000 hectares, while in another project working in central Tanzania (TaTEDO) village forests were much smaller (1.5-10 ha each). At the level of the individual community, small forest size and the transaction costs of measurement, monitoring, reporting and verification were considered too high to support the marketing of carbon credits and as such, a common feature across many projects was the creation of an 'aggregation entity'. These were in effect intermediary organisations, designed to represent local interests by reducing REDD+ transaction costs for individual participating villages and increase economies of scale.

As none of the pilot projects have yet to sell carbon credits on the voluntary market, none of these bodies have become fully operational. However, useful lessons can be drawn from the experiences so far. Different projects attempted this in different ways. TFCG/MJUMITA proposed establishing a community carbon enterprise, which would be accountable to individual member villages involved in selling carbon but would bundle credits from across all villages for sale to potential buyers.

7. In the case of the AWF project in Kondo, a ratio of 80:20 was agreed between communities with signed agreements and central government, while in Zanzibar, 50 per cent of gross revenues was agreed for communities with CoFMAs, 35 per cent to a civil society organisation representing CoFMA interests and the remaining balance to tax and project developers.

MJUMITA, which operates as a loose network of community forest user groups, has established contracts between itself and each participating village government. In Zanzibar, CARE International helped create a new institution – JUMIJAZA, a network of individual community forest management associations (CoFMAs), which, it is hoped, will aggregate and sell verified emission reductions (VERs) to the international carbon market. Trial payments (included within the project budget) were made to individual CoFMAs through local management structures (known locally as Shehia Conservation Committees). JGI, in their project, facilitated the emergence of an NGO (known by the Kiswahili acronym – JUWAMMA) – that was constituted from individual village governments for the shared management of the Masito forest.

Institutional capacity and sustainability of intermediary aggregation bodies is a key issue identified by a number of projects, with the conclusion that capacity development efforts need to be targeted towards such institutions at a very early stage in project implementation, and sustained investment needs to be made over a long period (Jarrah 2014). By the end of donor funding, few if any of the aggregation entities have either the capacity or financial flows to be able to operate independently of NGO support, and poor results in selling carbon credits has further undermined their long term viability. Despite their limited effectiveness, however, they do offer potential insights into how products (both carbon and non-carbon) could be marketed and sold from forest areas, which on their own would not be seen as economically viable. MCDI is already in the process of establishing a community-driven intermediary organisation that builds on these experiences, representing village level interests in the marketing and sale of certified timber from village forests (Ball and Makala 2014). Such models could usefully be scaled up in other areas where communities have expressed interest in collaboration around the sale of sustainably-harvested forest products, such as charcoal or timber.

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Summary of key messages

- The use of participatory forest management (PFM) as a principal tool for addressing local deforestation drivers within the context of REDD+ has generated useful lessons and experiences when compared to previous, more established approaches to implementing community forestry in Tanzania.
- Externally-defined objectives of reducing carbon emissions (which call for large areas of forest to be protected) may conflict with local demands for expanding agricultural production due to growing demands for land; and such trade-offs need to be negotiated in a participatory and inclusive manner.
- Approaches to community-based forest management (CBFM) as practiced across Tanzania over the past two decades may be resulting in high levels of leakage, as management efforts tend to be strongly focused on the management of village land forest reserves, but with little attention to the management of trees on village lands, outside community protected areas.
- Demands under REDD+ for 'permanence' are providing impetus for the extension of JFM agreements of up to 30 years in duration, which provides increased tenure security for local communities.
- Fragmented, dispersed and relatively small sites managed under PFM require aggregating entities to be able to present larger, economically-viable volumes of carbon to the international voluntary carbon market.

Benefit sharing

Benefit-sharing models and the risks of elite capture

Modalities for the sharing of carbon finance benefits between communities, private sector NGOs and government agencies is a subject that attracts a great deal of attention at national, jurisdictional as well as project levels. Civil society organisations representing indigenous peoples and local communities in particular have expressed fears regarding benefit sharing relating to corruption risks, equity, transparency and governance (Standing 2012). A range of frameworks has been developed to guide the sharing of carbon benefits from REDD+, most of which are guided by principles of effectiveness, efficiency and equity (the '3Es') (Angelsen *et al.* 2009). Related to the 3E debate is the concept of 'trade-offs' – or reconciling the demands for efficiency with broader concerns over equity. Pursuing a deliberately pro-poor approach will generate additional transaction costs and generally results in a reduction in efficiency. However, ignoring equity concerns may create elite capture and social conflict, which can in turn undermine efficiency.

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Benefits can be allocated on the basis of performance or inputs (Behr *et al.* 2012). Performance-based arrangements distribute benefits on the condition that the stakeholders receiving the benefits have achieved a predefined, measurable and verifiable standard of performance against a baseline. Input-based arrangements distribute benefits on the basis of agreements with beneficiaries to either carry out specified actions, or refrain from certain actions, in return for monetary or non-monetary benefits. Under input-based systems, no link is provided between the distribution of benefits and measurable performance (or outcomes) in forest condition. In some cases, countries or projects may evolve in their approach, moving from an input-based scheme to one that is more explicitly based on performance. Others have argued that adopting a benefit-sharing approach based solely on performance (defined in terms of emission reductions) runs the risk of inequitable outcomes and the creation of perverse incentives (through rewarding large landowners engaging in illegal deforestation, for example) (Peskett 2011).

A number of studies on PFM, as well as CBNRM in general, have pointed to the tendency for elite capture (Lund and Saito-Jensen 2013). In the Tanzanian context, this is often manifested by village natural resource committees concentrating or monopolising cash benefits generated from forest management. Vyamana *et al.* (2008) identified a number of ways in which elite capture takes place within the context of PFM, such as:

- the imposition of fees and license costs for forest harvesting which automatically excludes participation by poor households;
- limited representation of poor households within village natural resource committees;
- few if any formalised opportunities for households to hold committees to account;
- deliberate exclusion of poor households in the widespread belief that these

households are responsible for unregulated forest harvesting and as such have little to contribute to resolving the problem; and

- limited knowledge by forest users of their rights or the responsibilities of elected forest management committees.

In a study undertaken in Iringa by Lund and Treue (2008), it was shown that while overall revenues from forest management in Mfyome village had increased dramatically since the establishment of CBFM, poorer members of the community (who had previously been highly dependent on open-access harvesting of charcoal) were now becoming increasingly priced out of the market – and becoming wage labourers to more established charcoal producers. Blomley *et al.* (2008) suggested that where the flows of benefits are particularly low (such as in JFM situations), forest management becomes in effect privatised by the village management committee. By concentrating these benefits within a small group of people, incentives may become sufficient to maintain active management by a small group of people.

Cutting the cake: how projects approached benefit sharing within pilot projects

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Projects developed different approaches to sharing REDD+ revenues as well as different systems for allocating benefits between participating communities. Four projects included cash payments to communities in response to efforts to reduce deforestation (Table 2). Three of the projects allocated payments on the basis of inputs (the implementation of forest management activities) while only one developed a performance-based approach that paid communities on the basis of emission reductions and changes in carbon stocks. These payments, made from donor-funded project budgets were meant to mimic and pilot performance based payments that were anticipated through the future sale of carbon credits on the voluntary market. One project (MCDI) did not make cash payments to communities, but instead supported communities to generate cash from the sale of certified timber.

Project	Way in which cash benefits were disbursed	Basis for allocating benefits	Benefit sharing formula adopted during trial payments
TFCG / MJUMITA	Individual cash payments made to all registered village residents. For children (under age of 16) payments made to mothers.	Performance based – payments based on 'stock-flow' approach – which rewards participating communities on the basis of emission reductions against a historical baseline as well as the maintenance of carbon stocks.	MJUMITA will retain the carbon project operational costs; 5% remitted to local government. The rest will go to individuals within participating villages.
AWF	Cash payments to village governments through JUHIBEKO, an inter-village council that represents the 13 participating villages. Payments were used for community projects.	Input based-payments based on efforts to address deforestation drivers. Criteria cover two broad areas – efforts to introduce sustainable forest management and efforts to address deforestation/forest degradation drivers.	In JFM forest - 60% of funds go to JUHIBEKO for patrolling and project operations, 20% to communities and 20% goes to the Tanzania Forest Service / district. In VLFRs, all revenue goes to village government.
CARE International	Cash distributed through JUMIJAZA (Zanzibar community forestry network) to 40 village level Shehia Conservation Committees. Used for conservation, community development and social / charitable projects selected by village residents.	Input based – using two broad criteria: (1) Forest bonus payments (total forest area, condition of the forest, % of forest set aside as conservation area, number of trees planted); (2) Social bonus payments (women participation in leadership, number of meetings carried out by a SCC and number of female-headed households).	At least 50% of revenues go to SCCs through JUMIJAZA; a percentage retained by JUMIJAZA for project implementation (up to 35%); 5% retained by Terra Global Consulting; 5% may be retained by government.
JGI	Cash distributed through the JUWAMMA account and on to 7 pilot villages.	Input based – payments calculated based on inputs by communities on forest management (for example, number of patrols, number of times action was taken on illegal harvesting, efforts made to reduce fire incidence).	10% retained by JUWAMMA to cover operational costs and 90% to 7 pilot village accounts.
MCDI	No cash revenues were distributed. Funds from timber sales to forest management and community projects, including social development.	Each village earns funds from timber sales from its own forest. Similarly, verified emission reductions (VER) will be sold according to the size of the forest. Later on villages will be paid directly for emission reductions.	Income from timber sales go directly to the Village Council and Village Assembly decides how funds are distributed.

The way in which cash payments were distributed varied between projects. Three chose to channel funds to village governments through a community-based organisation composed of representatives from participating villages. Revenue generated from harvesting of timber in the MCDI project is received by village governments who then allocate funds to a mix of forest management, local development and social security activities through meetings with community members. One project (TFCG/MJUMITA) took an alternative route of making individual payments to all members of participating communities. Village assembly meetings were asked to make a decision on how cash benefits should be received and distributed. In all cases, villagers chose to pay all community members equally through individual cash payments (Box 1). This was in recognition of the fact that forests are owned collectively as a community asset and any dividends arising from improved management should also be shared on the same basis. A committee, elected by villagers, was given responsibility for compiling a list of residents (who have had permanent residence in the village for at least two years). The list was published and a period given for any disagreements or omissions to be corrected. Payments are calculated by simply dividing the total village dividend by the number of registered residents. Children (under the age of 16) receive payments, but through their mothers.

Box 1. TFCG / MJUMITA model for benefit sharing

The total dividend allocated to participating villages is based on measured performance in reducing deforestation against a historical baseline.

- Village Assembly meetings make a decision to reward all community members equally, given the fact that forests are owned collectively as a community asset and any dividends arising from improved management should also be shared on this basis.
- A committee, elected by villagers is responsible for compiling a list of residents (who have had permanent residence in the village for at least two years). The list is published and a period given for any disagreements or omissions to be corrected.
- Payments are made by dividing the total village dividend by the number of registered residents. Children (under the age of 16) receive payments, but these are made to the mother.

Although the transaction costs of administering individual payments are higher than when payments are made to village institutions, the project has effectively ensured complete participation within the project, widespread support and awareness for the aims of the project (while avoiding any risk of elite capture, a phenomenon widely seen in other PFM initiatives in Tanzania).

One challenge encountered is that opportunity costs of implementing REDD+ actions are differentially distributed within communities. Those who have been heavily dependent on forest product harvesting or expansion of agricultural lands face the greatest costs, but receive no more (or less) than others experiencing lower opportunity costs.

Channelling forest management revenues (either from REDD+ or in the case of MCDI, from forest harvesting) to community level management bodies has been standard practice within Tanzanian PFM for many years, in large part due to the existence of elected governments at village level who have the mandate and responsibility to perform this function. While this has the advantage of reducing transaction costs for the implementing agency and uses existing institutional structures, it exposes individual community members to risks of elite capture, as reported in other studies. In the CARE International project implemented in Zanzibar, decisions relating to use of funds were taken by committees operating at the Shehia level. However, a missing element, as reported by CARE, was transparency regarding how decisions were made by these committees and how individuals or projects were finally selected (Jarrah 2014). Similar problems were reported from the MCDI project, where despite communities being involved in decision making, doubts prevailed among community members about how finances are managed in some communities (Khatun *et al.* 2015)

The model supported by TFCG / MJUMITA was very popular at community level, but was vigorously opposed by key government decision makers at national level. Fears were expressed that money would be 'wasted' or used 'unproductively' and not reinvested back into sustainable enterprises. Interviews conducted at community level showed that 35 per cent of household dividends from REDD+ were used for entrepreneurial activities aimed at increasing their agricultural productivity, livestock keeping, or starting a small business (Morgan-Brown 2014). Furthermore, villagers were asked if they would be comfortable contributing a portion of their individual dividends to their respective village governments in support of public infrastructure projects. A number of villages opted to do this, but where trust and confidence in village leaders was limited, villagers preferred to retain all funds at individual level. This has helped force a discussion on accountability and trust which otherwise may not have happened, had funds automatically been allocated to village governments. Ensuring that REDD+ dividends went to all members of the community, on an equal basis ensured a widespread awareness of the project and effectively eliminated opportunities for elite capture. However, it is recognised that while such approaches may be both effective and equitable, transaction costs are higher than more established approaches where funds are received and managed by village governments.

Summary of key messages

- Tanzanian REDD+ pilot projects have experimented with a range of local-level benefit sharing arrangements, both in the way benefits are disbursed, but also in the way in which benefits are calculated and shared.
- Cash payments, made at the individual level, have high transaction costs but they show success in building accountability, generating important local economic impacts and reducing the risk of elite capture.
- Performance-based (rather than effort, or input-based) payments appear to have triggered greatest local action and incentives for reducing deforestation.
- Communities make sensible decisions on how revenues should be shared and used, if a transparent, equitable and participatory process can be supported.

Consultation, stakeholder engagement and consent

The concept of FPIC within the context of REDD+

Free prior informed consent (FPIC) applies to REDD+ regarding potential changes in resource use that could impact the rights of indigenous peoples and forest dependent communities. Under these circumstances, potentially impacted peoples have the right to participate in, consent to, or withhold consent from, a proposed action (UN-REDD 2013). As such FPIC differs from the concept of participation and consultation, neither of which specifically requires that the right to withhold consent on externally proposed interventions, or a process of dealing with grievances during the project implementation, is provided.

The right to FPIC is enshrined in international agreements including the United Nations Declaration on the Rights of Indigenous People (UNDRIP) in 2007, which was signed by Tanzania). FPIC is not a stand-alone right but emerges as a principle of international human rights law, including the right to food, the right to own property and the right to self-determination.⁸

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FPIC is a recent and somewhat contested term in Tanzania (Campese 2011), where there is a widespread view that 'Tanzania does not have indigenous peoples', although many traditional pastoralist, agro-pastoralist and hunter-gather communities contest this.⁹ The National Strategy for REDD+ (2013) contains a section that addresses the rights of communities dependent on forests and the impact of REDD+ programmes on such groups. This could be interpreted as a willingness to embrace such groups' right to FPIC.

The use of FPIC by pilot projects

To a large extent, engaging local people in project decisions was already the practice and experience of most of the NGOs implementing the pilot projects, so as such was nothing new. However, approaches were variable in relation to the quality of the engagement, the information provided, and the scope of the process to reach all community members. The actions taken by pilots can be viewed along a continuum in terms of their interpretation of what it means to achieve consent. Those projects that had a conscious strategy to achieve CCB validation and

8. Other international instruments, such as the International Covenant on Civil and Political Rights (ICCPR) (1976), the International Covenant on Economic, Social and Cultural Rights (ICESR) (1966), the Convention on the Elimination of all forms of Racial Discrimination (CERD) (1965), do not expressly mention FPIC but their respective committees repeatedly mention the right to culture, the right to equal treatment before the law, the right to self-determination. The 2013 UN-REDD FPIC Guidelines (UN-REDD 2013) cite the UN Special Rapporteur on the 'Right to Food', who quoted the Human Rights Committee to state "no people's land, including in particular indigenous peoples, can have its use changed without prior consultation".

9. See, for example, the formal submission by the Tanzanian Indigenous Pastoralists and Hunter Gatherers Forum to the 12th Session of the UN Permanent Forum on Indigenous Rights.

verification, from the initial stages of the projects, largely demonstrated a process that aimed at documenting the willingness and consent of community members. On the other hand, other NGOs, including WCS who were not aiming to sell verified emissions reductions (and in particular, pursue CCB validation), facilitated community participation with no specific aim of documenting consent.

Another factor that influenced the intention to achieve consent was site selection, where it was much clearer whom the rights holders were in a village land context, than in areas that focused around boundaries of government-protected areas. It was perceived by some project proponents that communities surrounding protected areas were not the rights holders and therefore their consent was not required. This was despite the key benefits of achieving consent in the context of a REDD+ project as outlined earlier.

NGOs other than TFCG/MJUMITA did not include FPIC in their initial design; however they later included it as they understood more about fulfilling the requirements for CCB verification. In addition, several of the NGO project areas had been subject to cases of 'land grabbing' by international investors. Many investments had failed, so in many cases villagers were left off worse than before, and as such, there were high levels of mistrust and scepticism regarding investor projects that were seeking access to village lands. In other pilot projects 'agreement' was discussed around contracts over the sale of carbon, which required signatures from local leaders, and commitments to a 30-year period. This generated considerable levels of dissent in the case of all five MCDI pilot villages, which initially refused to sign the contracts. This resulted in supporting legal advice for villages, renegotiations, changing of terms and conditions, and incorporating the concerns of local parties to the agreement. In the case of JGI, community concerns led to revisions of agreements to include the right to forest utilisation by communities within local forest reserves. Furthermore, although Tanzanian legislation in lands, forest and environment contain many provisions for ensuring community consent, it is often not adhered to. Requirements under REDD+ project validation/verification systems provide new incentives for securing consent with regard to project-supported interventions and thereby supporting the provisions of the legislation.

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In the AWF, MCDI and TFCG/MJUMITA projects, a number of villages chose to withhold consent to participate, based on fears of land or resource 'grabs' and concerns over loss of access to village forests. This meant that other villages had to be identified and the initial process started again in order to reach agreed project targets. Strong opposition from a small number of influential and vocal individuals who were able to sway the opinion or fears of the majority also resulted in significant delays in (or loss of) consent, even when such individuals were known to be those benefiting most from unregulated and often illegal activities (farming operations, illegal logging or other actions that drive deforestation). A key lesson from the projects was the importance of framing FPIC discussions within legitimate and mandated forums, such as the Village Assembly, which is the meeting of all

adult members of a given village and represents the final decision-making body over village affairs at village government level. Extending discussions to sub-village level significantly increased time and costs, but ensured inclusion of remote, more marginalised communities, with generally higher levels of forest dependence.

Despite the higher initial transaction costs, FPIC generated many advantages. Chief among these was managing expectations and mitigating future risks. In sites where FPIC or joint planning and decision-making was conducted, communities appeared to have more realistic and cautious expectations regarding the flow of REDD+ finances. Those who skipped this initial step encountered problems at later stages, when expectations that were initially raised to an unrealistic level failed to materialise. A summary of key lessons on FPIC can be found in Box 2.

Box 2. Summary of key lessons learned from the pilot projects in moving towards FPIC for REDD+

- Having FPIC as part of the CCB standards for REDD+ acted as an incentive to improve the quality of the current practice of 'participatory' project formulation and implementation that is 'inherent' in the Tanzanian governance framework, since demonstrating 'consent' is already required (MCDI, TFCG, AWF and JGI).
- Dealing with rumours and misinformation (AWF, JGI, MCDI and TFCG) could only be dealt with by reaching out to those normally not reached through 'representative' meetings. This required a change in approach and carrying out meetings at the sub-village level that could more directly target all community members.
- The quality of engagement, trust-building, and shared information will influence the consent process and cannot be rushed (CARE, MCDI and AWF). Sub-village and stakeholder focus meetings are critical to this (AWF, MCDI and TFCG).
- Applying the principles of FPIC in designing and approving a REDD+ project has built trust between communities and the project proponent and changes and improvements in the design of the project which may not have arisen without the FPIC requirement (MCDI, TFCG and AWF).
- Information shared needs to be based on facts on both risks and benefits and can be tools to help communities make informed decisions and self-manage their expectations (AWF, MCDI and TFCG).

Summary of key messages

- Although the Tanzanian governance framework requires participation of local people before a project can proceed, this is not necessarily applied through a quality, participatory process that ultimately results in securing or withholding consent. Standards of participation in government processes are weakly regulated or monitored in Tanzania.
- The inclusion of a requirement to respect the right to FPIC as part of the CCB validation for REDD+ appears to have stimulated and incentivised more conscious practice and facilitation of quality participation and community decision making to achieve consent for REDD+ interventions in Tanzania, although initially perceived by many as only relevant to indigenous peoples.
- Pragmatically, it was recognised by most of the pilot project NGOS that engaging local people in project decisions is critical to ensure effective project implementation. Obtaining consent within the context of a REDD+ pilot project generated important benefits, but also resulted in delays and additional up-front costs.
- Pilot projects have experimented over a continuum of approaches and although only one project explicitly included FPIC in its original design, at least three others integrated FPIC practice into their implementation through an adaptive learning process around achieving voluntary standard (both VCS and Plan Vivo).

Measurement, monitoring, reporting and verification

Capacity constraints – and limited national guidance

When the REDD+ pilots started in Tanzania in 2009, there were high hopes that national standards for MRV would be developed and there would be both national and international guidance for NGOs on how to apply remote sensing and MRV methodologies for forest carbon assessment and monitoring. This did not, however, happen and the sharing of lessons between the piloting NGOs has been limited. Given the capacity constraints, a number of projects relied heavily on external expertise in the field of MRV, specifically in the establishment of reference emission levels (RELs), in designing and implementing assessments, and in analysing and reporting forest carbon data. External expertise was particularly needed as in-country MRV capacity was minimal in 2009, and MRV as a discipline was still under development and rapidly evolving. Fast development of ICT and remote sensing technology meant that new opportunities presented themselves, but that elements of trial and error were unavoidable. For example, while skills exist in Tanzania for GIS, these are generally insufficient to undertake complete-area LULC classification and detection of forest cover changes. Lack of experience on monitoring changes on low-carbon miombo woodlands or highly fragmented landscape patterns may result in over-confidence in remote sensing technology for change detection.

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Another challenge faced by many projects was the unavailability of remote sensing data, caused by physical factors, as some coastal or mountainous areas are subject to high levels of cloud cover or haze. In the case of WWF, persistent cloud cover partly prevented flying with light detection and ranging (LiDAR) instruments in the project areas. TFCG and MCDI had to use advanced land observation satellite (ALOS) radar data to compensate the unavailability of optical RS data. In HIMA, the partner organisation Terra Consulting Company developed a new VCS – a *Tool for Calculating LULC Transitions and Deforestation Rates Using Incomplete Remote Sensing Images*¹⁰ (which is currently under validation).

Data collection and analysis protocols

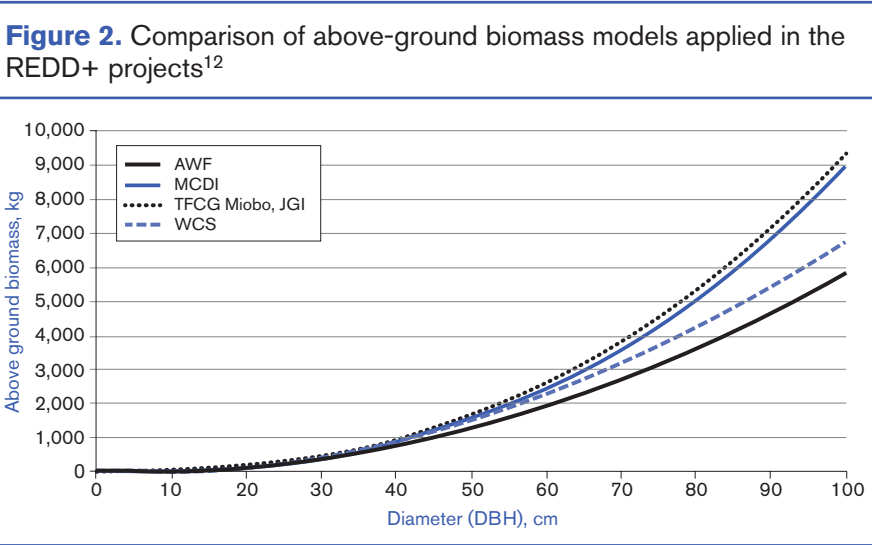
The National Forest Resources Monitoring and Assessment project (NAFORMA) developed and published a national tree species list with species codes, but only one project applied it.¹¹ This was a missed opportunity: data harmonisation is an important issue that the National Carbon Monitoring Centre (NCMC) will have to address. All the REDD+ pilot projects applied different allometric equations in

10. www.v-c-s.org/methodologies/tool-calculating-deforestation-rates-using-incomplete-remote-sensing-images

11. The NAFORMA tree species list was revised in December 2010 and the list has been available since then at www.fao.org/forestry/17847/en/tza/

estimating above-ground biomass (Figure 2). Most above-ground biomass estimates were based on models using diameter at breast height (DBH) as the input was variable and gave quite similar and comparable results, especially for trees with a DBH of less than 50 cm. Interestingly, two REDD+ projects (AWF and WCS) recorded all tree heights in the field sample plots, but in the estimation of biomass and carbon those height measurements were not used, representing another missed opportunity. However, if tree height data becomes essential in the future analysis, old data can be recalculated with newer biomass equations. TFCG/MJUMITA and JGI were able to access NAFORMA field data, and as such TFCG/MJUMITA created a local tree height curve solely using NAFORMA sample tree data. This generated significant savings in time and money as tree heights were not needed in order to assess biomass in the field. An example of synergies that can arise when engaging in data sharing was that the NAFORMA data management team was trained by the TFCG/MJUMITA technical advisor to extract the elevation of the plot centres from digital elevation models using open source software. Consequently plot centre elevation was added as a parameter in the NAFORMA database.

Other projects (beside TFCG/MJUMITA and JGI) were less successful in harmonising data with NAFORMA due to the absence of data-sharing protocols. The Minister of Natural Resources and Tourism committed NAFORMA to free and open data sharing (at least for processed data level) at the presentation of the key findings in May 2013. The lack of data sharing undermined the effectiveness of some projects – particularly the WWF pilot, which focused explicitly on the development of MRV approaches.



12. HIMA used equations with diameter and height, and WWF applied equations with diameter, wood density factors and tree height. These equations cannot be shown in this two-dimensional figure.

Differing forest stratification and sampling arrangements

In general, stratification is important to ensure accuracy of data collected by dividing the project area into sub-populations (strata) that form relatively homogeneous units. If this stratification rule is ignored by, for example, treating both high and low carbon forest types in the same way, the application of the proposed stratification may hinder forest carbon monitoring (as can be seen in the case of the CARE International project). Comparability of forest carbon monitoring approaches can also be a challenge due to different forest classification systems and stratification approaches (for example closed/open forest classes in the AWF project, high/low carbon forest types in the TFCG project, and non-inundated/inundated forest types in the CARE International project). In most cases, the final decision on the applied stratification system was based on targets to separate different land categories in digital satellite images.

There is clearly a need for the harmonisation of forest classification systems to make the maps of all projects comparable and fit for 'nesting' within the national MRV systems. In order to combine REDD+ projects' data onto a national database, a uniform forest classification system and standardised stratification protocol options in MRV should be used. However, different sampling protocols can be allowed. Strict criteria for the best stratification protocol is hard to establish as it can depend on various factors, such as local land cover pattern and vegetation structure, applied monitoring methods and the type of data (as optical satellite, radar, LiDAR, and/or ancillary GIS data), resources and human capacity. Nevertheless, applicable stratification protocols for future REDD+ projects were piloted by AWF (dry acacia and miombo woodlands) and TFCG/MJUMITA (miombo and coastal forests). Both these projects demonstrated successful attempts to classify forest land into more homogenous units based on carbon-stock characteristics.

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Community participation in MRV

In many projects (CARE, AWF, TFCG/MJUMITA and JGI) some individuals in the participating communities were trained in basic forest assessment techniques, such as establishing, locating and measuring sample plots. TFCG/MJUMITA demonstrated an applicable and scalable practice for forest change monitoring by combining remote sensing technology, advanced image classification algorithms and field observations – detected change (to be verified) using RS data was exported from the land information system as point data coordinates that were sent through mobile phone to the village. Consequently, the village team navigated the area with the help of a global positioning system (GPS) to the site of interest to verify the change. The report was then sent through a mobile phone back to TFCG. Similarly, JGI's approach used portable digital data collection technology such as GPS and open data kit (ODK), together with a cloud storage system. This could be applied to a wider scale if a reliable power supply for recharging could be provided and network coverage and internet connections were available.

Field sample plot designs applied by AWF, CARE, JGI, TFCG and WCS proved to be efficient in the field, although difficulties with circular plot types in detecting plot boundary trees correctly were reported by TFCG. On the contrary, JGI found that the concentric plot was the simplest, less labour intensive, more accurate and less time consuming method compared to other plot shapes. Large permanent sample plots (MCDI, WWF) were very useful for capturing very big but rare high-biomass trees and generating sufficient data for RS image analysis, as well as for monitoring forest dynamics (such as growth patterns) but the high cost of such approaches hinders its scalability.

Summary of key messages

- REDD+ pilots have experimented with a variety of approaches to MRV, all of them combining highly technical, remote-sensing approaches with community-based forest carbon monitoring models.
- Due to the dependence on contracted external expertise, challenges with untested technology, the absence of national standards and absence of a body for guiding the MRV and hosting collected carbon data, some REDD+ pilot projects have not achieved their objectives of building a sustainable MRV system and feeding data to national level forest carbon monitoring.
- Piloting of participatory forest carbon monitoring has been successful and Tanzanian REDD+ pilots demonstrated that communities are capable of undertaking complex and technically demanding MRV tasks when sufficient training and incentives are applied.
- The creation of different MRV approaches (and in particular forest stratification and data analysis protocols) has meant that comparison of datasets and results between projects is methodologically challenging.
- Lack of data sharing from the National Forest Resources Monitoring and Assessment project (NAFORMA) on the mainland and the late implementation of Zanzibar Woody Biomass Survey (ZWBS) prevented the projects carrying out comparative studies between datasets.

Getting projects to market

Voluntary carbon markets – the global context

Since REDD+ was launched through the ‘Bali Roadmap’ of the 2007 UNFCCC Conference of Parties (COP) meeting in Bali, there has been significant activity from both conservation NGOs and private sector ‘project developers’ to sell REDD+ forestry offset credits from tropical countries through the voluntary carbon market. By the end of 2012, it was estimated that 513 land use and forestry projects were either operational or being established in 58 countries. Globally, in 2012, 28 tCO₂e of forest carbon was traded, valued at US\$216 million (Peters-Stanley *et al.* 2013). While 24.7 tCO₂e of REDD+ offsets were transacted in 2013 (tripling in volume from 2011), uncertainties over carbon markets globally have resulted in a drop in demand and falling prices (which fell from an average of US\$9.2 to US\$4.8/tCO₂e between 2011 and 2013) (Goldstein and Gonzalez 2014).

In recent years, a range of voluntary designs, methodologies and standards have emerged for crediting REDD+ projects and have been competing with each other for investors and market acceptance (Streck and Costenbader 2012). There has been a gradual convergence and consolidation of these standards and the market is now dominated by the Verified Carbon Standard (VCS), which accounted for 46 per cent of agriculture, forestry and land use projects traded in 2013. Plan Vivo, on the other hand, represented less than 1 per cent of total market share for the same period. Eighty-one per cent of these projects verified the delivery of social and environmental co-benefits under CCB standards. Complexities relating to MRV methodologies and the development of sufficiently robust project design documents (PDDs), coupled with market saturation for voluntary market REDD+ credits, mean that only a low percentage of projects initiated get to market (Linacre *et al.* 2015). Of the 23 REDD+ projects included in CIFORs Global Comparative Study, only four have sold credits to date (Sills *et al.* 2014).

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The realities of selling forest carbon in Tanzania

Of the nine pilot projects that were originally supported by the Norwegian government, only three have produced final PDDs to support the sale of carbon credits (notably CARE Tanzania, TFCG/MJUMITA and AWF), of which a process of validation and verification is either ongoing or completed. Of these, no project has yet managed to sell credits on the voluntary market. This calls into question the implicit assumption that underpinned many of these projects – namely that donor funds provided for project development would be sufficient to bring projects to market and thereby secure sustainability.

Of the nine pilot projects that were originally supported by the Norwegian government, only three have produced final PDDs, notably CARE Tanzania, TFCG/MJUMITA and AWF. An overview of the projects that have produced a PDD is presented below in Table 3.

Table 3. Status of four REDD+ pilot projects with regard to certification

Project	Certification system(s) used	Status as of July 2015
CARE Tanzania	VCS and CCBA	VCS PDDs produced with support from Terra Global Capital (Terra). Validation and verification undertaken by Scientific Certification Systems Inc. (SCS) and comments being processed by Terra and CARE.
TFCG/MJUMITA	VCS and CCBA	PDDs produced, validated and verified (by SCS) for Lindi project site and Verified Carbon Units available for sale. PDD produced for Kilosa and validation expected by mid-2015.
AWF	Plan Vivo	PDDs produced and submitted to Plan Vivo, validated by Edinburgh Carbon Consultants Ltd, comments currently being processed by AWF.
JGI	VCS and CCBA	VCS PDDs produced with support from Scope 14+ Ltd, The Netherlands. Validation and verification process on hold, pending additional fundraising by JGI.

Overall, pilot projects underestimated the complexity, time and cost required to develop sufficiently robust PDDs. In their review of lessons learned, MCDI reported that they were only able to finalise the assessment and prioritisation of deforestation drivers well into the project implementation period (Ball and Makala 2014). AWF initially pursued VCS, as advised by a private consultancy firm based in Nairobi. It later transpired that given the particularities of the site, VCS was in fact unsuitable and the methodology was substituted by Plan Vivo. TFCG/MJUMITA opted to build internal capacity within their own organisations and did not outsource the technical work to an external company. The result was an increase in in-house capacity, but arguably this was done at the expense of long delays in preparation of PDDs. Much has changed between 2009, when these pilot projects began, and now. Certification systems have matured and narrowed down to a few proven approaches, and capacity has been built in NGOs and the private sector regarding the application of these methodologies. Lessons have been learned about managing external partners or service providers working on PDDs and carbon markets. There is a clear need within NGOs to build internal expertise and capacity so that external relationships to service providers can be managed more effectively. Experiences with service providers have been mixed, resulting in poor results and inefficiencies in the case of AWF, and delays in the case of CARE Tanzania. Outsourcing the technical aspects of PDDs does not necessarily reduce workload for the project proponents, as significant amounts of time still need to be invested working with the service providers, collecting information, fielding questions and adjusting strategies accordingly.

At the time of writing this report none of the implementing NGOs have yet sold carbon offsets on the voluntary market. In part, this is due to the delays in getting PDDs validated, verified or registered and the drop in carbon prices over the past five years. The widespread assumption among NGOs was that carbon would sell itself, if it could be certified by an internationally recognised body. This has not proven to be the case – as is shown by the example of TFCG/MJUMITA who have successfully navigated the complexities of VCS/CCBA validation and verification, but have yet to sell any carbon. Lessons emerging from other project developers elsewhere in the market are that potential buyers need to be identified and engaged very early on in the process, rather than being presented with a final product.

Summary of key messages

- Lack of internal capacity, poor service from specialist service providers/partners and high levels of complexity resulted in many projects missing their targets of producing final project design documents by the end of their donor-funded contract periods.
- Complexities of getting carbon to the market have been grossly underestimated by NGO project developers. Falling prices coupled with limited demand in the global carbon market threaten the viability and sustainability of project-based approaches.

Looking back down the road to REDD+

The REDD+ pilots were selected to test a range of different local-level actions that it was hoped would lead to REDD+ readiness and performance-based results. When REDD+ pilot projects were launched in Tanzania back in 2008/09, REDD+ was an untested and poorly understood concept within the Tanzanian (and global) context. National policies and guidelines or standards on REDD+ in Tanzania were non-existent and international guidance was extremely limited. This meant NGOs had to adopt a 'learning-by-doing' approach, which meant higher overall costs and reduced efficiency than if the pilots had been undertaken today. Looking back, we draw a number of overall conclusions:

- Despite the favourable legal and policy environment for decentralised natural resource management that exists in Tanzania, low carbon stocks across Tanzania, complex and interlinked drivers of forest degradation, high operating costs and low carbon prices, coupled with weak demand, mean that REDD+ is unlikely to be a commercially viable venture in the medium term. Significant external investment and support will be required if voluntary market projects are to be sustained from carbon payments alone.
- Drivers of deforestation and degradation are successfully addressed when a range of complementary interventions have been promoted – such as combining participatory land use planning with the promotion of conservation agriculture. Projects have been able to achieve most when they have sought out and built partnerships with organisations with core skills in addressing non-forest topics (such as agriculture, marketing and value chains).
- REDD+ has supported the expansion of PFM to cover an additional 490,000 ha of woodlands and forests across Tanzania. Furthermore, its application to REDD+ has raised important questions about its ability to address landscape-level reductions in forest degradation (by avoiding leakage). Ethical questions remain regarding the way in which REDD+ may distort local management objectives and the risks posed by including large areas of forest within village forest reserves, due to the potential for foregone future opportunities from expanded agriculture and other economic activities. On a more positive note, inclusion of JFM within REDD+ has helped create greater security of tenure and access for forest adjacent communities engaging in collaborative management – by extending agreements over a longer period and ensuring that agreements are signed rapidly. Aggregation of individual parcels of forest within dispersed villages under various 'carbon-co-operative' models has provided useful lessons on how PFM and REDD+ can be taken to scale to achieve efficiency savings.
- Benefit sharing – a subject of much debate both in Tanzania and internationally – has been a major focus of REDD+ pilot projects. Cash payments, made at the individual level within participating communities incur relatively high costs to administer, but present unique opportunities for ensuring benefits are captured at the very lowest levels, triggering widespread awareness and support for

efforts to reduce deforestation and forest degradation. Performance-based (rather than effort, or input-based) payments appear to have triggered the greatest local action and incentives for reducing deforestation.

- The technical challenges associated with developing validated and verified project design documents were grossly underestimated by project implementers, and as a result, the process has taken significantly more time, funding and capacity than originally anticipated. Markets for voluntary market forest carbon offsets, originally assumed to be vibrant and expanding, have stagnated and prices have fallen.
- Lack of national standards for MRV, rapid development of ICT and RS technology, and heavy reliance on external expertise created heavy demands on NGOs implementing pilot projects. Very few pilot projects have succeeded in their objectives of building a sustainable MRV system and feeding data to national level forest carbon monitoring. In the absence of a functional national entity with responsibility for setting standards and methodologies at national level, MRV is likely to be uncoordinated and unsuited to aggregation across projects.

Many fears were being expressed both within Tanzania and internationally regarding REDD+ when the pilot projects were launched. These fears related to grabs, recentralisation of hard-won forest tenure rights and a return to 'fortress conservation'. Our findings do not provide evidence to support these fears, in large part because of the widespread market failures associated with the REDD+ voluntary carbon markets. To date, none of the pilot projects have been able to bring their carbon credits to market, due to falling carbon prices and low demand. The use of FPIC as a tool to support discussions around REDD+ within the context of the TFCG/MJUMITA project around the process of agreeing VLUPs, was an effective approach for negotiating trade-offs over protection versus conversion to other land uses. In other pilot projects, agreements and contracts with participating communities were proposed for a 30-year period (to ensure permanence). These generated considerable levels of dissent in the case of all five MCDI pilot villages, which initially refused to sign the contracts. The process resulted in the provision of legal advice for villages, renegotiations, changing of terms and conditions and incorporating the concerns of local parties into the agreement. In the AWF, MCDI and TFCG/MJUMITA projects, some of villages chose to withhold consent to participate, based on fears of 'land grabs' by external investors (something that happened relatively frequently in certain parts of the country following the biofuel boom between 2005-2009, see for example, Sulle and Nelson 2009) and concerns over involuntary loss of access to village forests. In many cases, these same villagers then applied to rejoin the project when they saw that these fears were unfounded.

Has REDD resulted in a recentralisation of the commons as a means for powerful interests (such as the state) to capture dividends from carbon markets? Again, we think not. In the two cases where JFM was practised, the government felt it appropriate to allocate over 80 per cent of any future carbon revenues to non-state actors and to sign legally binding contracts for a period of 30 years. This

represents a radical divergence from earlier practices, where previous agreements have either gone unsigned or delayed for several years and where benefit-sharing ratios have strongly favoured central or local government. Furthermore, pilot projects demonstrated good progress in supporting communities to claim tenure over land and forests – with the CARE International project on Zanzibar facilitating the registration of 45 CFMAs and the TFCG project supporting the legal establishment of 27 village land forest reserves, (covering an area of over 150,000 ha) and helping 27 villages with the steps needed to gain full legal tenure over their village land area. Overall, therefore, we find that the early promises of REDD+ being a source of sustainable forest financing have failed to materialise, due to market failures and the complexity as well as costs of generating validated and verified PDDs. Funding provided by the Norwegian Embassy in support of REDD+ pilot projects has created a fertile testing ground where new approaches have flourished, raising new policy issues and challenges at the national and international level. It remains to be seen whether these challenges will be taken up and addressed.

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REDD+ hits the ground

Lessons learned from Tanzania's REDD+ pilot projects

In 2009, the Tanzanian government, together with the Embassy of Norway, launched a series of pilot projects with the goal of testing approaches to reducing deforestation and forest degradation (REDD+). These projects experimented with a range of different approaches to protecting forests and reducing carbon emissions, while supporting livelihoods and local economic development. Tanzania's unique legal and institutional framework for decentralised forest management has provided new opportunities to test how communities can be engaged in REDD+, although new challenges have also emerged due to the trade-offs between setting aside forest areas for long-term protection and short-term needs for agricultural expansion.

This paper reviews the experiences and lessons learned from the pilot projects. The technical challenges of establishing robust measurement, monitoring, reporting and verification systems have been a major hurdle. Other challenges have been low carbon stocks and a weakening market for carbon. Some of the emerging opportunities include benefit sharing, which offers a promising model for ensuring continued support for forest protection and improved forest management; and individual payment approaches, which have been found to minimise the risks of elite capture and ensure widespread support for REDD+ across a given community. The inclusion of free, prior and informed consent (FPIC) within project certification schemes has also strengthened engagement between project proponents and participating communities, when compared with more mainstream approaches to community-based natural resource management (CBNRM) in Tanzania.

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