

# Participatory land-use planning for REDD: exploring approaches to avoid leakage and ensure permanence in the context of Angai Village Land Forest Reserve

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## ABSTRACT

Reduced emissions from deforestation and forest degradation in developing countries (REDD) is an emerging international climate policy instrument that comes with considerable challenges and opportunities for forest management across the developing world. While REDD holds tremendous potential for rural, forest-dependent populations, its implementation calls for effective and comprehensive measures towards long-term, integrated land-use planning. In 2009, a three-year participatory action research project was launched to assess the role of participatory forest management in the mitigation of and adaptation to climate change. The project studies the thirteen villages that own and manage Angai Village Land Forest Reserve (AVLFR) in Liwale District, southeastern Tanzania. During the first phase of the project, participatory land-use planning exercises were conducted in three villages to identify the main obstacles to sustainable forest management. This present study describes the participatory methods, techniques and tools applied to identify, score and map current land-use patterns and to assess their implications for REDD and the preservation of vital ecosystem services. While few imminent threats to the forest reserve were found, the absence of coherent land-use plans and the lack of awareness of existing plans significantly constrain the villages' ability to maintain and enhance their forests. Long-term, integrated land-use planning is a prerequisite for REDD in AVLFR, but planning is equally important in addressing other, underlying threats to local livelihoods.

**Keywords:** REDD, participation, land-use planning, climate change

## I. INTRODUCTION

In December 2009, representatives of more than 190 countries attended the 15<sup>th</sup> Conference of Parties to the United Nations Framework Convention on Climate Change (COP 15), charged with drawing the contours of an international climate agreement to succeed the 1997 Kyoto Protocol. While the Copenhagen Summit failed to deliver a binding agreement on global emissions reductions, progress was made towards a mechanism to reduce emissions from deforestation and forest degradation in developing countries and to enhance forest carbon stocks in developing countries (REDD-plus<sup>1</sup>). REDD is designed to reduce the estimated 17.4 per cent of global greenhouse gas emissions caused by forest loss, most of it occurring in tropical developing countries (IPCC 2007, p. 36; FAO 2005). A wide array of actors and initiatives have sought to tackle deforestation and forest degradation for centuries and longer (Adams 2001, McNeill 2000). Yet, REDD entails potential financial incentives of a magnitude unprecedented in the field of forest

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<sup>1</sup> REDD-plus refers to the ensemble of measures to maintain and enhance forest carbon stocks, whereas REDD refers only to tackling deforestation and forest degradation. For the sake of simplicity, this thesis uses the concept of REDD, not REDD-plus, to denote the broad set of aims and techniques by which natural forests in developing countries become incorporated in international climate policies. (see also section 4.3)

conservation (Eliasch 2008). This presents tremendous opportunities for forest-dependent countries and populations across the developing world.

The argument in favour of REDD is compelling, but the challenges ahead are nonetheless daunting. Ever since REDD was introduced in international climate policy negotiations in 2005, scholars of various disciplines have sought to identify and assess the strengths and weaknesses of alternative global architectures for its implementation (Eliasch 2008; Angelsen et al. 2008; Naturvårdsverket 2009). Literature on the mechanism is hence overwhelmingly problem-centred. In order to achieve significant, measurable and verifiable emissions reductions swiftly and at a low cost, REDD has to be designed to ensure permanent results and to avoid the displacement of forest loss (Wunder 2008). Monitoring, verification and reporting systems have to be put in place and the costs and benefits of REDD implementation have to be shared in a transparent and equitable manner (Zahabu 2006a; 2006b; Zahabu and Jambiya 2007; Peskett et al. 2008).

The need for global design options notwithstanding, the international REDD discourse tends to overshadow the fact that REDD, ready or not, has already been introduced to a great number of local communities in developing countries. There is a pressing need to contextualise REDD, the practices by which it is introduced and justified to the people it affects most. Turning to the local challenges associated with the adoption of REDD policies, the present study discusses the role of land-use planning in the context of Angai Village Land Forest Reserve (AVLFR), in Liwale District, southeastern Tanzania.

The purpose of this study is to describe a participatory methodology used to identify, score and map key land uses in Mihumo, Ngunja and Ngongowele villages. The findings are analysed with respect to the role of land-use planning in project-based REDD in general, and in managing leakage and ensuring permanence in particular. The study further discusses the opportunities and limits of participatory approaches in REDD readiness activities. Any conclusion in favour of or against a particular methodology would be premature. The present study therefore undertakes an exploratory task, seeking to identify areas in need of further research and special attention. The study was undertaken in the context of an on-going participatory action research project on the role of participatory forest management in the mitigation of and adaptation to climate change.

This paper sets out with a brief introduction to the concept of REDD with an emphasis on the challenges of leakage and permanence. Section three presents AVLFR, the setting in which the present study was undertaken, introducing in particular the history and current status of the reserve and the institutional arrangements for forest management and governance. Section four discusses the concept of participation in forest management and section five presents the participatory methodology adopted in this study. The final sections present the main findings and discuss their implications.

## II. COUNTERING LEAKAGE AND ENSURING PERMANENCE IN REDD

Forests provide a wide range of vital products and ecosystem services necessary. An estimated 1.6 billion people depend to some degree on forest products for their livelihoods. (Eliasch 2008, pp. 9–10; Innes and Hickey 2006, p.407) In Sub-Saharan Africa, some two thirds of the population resort to forest products for subsistence (Naturvårdsverket 2009, p. 25). Forests also store an estimated 638 gigatonnes (Gt) of carbon, more than the entire atmosphere (FAO 2006, p. 14). According to the Intergovernmental Panel on Climate Change (IPCC), deforestation and forest degradation account for some 17.4 per cent of global annual greenhouse gas (GHG) emissions (2007, p.36). While GHG emissions are global, deforestation is regional, national and local. Between 2000 and 2005, net deforestation occurred in South and Central America, Africa, and South and Southeast Asia. During the same period, forest cover expanded in other regions with East Asia recording a staggering increase of 3,840,000 hectares (CPF 2008, pp. 9–13). The fact that global forest carbon stocks and sinks are in decline has more to do with the quality than with the quantity of forest loss. Tropical forests hold more than half of the global forest carbon stock (ibid; Eliasch 2008, pp. 17–18; 23).

The drivers of deforestation and forest degradation are complex and interconnected. In poor tropical regions, deforestation is driven mainly by conversion of forests into agricultural land, both for small-scale subsistence agriculture and for large-scale commercial plantations. While the role of wood extraction in global forest loss is contested, most agree that it causes forest degradation, but rarely amounts to deforestation. Forest fires, illegal logging, settlement, infrastructure development, and mining are other drivers of deforestation and forest degradation of global significance. Behind such drivers of forest loss there lay indirect causes and structural forces associated with land tenure, forest governance, population growth and migration, as well as international trade in commodities. (CPF 2008, pp. 7–13; McNeill 2000, pp. 228–232)

In 2005, in mainland Tanzania was estimated to have 35.3 million hectares of forests, representing 39.9 per cent of the total land area (Blomley and Iddi 2009). Tanzania suffers from rapid deforestation. The direct drivers of deforestation include land conversion for agriculture, overgrazing, wildfires, charcoal making, reliance on wood fuel, overexploitation of forest products, as well as poor land-use planning and non-adherence to existing plans. The underlying drivers include rapid population growth, poverty, policy and market failures. Deforestation occurs mainly in the 17.3 million hectares of non-reserved forests, but encroachment in forest reserves is nevertheless commonplace due to weak enforcement. From the perspective of REDD, Tanzania displays nearly all the pivotal challenges. (URT 2009, pp. 1–2; Blomley and Iddi 2009, pp. 7–8). Thus, the development and implementation of Tanzania's National REDD strategy has entailed considerable efforts, involving consultations, training, research and knowledge dissemination (Yanda 2009). A National REDD Task Force was appointed in 2008 to oversee the drafting of the Strategy and various pilot projects have been launched to assess the challenges and identify the best practices for REDD implementation.

Of the individual obstacles that arise as REDD is brought into operation, leakage is among the most important. Leakage occurs when the scale of an REDD project is smaller than the full scale of the drivers of deforestation and forest degradation it seeks to tackle (Wunder 2008, pp. 65–66). In order to achieve additional emissions reductions, REDD measures taken in a given area have to be complemented with actions to prevent the displacement of deforestation to other areas. This is why most proposals for an international REDD architecture argue for national rather than project-level accounting and compensation. This would enable implementers to account for leakage within the country, even if a risk of international leakage would still remain. (Wunder 2008; Angelsen et al. 2008; Eliasch 2008)

While leakage refers to the spatial shift of deforestation from one location to another due to improved enforcement of forest laws and other measures, concerns have also been voiced over the possibility of temporal leakage from one period to another. The question here is whether and how the mechanism can adequately ensure that reduced deforestation at one point in time does not simply mean delayed deforestation to another point in time. Any REDD design has to manage the risk that deforestation pressures will recur due to market feedbacks or policy shifts, or that avoided deforestation is offset by natural disasters, such as pests or forest fires. Given that permanence can never be fully ensured, it is important to consider who should be liable for impermanence. (Dutschke and Angelsen 2008, pp.76–77; Angelsen et al. 2008; Eliasch 2008)

Leakage and permanence are often cited risks associated with REDD. Options for a global REDD architecture can be assessed by their ability to tackle leakage and permanence in an effective, efficient and equitable manner. These '3E criteria' refer to the requirements that REDD achieve significant emissions reductions at low cost with an equitable distribution of costs and benefits between stakeholders. (Angelsen and Wertz-Kanounnikoff 2008, pp. 18–20) The following section illustrates why land-use planning ought to be part of any REDD project that deals with leakage and permanence in an effective, efficient and equitable manner.

### III. THE RATIONALE FOR LAND-USE PLANNING IN REDD

There are different and contrasting views as to what land-use planning is, what it should achieve and how it should be conducted. Amler et al. (1999) provide two contrasting conceptions. Land-use planning can refer to the technical task of optimising land-use in a given area, with use of given technology and with respect to a given purpose, e.g. to achieve a maximum output without damage to the long-term productivity of land. But who decides what ought to be produced and for whom? Indeed, a technical perspective fails to consider the inherently political nature of land-use planning. Land-use planning entails decisions about who should be granted the right to use land, for what purpose and on what conditions. From this perspective, land-use planning should “create a social platform for solving problems and settling conflicts” (Amler et al. 1999, p. 4).

The present study argues that integrated land-use planning significantly alleviates the risk of leakage on the local level. Given that people’s livelihoods are safeguarded in an integrated, long-term plan, the incentive to exploit natural resources in an unsustainable manner is reduced. From this perspective, land-use planning is a way of tackling the problem of unclear or ill-enforced land tenure. Where land-users are confident of their right to use the land in the long term, they will have a greater incentive to invest in its sustainable use. (Eliasch 2008, pp. 44–47)

In most parts of Sub-Saharan Africa shifting cultivation is the principle driver of deforestation (FAO 2006; Stern 2006). Shifting cultivation often occurs on a small scale, both for subsistence and commercial purposes. The practice is conditioned by the availability of land, the quality of the soil, agricultural technology and the availability of agricultural inputs. Some of these factors depend on non-local forces, such as national and international commodity markets, legislation, and climate, whereas others can be addressed on the local scale. Arguably REDD combined with integrated land-use planning can address both the local and the nonlocal causes of unsustainable shifting cultivation. Land-use planning is needed to clarify and ensure tenure and use rights where such rights are unclear. This helps mark the boundary between forestry and agriculture, a key prerequisite for project-based carbon accounting, monitoring and compensation. Compensations from avoided deforestation may allow land-users to invest in agricultural inputs or technology improvements. Land-use plans help clarify who should be entitled to such benefits and where land-users may invest safely.

Land-use planning holds somewhat static connotations. In order to be effective, however, a land-use plan ought to provide a framework for change, not a recipe for inertia. One of the most important dynamic forces to be addressed in land-use plans is demography. In a setting where forests are cleared to cater for the needs of a growing population, land-use planning plays a pivotal role in determining how such growth should be managed in order for it to cause least harm to vital ecosystem services, such as forests and water sources. In some cases rapid population growth is accompanied with migration, further adding to the pressure on land. While concerns over population growth are highly relevant in the context of rural and forest-dependent Sub-Saharan Africa, land-use planning cannot be based on simplified understandings of pressure from population on resources (Blakie and Brookfield 1987). On the contrary, land-use planning must be socially and politically informed, taking into account the forces that mediate the impact of population growth on the environment (Jarosz 1996).

Land-use planning helps manage the risk of leakage, but it also plays a role with respect to the permanence of emissions reductions from deforestation and forest degradation. Coupled with effective enforcement, long-term, integrated land-use plans significantly reduce the risk of impermanence. In case REDD is financed through international carbon markets, the importance of credible land-use planning becomes greater still as land-use plans increase the confidence of private sector investors.

The arguments for land-use planning in the context of REDD are intuitive and compelling. Nevertheless, no plan is sufficient by itself and significant investment in institutional capacity, enforcement, awareness raising, and alternative livelihoods have to accompany any successful planning process. Indeed, if plans are prepared without proper consideration of land-use needs and environmental,

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social, economic and political dynamics, land-use planning may even end up doing harm to the stakeholders. On the other hand, an inclusive land-use planning process may well run counter to the vested interests of local elites. The following section moves on to present Angai Village Land Forest Reserve, a setting where the absence of integrated land-use plans present important challenges for REDD readiness activities.

#### IV. THE SETTING: ANGAI VILLAGE LAND FOREST RESERVE

Angai Village Land Forest Reserve (AVLFR) is located in Liwale District, in Lindi Region, in southeastern Tanzania. Established in 2000, AVLFR covers some 139,420 hectares of mainly dry miombo woodland. The reserve is managed jointly by thirteen villages: Nahoro, Nangano, Kibutuka, Kiangara, Kitogoro, Mtawatawa, Mikunya, Liwale B, Likombora, Mihumo, Ngongowe, Ngunja and Lilombe. While rich in valuable timber species, AVLFR has remained largely intact, unlike most forested areas in southeastern Tanzania that were hit by a surge in illegal timber trade from the early 2000's (Milledge et al. 2007). Still, located in one of the poorest regions in the country, the villages managing AVLFR face strong pressures to cash in on their resources at the expense of long-term efforts towards sustainable management. (MNRT 2007; Milledge et al. 2007; Blomley and Iddi 2009)

AVLFR is among the largest continuous VLFRs in Tanzania. The reserve is predominantly dry with some larger perennial and seasonal rivers. The landscape is flat with gentle slopes. Three main vegetation strata have been identified in the forest reserve: dry miombo, wet miombo and riverine forest. The forest is covered mostly by sand soils. Annual rainfall in AVLFR is around 1,000 mm. (MNRT 2007 pp. 9–10) Main timber species include species of *Brachystegia* and *Julbernardia* families. Valuable *Pterocarpus angolensis* and *Dalbergia melanoxylon* are also found, although these have been nearly depleted in parts of the forest (Mustalahti 2007). Located on an important wildlife corridor that connects Selous Game Reserve with the plains of Northern Mozambique, AVLFR is rich in big game (MNRT 2002).

The thirteen villages surrounding AVLFR cover a total area of 479,131 hectares. The villages are located along two main roads, one connecting Liwale Town and Nachingwea in the East and the other leading south to Tunduru. In 2002 the villages had a combined population of 22,843. Nearly the entire workforce is employed in agriculture, both small-scale subsistence agriculture and commercial cultivation. The main food crops are maize, cassava, rice, sorghum, sweet potatoes, cowpeas, and pigeon peas, while the principle commercial crops are cashew nuts and sesame. Other economic activities include metalworking, carpentry, pit sawing, pottery, small business and animal keeping. People benefit from a number of forest products and services, notably firewood, timber, poles, medicinal plants, food, game, fish, and sites of worship. (MNRT 2007, pp. 10–11; Mustalahti 2007, p. 176)

The villages surrounding AVLFR have a long history of interventions aiming to reform land-use and forest management practices. In 1993 Liwale District Council proposed gazetting a large forest area as a Local Authority Forest Reserve (LAFR). The area, now known as Angai Village Land Forest Reserve, was located on unreserved general land and by establishing a LAFR the District Council wanted to tap into the revenue flows associated with trade in high-value timber. In 1994 the District Council approached the Finnish funded Rural Integrated Programme Support (RIPS), requesting its assistance in establishing the reserve. The programme, increasingly geared towards local participation at the time, suggested instead that the surrounding thirteen villages be involved in forest management, providing them greater control over the forest and greater benefits from its use. This set in motion a long series of negotiations and interventions that eventually lead to the establishment in 2000 of a Village Land Forest Reserve (VLFR) to be managed jointly by thirteen villages under the recently formalised arrangement of Community-Based Forest Management (CBFM). (Mustalahti 2007, pp. 172–173)

Development interventions not only made possible the demarcation of AVLFR, external facilitators have also to a large extent shaped the local institutional arrangements for forest governance and management. RIPS facilitated the establishment of Village Natural Resource Committees (VNRC),

charged with managing each village's section of the forest reserve. VNRCs are responsible for patrolling, enforcement of village by-laws, sales of forest products, and raising awareness of forest management within the community. For inter-village coordination, a RIPS-funded workshop resulted in the establishment of MUHIMA (Muungano wa Hifadhi ya Msitu wa Angai), a union designed to coordinate forest management and to oversee cost-benefit sharing between the thirteen villages. (Mustalahti 2007) Alongside village-level actors and MUHIMA, Liwale District Council and the District Natural Resources Office continue to play an important role in facilitating the management of AVLFR. Nevertheless, important institutional challenges remain due to the limited capacity of forest management bodies and the unclear division of rights and responsibilities between villagers and district officials. In such a setting, development agencies are at times more influential than intended.

While unsustainable logging has damaged parts of the forest reserve, AVLFR is by no means under imminent threat of deforestation or forest degradation. The reserve lies some 10 kilometres from the villages and main roads and the general lands surrounding it are forested, catering for the villagers' demand for firewood, timber, poles, as well as medicinal and edible plants. A survey of the forest in Mihumo Village in August 2009 revealed few signs of human activity with the exception of hunting, fishing and beekeeping. Nevertheless, fires, both natural and human-induced, cause major disturbances across AVLFR. Commercial timber trade occurs mainly on forested general land adjacent to villages and main roads. In the villages observed for the present study the volumes of timber trade were modest or inexistent. While land conversion takes place far from AVLFR, the pace of agricultural expansion is rapid and shifting cultivation evidently constitutes the single most important driver of deforestation.

Shifting cultivation is a longstanding feature of the rural economy of southern Tanzania. Evidence of growing climatic stress, however, suggests that the productivity of land is in decline. There are no consistent statistics regarding average temperatures or rainfall patterns in Liwale District or southeastern Tanzania, but eyewitness accounts hold that droughts have become more frequent and increasingly protracted. Many of the once perennial rivers flowing through AVLFR have become seasonal and important water sources have run dry. In a district where the availability of improved water sources is among the lowest in Tanzania, water security has always been a pivotal issue for local livelihoods. In addition to longer dry seasons and reduced agricultural productivity, villagers living around AVLFR complain over the damage caused by wildlife that inhabits the forest reserve.

Climatic stress and wildlife damage are some of the external pressures that render difficult the sustainable management of AVLFR and, indeed, put in doubt the very legitimacy of the VLFR. Hunting and fishing are prohibited, but apparently widespread activities in the forest reserve. Hunting may be a reason for the extensive burning in Angai, but its impact is difficult to assess. A greater challenge is that of encroachment. A group of people mainly from Ngongowele and Ngunja villages have cultivated rice on small plots along Angai River, well within the bounds of the forest reserve. People are well aware that the area is reserved for forestry, but they have refused to leave despite repeated warnings from the VNRC. In a confrontation with the farmers the previous chairman of the committee was assaulted and the matter has now been referred to the police. The ability of local authorities to resolve the encroachment issue is an important indicator of the potential for long-term, sustainable land-use in the villages surrounding AVLFR.

A brief introduction to the social reality of Angai gives an indication of the complexity of natural resources management in a setting where nearly everyone depends directly on a wide array of land-based resources for subsistence. Local and nonlocal forces are simultaneously at play, producing unpredictable outcomes that do not conform to any linear notion of the relationship between population, technology and resources. In a sense, no degree of planning is foolproof in such a setting. Plans will always be contested and external factors may always render them impossible to implement. Yet, land-use planning is necessary if the thirteen villages that own AVLFR are to benefit from REDD finance and such planning is unlikely to succeed unless it reflects the needs and expectations of land-users themselves. The next section discusses briefly the notion of participation in general and its importance for land-use planning in particular.

## V. PARTICIPATION AND ITS LIMITS

Participation figures prominently in Tanzania's National Forest Programme for 2001–2010 and in the recent National Framework for REDD (URT 2009). Both place emphasis on people's right to take part in decisions and processes that affect the resources they depend on. Still, the concept of participation remains helplessly vague, concealing as much as it reveals. (Mikkelsen 1995; Mustalahti 2008; Tacconi 2007)

Participatory forest management (PFM) in Tanzania evolved from the early 1990's. Reflecting the country's longstanding failures in forest governance, PFM was designed to devolve tenure and use rights with associated responsibilities to the communities that live adjacent to forests and depend on their resources and services. PFM was designed to achieve the threefold aims of 1) improved forest condition through more efficient and effective forest management, 2) poverty alleviation through improved local livelihoods and a consistent supply of forest products and services, and 3) strengthened local governance. (Blomley and Ramadhani 2005; 2006; Blomley and Iddi 2009) PFM was officially adopted in Tanzania's National Forest Policy of 1998 and the policy was later codified in the 2002 National Forest Act and a National Forest Programme for 2001–2010 (Blomley and Iddi 2009, 8–11). PFM is an umbrella term that comprises different legal arrangements under which villages and local communities may become involved in forest management and governance. Under Joint Forest Management (JFM) villages or local communities can manage forests jointly with the forest owner, be it the central government or the local government, a private forest owner, or an NGO. Under Community Based Forest Management (CBFM) a Village Land Forest Reserve (VLFR) or a Community Forest Reserve (CFR) is established on unreserved village land. CBFM gives the village or the community the right to manage the forest reserve and to retain up to 100 per cent of the revenue acquired from sales of forest products. (Blomley and Iddi 2009, pp. 13–15)

PFM is by no means a laissez-faire regime, on the contrary. The policy places several conditions on the communities or villages involved. In order for a village, a group of villages, or a community to assume full tenure and use rights over a forest area, this area has to be demarcated and surveyed. Forest management plans have to be prepared and approved by villagers, the local authorities and the Director of Forestry. Village Forest Committees or Village Natural Resource Committees have to be appointed to manage the forest, and village by-laws have to be prepared, providing for rules and sanctions pertaining to forest management and use. The District Council or the Director of Forestry can remove the rights of villagers or community members to manage their forest in case these fail to comply with the management plan. In practice this entails that local authorities and outside facilitating organisations are heavily involved in the establishment of forest reserves under PFM. The policy has been both costly and slow to implement and to date no more than some 4 million ha of forest is placed under some form of PFM. (Blomley and Iddi 2009, p. 19; URT 2009)

There is no conclusive evidence as to the impact of PFM on deforestation and forest degradation in Tanzania, but preliminary findings indicate that the regime has succeeded in improving forest condition to some extent. (Blomley and Iddi 2009, p. 21; Kajembe et al. 2009) Still, Tanzania's National Framework for REDD foresees a rapid proliferation of PFM to enhance efforts to curb deforestation and forest degradation (URT 2009). Against this backdrop, participation in forest management and REDD appears in overwhelmingly instrumental terms. Participation is designed to achieve conservation aims at a low cost. As such, PFM is essentially a form of decentralisation. It is not inherently more equitable than a centralised, top-down regime (Tacconi 2007). A stronger, intrinsic conception of participation would place emphasis on the empowering implications of people's involvement in decision-making and management. Participation, in this view, should not be a means to achieve a given end, but rather an end in itself. (Mikkelsen 1995, Laitinen 2002) By gaining control over their resources people could choose freely between different management options and, in the case of AVLFR, REDD would be one such options.

While participation can be conditioned explicitly by imposed, overarching objectives, such as REDD, participation is in practice always conditioned by a variety of factors. Given the technical requirements of

REDD, is it plausible to expect that a community or a village accepts such an aim and at the same time retains complete control over the affected resources? Clearly people's knowledge of management practices, measurement techniques, carbon markets and planning needs limit their ability to benefit from REDD without significant external facilitation. As novel technologies and rationalities are introduced, participation is necessarily coupled with training and capacity building, and the associated power-relation between the trainer and the trainee. Indeed, this seems at odds with the notion that PFM allows communities to draw on their local or situated knowledge in order to manage their forests in a sustainable manner. REDD, however, is not based on situated, but universal knowledge and hence it appears at least partly beyond the grasp of local knowledge. Does this entail that REDD is somehow fundamentally contrary to the rationale of participation? (Agrawal and Gibson 1999)

Limits of local knowledge notwithstanding, participatory forest management presents very tangible challenges to the equitable implementation of REDD. Scholars of participatory forest management note that in cases where participation is equated with the simple devolution of rights and responsibilities to a local community or village, power and benefits often end up with local elites rather than the most vulnerable groups. This is why many argue for explicit targets with regard to the position of marginal groups within the participating community. In the case of land-use planning such targets appear highly pertinent, as it is rarely the local elites that are forced to make unsustainable or illegal land-use decisions due to a limited availability of productive land. Placing conditions on participation is a difficult balancing act where the interests of marginal groups and individuals have to be weighed against the views and trust of local leaders. (ibid.)

This discussion has attempted to illustrate that participation is an ambiguous concept that does not amount to an approach, a methodology or method in itself. Rather than focus on whether affected people ought to participate, we should ask how participation is best achieved. The following section moves on to present the participatory methods, techniques and tools applied for land-use planning exercises in Mihumo, Ngunja and Ngongowele villages.

## VI. A PARTICIPATORY APPROACH TO IDENTIFY, SCORE AND MAP LAND USE

In conjunction with training in participatory forest carbon monitoring, an exploratory land-use planning exercise was conducted in Mihumo, Ngunja and Ngongowele villages in August 2009. Drawing on the observation that project-based REDD has to be coupled with long-term integrated land-use planning for a reduced risk of leakage and impermanence, these exercises constitute a starting point. While only setting in motion a longer process towards detailed, operational land-use planning, the exercises helped produce important baseline information about current uses of the village lands and their significance for the population as well as the main challenges with respect to the preservation of vital ecosystem services and forest resources.

The participatory land-use planning exercises presented here are based on a vast literature on participation in development cooperation and research. Following some of Chambers' (1992, cited in Mikkelsen 1995, p. 71–72) principles of PRA, the present study sought to achieve a reversal of learning, where knowledge was created, communicated and analysed on site, by and for the participants themselves. In an attempt to offset some of the biases of development research, the exercises were designed to be listening instead of lecturing, relaxed instead of probing, and visual instead of verbal.

Assuming the role of facilitators rather than experts, the researchers' aim was to initiate, but not to control the processes. The facilitators shared information with the participants and let them present and own the outcomes of their work. Although perhaps at the cost of repeatability and comparability, the techniques and tools were elaborated throughout the fieldwork period, through self-critical examination of the facilitators' approaches and behaviour. (Mikkelsen 1995, p. 71–72)

The methods used for these exercises combine investigation and analysis with education and planning. Diagrams and scoring exercises were used to collect data about different land-use activities in the three

villages. Through a mapping exercise the facilitators went on to collect data about the distribution of these activities, while at the same helping the participants create tools for subsequent land-use planning. Throughout the exercises and notably during the discussions, the facilitators also worked to sensitise the participants to key issues and concepts in sustainable natural resources management and REDD. (ibid, pp. 72–73; Laitinen 2002)

The main facilitator of the exercises was familiar to the participants through years of experience as District Forest Officer (DFO). His position contributed to creating an atmosphere of mutual trust and understanding, albeit perhaps at the expense of creativity and openness due to his dual role as facilitator and district official. The lead author accompanied the main facilitator, maintaining a low profile and focusing on recording the conversations and exercises and occasionally assisting individual participants or groups in technical details. Clearly the presence of a Finnish facilitator nevertheless affected the conversations to some extent and the author was frequently mistaken for a donor representative, which is unsurprising given the history of Finnish-funded interventions in the villages. While to some extent distracted by such complicated roles, the facilitators adopted a reflective approach, systematically exchanging ideas and analysis in order to separate subjective inferences from actual observations made during the exercises.

In villages with more than 3,000 inhabitants one cannot assume to involve the ‘village’ or the ‘community’ as a whole. Difficult choices have to be made about who should be invited to take part. For the purposes of the exercises presented here, the facilitators decided to invite representatives of village governments and village natural resources committees (VNRC). Gender balance as well as knowledge of the village land and forest resources were used as key criteria in the selection of participants. These criteria as well as the desired number of participants were presented to the Village Executive Officers (VEO), who were then asked to convene the participants. In Mihumo Village a larger group took part, comprising the village government and the VNRC as well as representatives of the village elders (wazee). Here the number of attendants in the first session was 39. Due to practical difficulties the number was limited to 20 participants in Ngunja and Ngongowele villages. 16 participants were selected among the participants of the first exercises to attend the mapping exercise conducted in a separate session. (Laitinen 2002)

Participatory exercises are often best arranged in central locations, at convenient distance from people’s homes and workplaces. Accessibility contributes to transparency. The exercises undertaken in Mihumo, Ngunja and Ngongowele villages took place in village government offices and local schools. The exercises required a firm surface for drawing and hence rooms with tables were preferred to the outdoors. Working inside buildings also enabled a degree of privacy and peace for the lengthy conversations. Schedules were agreed with village leaders and given that these did not interfere with people’s work, the exercises were held during some four to five hours starting at 10 a.m. (Laitinen 2002)

Once participants were convened the facilitators introduced themselves and the purpose of the exercise. The introductions were developed throughout the three exercises, but each time the connection to ongoing forest carbon monitoring activities was made explicit and the exploratory nature of the activities was stressed. Participants were encouraged to interact and in all three villages the exercises were preceded by questions and answers sessions. This introductory conversation set the tune for the ensuing activities. Indeed, just as much as by use of the techniques described here, relevant information was collected and shared in the discussions that ensued each phase of the exercise.

For the purpose of capturing and ranking the variety of land uses present within the village land and the forest reserve, a simple diagramming technique was applied. The participants were asked to write down or illustrate three land uses or activities on cards and then work in groups to place those cards in a Venn diagram. The land uses that were perceived as most important were placed in a small circle in the centre of a sheet of paper, while less important land uses were placed further from the centre. Finally the participants were asked to group the land uses under more general topics and to add any relevant uses that had been omitted. (Mikkelsen 1995, pp. 136–142; Laitinen 2002)

To further distinguish between different land uses and their purposes the facilitators developed a scoring matrix based on the uses identified in the diagrams and the purposes or criteria mentioned in the ensuing presentations and discussions. Using this scoring matrix the participants were asked to score all the different land uses by purpose, e.g. according to their importance for income. By compiling the results one could then see what land uses were considered most important for a given purpose as well as what purposes a given land use served. As the facilitators later noted, the scoring exercise also helped evaluate the diagrams, since the latter occasionally reflected the hopes and expectations of the participants rather than their immediate concerns. (ibid, pp. 123–128; Laitinen 2002)

Both the diagrams and the scoring matrixes constitute visual outcomes that the villagers can use as support for future decision-making or simply as platforms for discussion. Even when these reflect the views of opinion leaders rather than the majority of participants, the outcomes help people ask pertinent questions about land use and natural resources management.

Building on the uses identified and the scores given in the first exercises, participatory mapping was applied to allow the participants to locate the different activities on the village land. This created a basis for discussing challenges and opportunities of land-use planning. Two different approaches were experimented here. In Mihumo Village the participants were asked to draw maps of the village land in groups, but with each participant drawing his/her home, farm, water source, as well as other key sites and routes. In Ngunja and Ngongowele villages, in contrast, each group was asked to focus on the activities mentioned in the first exercise. This yielded a reliable description of the village land and its various uses as the maps were compiled. (Mikkelsen, pp. 136–142; Laitinen 2002)

While the kind of life mapping explored in Mihumo provided interesting data about how differently villagers perceive their surroundings, the village maps produced in Ngunja and Ngongowele arguably provided a more operational illustration of the specific land-use challenges in the village as a whole. The latter version, hence, is more suitable for planning, but given enough time, elements of life mapping could allow some people to participate more actively, as few villagers seem to be able to map out village boundaries, roads, rivers and other key landmarks.

The purpose of the two-day exercises described in this section was to identify, score, and map the land uses that take place on the village land. Yet, such an exercise is scarcely of value unless complemented with efforts to prepare operational land-use plans that reflect the needs of the land users and the requirements of REDD or the preservation of vital ecosystem services in general. This was made explicit in the concluding conversations with participants and village leaders in Mihumo, Ngunja and Ngongowele, but the decision to pursue planning of this kind is, and should be, a decision that rests with the villagers themselves. The following section presents the main findings of the exercises described above.

## VII. MAIN FINDINGS: LAND USE IN MIHUMO, NGUNJA AND NGONGOWELE VILLAGES

### A. *Mihumo Village*

Following the introduction the participants were asked to mention three activities on cards after which they were divided into seven groups for the diagramming exercise. The groups went on to draw diagrams based on the activities mentioned in the cards. The diagrams were then presented, compiled and discussed (see figure 1). All groups considered agriculture a vital land use. Here many groups differentiated between cash crops and food crops. Whereas cashew was seen as a significant source of income, maize, cassava and rice were mentioned as vital food crops. Vegetable gardening was undertaken for additional income, but as a land use it was seen as peripheral. The great majority of households use firewood for preparing food and hence firewood collection was regarded as vital activity as well.

Poultry husbandry was among the most frequently mentioned activities in Mihumo Village. Poultry constitutes an important source of income for many households and thus a very important activity. As only few villagers own goats, these were considered less important than poultry, while dove husbandry was

regarded marginal. Brick making and timber harvesting were seen as very important activities for construction purposes.

Conservation of forests and water sources emerged as very important land uses as the results were discussed and compiled. Conversely, the collection and extraction of various forest products, such as game, fish and honey, were regarded less important. As for hunting and fishing, the participants were at first reluctant to bring up these activities since they are often conducted illegally within AVLFR. Yet, in the discussion it became evident that these are important sources of additional food, albeit for a limited number of households. Gathering forest fruit and roots, notably mingoko and hangadi, were mentioned, but they were perceived as less important activities as these products are collected by few and only in times of severe food insecurity.

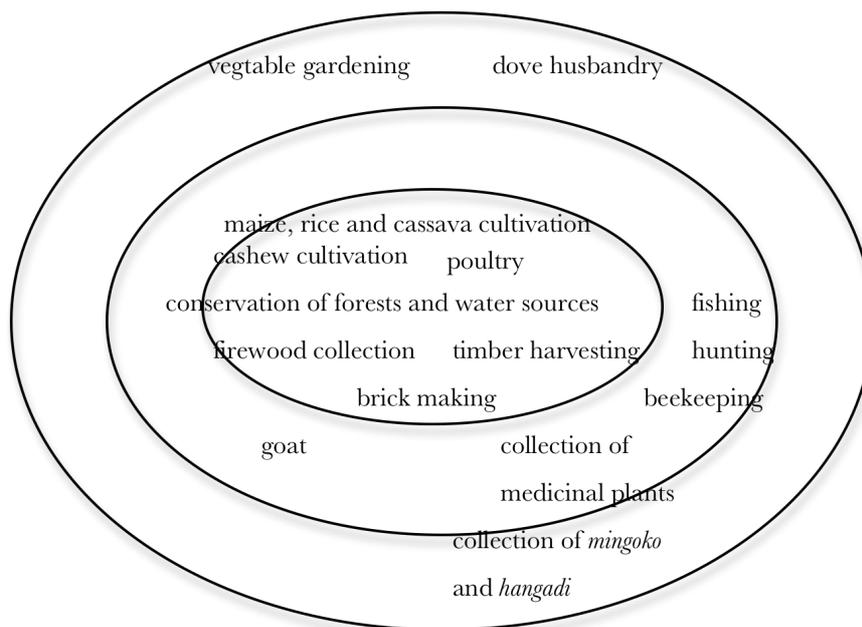


Figure 1. Land-use priorities in Mihumo village

Based on a compilation of the seven diagrams, a scoring matrix with eight activities and four purposes was drawn up (see table 4). Each participant was given five points to score the different activities by purpose. Due to the large number of participants, the scoring exercise was conducted in six groups and the results were then compiled in a single matrix. Some of the results are unreliable due to the slight differences in the matrixes and the lack of clarity regarding the scoring procedure. Yet, the matrix gives some indication of what purposes the different activities serve.

While food crop cultivation and firewood collection form the basis of local food security, cashew cultivation and poultry were seen, among the activities scored, as the main sources of cash income. While some timber is harvested for commercial purposes, most of it is used for local construction needs. Forests and water were considered important especially for health, perhaps in absence of a more suitable purpose, but also since a wide range of commonly used medicinal plants are found in the forests.

TABLE I. LAND-USE PRIORITIES IN MIHUMO VILLAGE

Land use\Purpose	Food	Income	Health	Construction
Cashew cultivation		153	6	
Maize, cassava cultivation	112	5	8	
Timber harvesting		25		90

Forest and water conservation	2	7	90	34
Firewood collection	54			
Poultry		47		
Livestock (goat)		11		
Vegetable gardening		7	6	

Based on the results of the first session a group of sixteen villagers was invited to attend the second session held at the local primary school. The participants were selected based on their specific knowledge of the activities mentioned in the first session. In this second session the participants were divided into four groups and the groups were asked to draw maps over the village land, drawing their homes along with the sites, areas, and routes that are particularly important for their livelihoods. The groups produced four maps with illustrations of houses, farms, water sources; areas used for firewood collection, timber harvesting, collecting medicinal plants, beekeeping, as well as VNRC patrol routes. The main road to Liwale Town, the local primary school, and Mihumo River were used as shared landmarks that helped compile the maps.

The final map (see figure 2) indicates that settlement and agriculture in Mihumo Village are scattered. Although the majority of villagers live near the main road and the village centre, many live closer to their farms and near key water sources, such as Mihumo River. The riverside is also important for vegetable gardening. Most villagers fetch their water and firewood near their homes and their farms. In contrast, timber, game, and beehives are found further from settlements with some hunting and beekeeping undertaken within the forest reserve.

VNRC members, carpenters, and members of the local beekeeping group appeared to know the village area well. Nevertheless, the mapping exercise suggests that only few villagers are familiar with the village boundaries or those of the forest reserve. The fact that Umbabuli, an important cultural site by Angai River, was placed in Mihumo indicates that traditional boundaries are still more familiar to many villagers than those demarcated during the establishment of AVLFR. Umbabuli, officially, is located in neighbouring Likombora Village. The routes drawn on the maps show that most participants move mainly between their farms and their homes, occasionally visiting the village centre.

Discussing the final map we learned that Mihumo Village has established a buffer zone that prohibits agriculture within 1–2 kilometres from the forest reserve. A land-use plan had also been put in place, identifying main agricultural areas. Few participants, however, were aware of the existence of such a plan. It was thus agreed that the results of this exercise are presented to the Village Government for further discussion regarding the development of an integrated land-use plan.

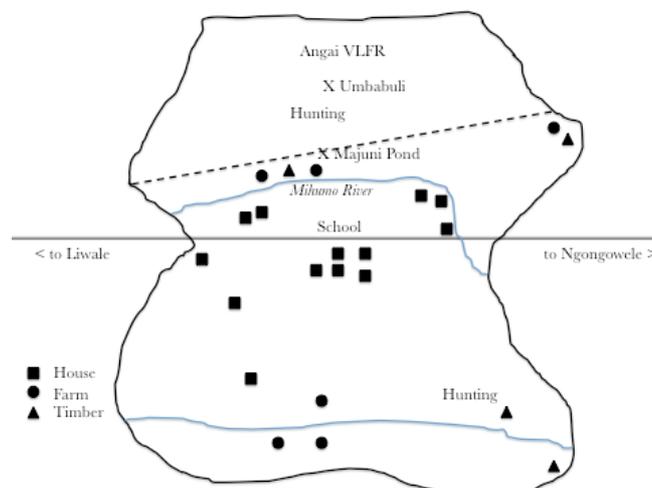


Figure 2. Land-use map over Mihumo Village

## B. Ngunja Village

Informing the attendants of the subsequent training in participatory forest carbon monitoring, an introduction into climate change as well as carbon sequestration and other forest-related ecosystem services was given before the diagramming exercise. The participants were also asked to think of indications of climate change in their surroundings. Many mentioned the depletion of important water sources, notably Ruhuu River. Rainfall was also seen to have declined, aggravating the long-term decrease in agricultural productivity. The prevalence of diseases was said to be increasing, especially malaria.

Following this introduction the diagramming exercise was conducted as described above. Agriculture was regarded as a vital land-use, but cash crops and food crops were not differentiated. Vegetable gardening was seen as an important, but by no means vital source of cash income and food.

Conservation of water sources emerged as another very important activity as the results were discussed. Similarly, forest conservation was considered very important, although not mentioned at first. The forests host sites of worship, but these were considered marginal and declining. Conversely, collection of medicinal plants was regarded a vital activity. Some participants saw medicinal plants and traditional healing as complementary to modern health care, but for some illnesses the former were seen as both safer and more effective.

Settlement and construction were regarded very important, as were timber harvesting and brick making. As forests and valuable timber species are abundant, tree planting was considered a marginal land use, at least for the time being.

Poultry husbandry, goat and beekeeping were considered important activities. However, it appears only few people in Ngunja village own goats. Likewise only a small number of villagers practice beekeeping.

The vast majority of households use firewood for cooking and firewood collection was hence seen as a vital activity. Small amounts of charcoal are sold, but charcoal burning is by no means a significant land use in Ngunja Village.

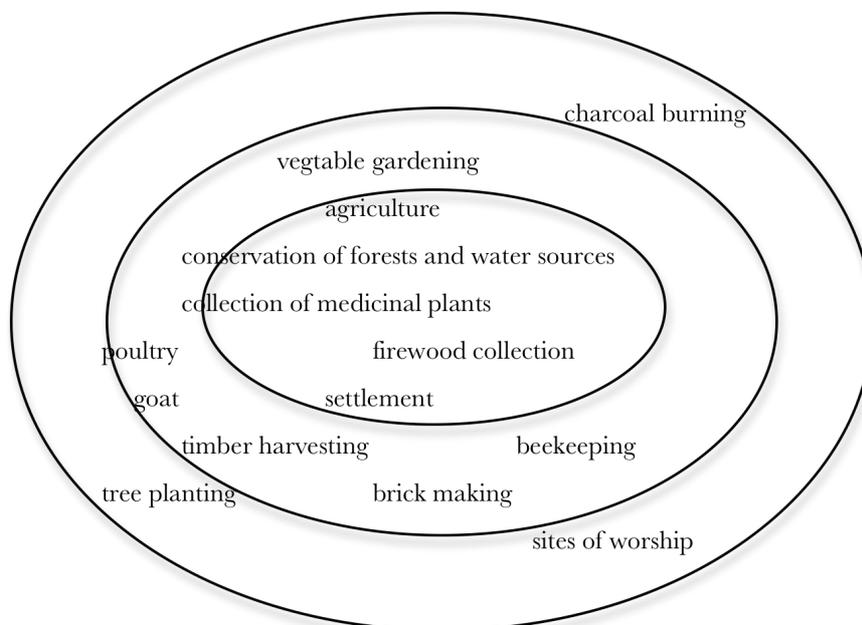


Figure 3. Land-use priorities in Ngunja Village

The scoring exercise was conducted in four groups and the results were then compiled in a single matrix. While almost all activities are undertaken, directly or indirectly, for food, agriculture is by far the most important. Beekeeping, it was discovered, is mainly regarded a source of food, not income. As for

main sources of income, agriculture is the most important land use, followed by poultry and goat husbandry. Water sources and firewood were considered essential for cooking, while timber, poles and bricks are used for construction purposes.

TABLE II. LAND-USE PRIORITIES IN NGUNJA VILLAGE

Land use\Purpose	Food	Income	Cooking	Construction	Healing
Conservation of water sources	12		29		12
Agriculture	123	82		6	
Forest conservation	14			18	53
Traditional medicine	8				135
Firewood collection	10		135		
Poultry		43			
Livestock (goat)		52			
Beekeeping	19	5			
Harvesting of timber and poles		2		101	
Brick making				75	
Vegetable gardening	10	16			
Charcoal burning	4		36		

A group of fifteen villagers took part in the mapping exercise of the second session, held at the village government office. The participants were divided into three groups and the groups were asked to draw the village land, indicating boundaries, main roads and rivers, and proceeding to locate the activities mentioned in the first session. As the maps were presented, participants agreed to use a single map to compile the results and to discuss land-use planning (see figure 4).

The facilitators learned that the village land is divided into two sub-villages and three principal agricultural areas. The two sub-villages have their separate agricultural lands in the north, while people from both cultivate by the rivers in the south. While areas in the north are used mainly for maize and cassava cultivation and cashew is cultivated along the main roads, areas along Ruhuu River in the south are used for rice cultivation and vegetable gardening.

Firewood and medicinal plants are obtained from the agricultural land adjacent to the main settlements, while timber is harvested south of Ruhuu River. This is also where beehives are kept. The river itself is a vital water source and no cultivation is allowed within 60 metres from it. Nevertheless, the participants claimed that this water source was being depleted and some suspected this might be due to agricultural activities in upstream Ngongowele Village.

Wild animals cause major damage to crops across the village land. According to the participants this is because the animals use the village land as a corridor between Selous Game Reserve and AVLFR. A new road is currently being built, connecting Ngunja and Nahoro villages. This road will cross AVLFR and may change current land-use patterns. Ngunja Village, however, had not begun planning for such changes.

Discussing land-use planning the facilitators learned that a plan for the entire village land was developed as the forest reserve was established. This plan divides the village land into settlements, agricultural land, grazing land, and AVLFR. Yet, most participants did not know that such a plan exists nor could they say where these different zones were located on the map. No buffer zone protects the forest reserve and new agricultural land is cleared every year closer to the forest. The participants acknowledged the need of long-term planning in order to maintain the integrity of the reserve and to reduce wildfires.

However, as some argued, without agricultural inputs and education a sustainable land-use would be difficult to implement.

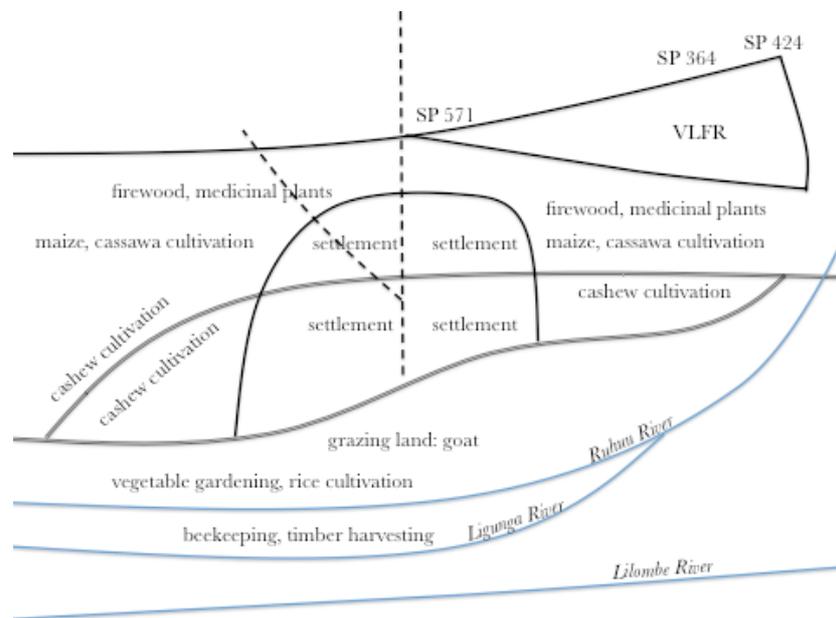


Figure 4. Land-use map over Ngunja Village

### C. Ngongowele Village

The diagramming exercise in Ngongowele Village was conducted in four groups as described above. Perhaps due to the brief introduction the groups drew diagrams based exclusively on the activities mentioned in the cards. Thus, as the diagrams were compiled, a number of activities were added based on the suggestions of the participants and of the facilitators (see figure 5).

A wide range of activities was considered very important. All groups mentioned cultivation of key food crops, such as maize, cassava and rice, as a vital land-use. Conversely, cashew and sesame cultivation were regarded less important. Firewood collection, a prerequisite for preparing food, was also considered very important. In relation to agriculture some groups mentioned irrigation as an important activity, perhaps because an irrigation system for rice cultivation is currently being constructed along Ruhuu River.

Conservation of water sources and digging wells were regarded as vital activities, supporting agriculture and all other activities mentioned. One of the groups also mentioned protection of the environment as a vital activity. However, few villagers could say what this implied in practice. After some discussion environmental protection was divided into the conservation of water sources, forest management, and waste management and sanitation. All of these were placed at the centre of the diagram.

Settlement was considered very important. The participants emphasised the importance of timber harvesting and brick making as land uses that make settlement possible. Also road construction was regarded as very important and a prerequisite for market access and economic development in the village.

Poultry husbandry was regarded a key source of income. Goat keeping was considered important, but not comparable with poultry since very few villagers own goats. A local beekeeping group has been established and some villagers have been trained in modern beekeeping techniques. Still, beekeeping was regarded a marginal land use.

In addition to the uses above the participants mentioned collection of mingoko, traditional pottery, and artisanal mining. One group saw mining as a very important land use, perhaps because of the potentially high returns, but as the question was discussed it appeared that very few villagers practiced mining. Pottery

was seen as a declining practice as most villagers use modern utensils for cooking. Collection of mingoko, finally, was regarded a marginal activity.

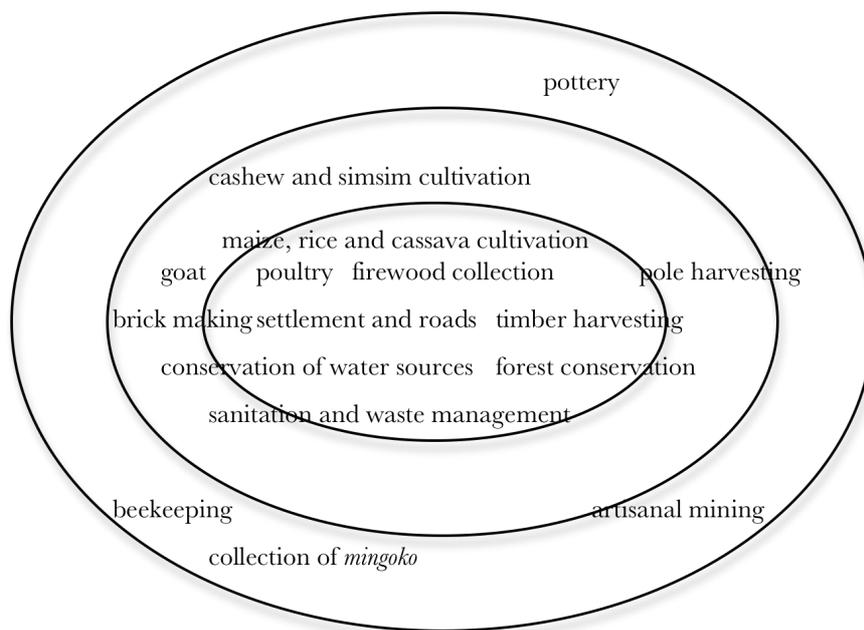


Figure 5. Land-use priorities in Ngongowele Village

For food production, maize, cassava and rice cultivation were by far the most important land uses. For income, although cashew cultivation was regarded most important, points were more equally distributed. It appears most food crops are also used for trade and that poultry is another important source of cash income. Conservation of water sources and sanitation were recognised as particularly important for health.

TABLE III. LAND-USE PRIORITIES IN NGONGOWELE VILLAGE

Land use/Purpose	Food	Income	Cooking	Construction	Health
Cashew cultivation	11	57	6	30	10
Maize, rice and cassava cultivation	61	39	0	24	18
Well digging and conservation of water sources	31	14	62	30	48
Forest conservation	21	20	49	24	18
Sanitation and waste management	7	2	13	5	65
Harvesting of timber and poles	0	17	0	32	0
Firewood collection	22	7	56	8	0
Brick making	0	3	0	32	11
Poultry	19	23	2	2	14
Livestock (goat)	18	8	2	3	6

Sixteen people took part in the mapping exercise. Divided into three groups the participants were instructed to draw a map of the village land, including boundaries, main roads and rivers, settlements, and the VLFR. Perhaps thanks to the more precise instructions it was easy to compile and compare the maps (see figure 6).

The facilitators discovered that the village land is divided into four sub-villages and three main agricultural areas, with maize, cassava, sorghum and cashew cultivated in the north and along the main

road, and rice cultivation and vegetable gardening concentrated along Ruhuu and Ruchemo rivers in the south. This is also where the new irrigation system is being built.

Timber is harvested mainly in three different areas, with some valuable *Pterocarpus angolensis* obtained in areas bordering the forest reserve in the east. More species of valuable timber, however, are found further from the settlements, north of Angai River and south of Ruhuu River.

The local beekeeping group operates in the north, along Angai River. Bricks are manufactured near settlements, whereas pottery is concentrated along Ruhuu River. Firewood is collected in the agricultural zones, near settlements and roads. Artisanal mining is concentrated to the area between Ruhuu and Ruchemo rivers.

Water sources were discussed at some length during the mapping exercise. While there is a functioning water pump in Lighula sub-village in the northwest, villagers from the southern sub-villages fetch their water from traditional waterholes dug into the Ruhuu River bed. Some water is also collected from Angai River, near the road to Liwale Town. Two ponds are located near Angai River, but one of them was dry this time of year, whereas the other was very far from settlements. In the discussion it became clear that as the once perennial Ruhuu and Angai rivers have become seasonal, water shortages are a major cause of distress in Ngongowele Village.

Discussing the forest reserve the participants touched upon the issue of illegal rice cultivation within the reserve, along Angai River. Land was perceived as scarce in areas bordering east of the main road and illegal cultivation was seen as a matter of necessity. So far few efforts had been made to offer alternatives to the people cultivating within the forest reserve, despite the fact there is plenty of arable land north of Angai River and south of Ruhuu River. The facilitators also learned that no buffer zone had been established to protect the forest reserve nor had the boundary separating the forest from the open area been demarcated. The participants conceded that they did not know exactly where the boundaries are and they agreed to discuss demarcating the boundary in the near future.

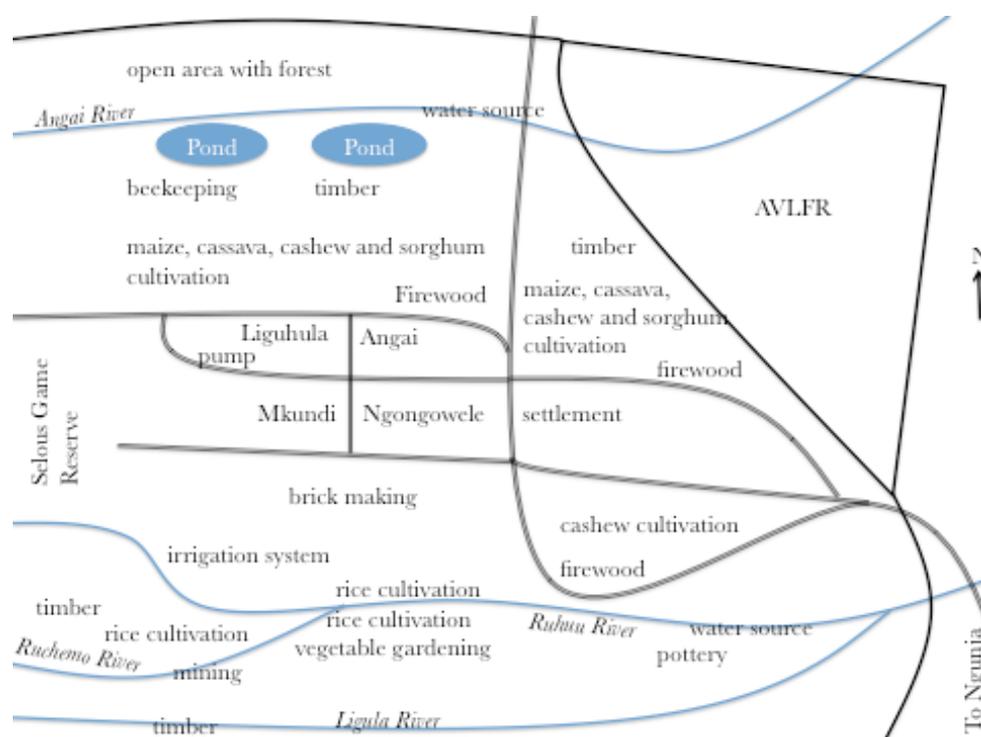


Figure 6. Land-use map over Ngongowele Village

## VIII. DISCUSSION

This study argues that long-term, integrated land-use planning not only helps counter leakage and ensure permanence in project-based REDD, land-use planning serves a number other purposes in communities where an overwhelming majority depends directly on natural resources for subsistence.

The outcomes produced and the discussions held in Mihumo, Ngunja and Ngongowele villages give an indication of the challenges people face in managing their land and their resources. Clearly all villages face a conflict between immediate and long-term needs. Whereas agriculture for food and income was considered vital in all villages, shifting cultivation constitutes the greatest threat to the sustainable management of forests and water sources. Developing means for the people to satisfy their immediate needs without disrupting the ecosystem services that enable them to do so is a challenge that requires planning, but also resources for the implementation and enforcement of plans.

In addition to ecosystem services, forests produce a number of important goods. It seems most of these goods are collected and used for subsistence rather than markets. Indeed, most villagers have very little experience of trade in forest products. Initiatives to introduce REDD face the challenge of preserving and enhancing forest carbon stocks without denying local populations access to the manifold forest products and services they depend on. Moreover, REDD measures have to take into account the fact that, in accordance with the legal framework for PFM, as forest management plans are finalised, villagers will seek to cash in on the high-value timber resources they own.

Illegal land use, especially poaching, takes place in all three villages. At the moment the villages are unable or unwilling to effectively enforce the bylaws that protect the forest reserve. Agriculture within the forest reserve in Ngongowele Village is a case in point. Due to insufficient enforcement of village bylaws the village land and the forest reserve resemble an open access where first-mover advantage prevails. Comprehensive, integrated land-use planning can help people in Mihumo, Ngunja and Ngongowele alleviate this tragedy of the commons without disenfranchising the people from the use rights they depend on. Land-use plans are scarcely of use unless they are implemented and enforced. Implementation and enforcement require resources, skills and commitment. There is a difficult balancing act between external support and facilitation on the one hand, and local participation and commitment on the other. Whether people in Mihumo, Ngunja and Ngongowele will strike the right balance depends on the ability of village leaders to engage villagers in the planning process as well as on the availability of skilled facilitators to take the process to the next level.

The participatory methods, techniques applied in this study aimed at identifying, ranking, scoring and mapping land use on village lands and in AVLFR. The methodology was designed to provide important baseline information about current land use and associated challenges from the perspective of REDD and the conservation of vital ecosystem services. Moreover, the approach sought to create a platform for debate, where villagers could express their views and resolve disputes. This exploratory study reveals that the methodology still has important limitations.

Firstly, although the outcomes were produced and approved by the participants themselves, simple maps, tables and diagrams can never accurately convey the complexities inherent in such exercises. Indeed, as the very design of the exercise was to produce a single outcome to represent the reality as understood by the participants, consensus was sought at the expense of diversity. The facilitators worked to allow all participants to get their voices heard in the discussions and during the exercises, but undoubtedly some were able to participate more fully than others.

Secondly, the participants did not attend the sessions devoid of expectations. Clearly there were several indications of how their expectations towards the facilitators shaped their behaviour. Similarly, the facilitators conducted the exercises with the difficult double role of facilitating an open exchange of views while at the same time introducing ideas and concepts that shaped those views. Nevertheless, openly

sharing the purpose of the exercises and introducing the participants to the key concepts was regarded a primary responsibility.

Thirdly, as the exercises were designed to identify current land-use activities challenges pertaining to these, potential and perhaps fundamental changes in those activities were not properly addressed. Dynamic forces have to be taken into account in order for plans to be sustainable. Yet, addressing such forces may call for land users to transform current practices, even in ways that lay beyond reach of local knowledge. How to introduce such reforms in a way that does not violate the principles of participation remains a tremendous challenge.

Given these limitations it is evident that the methodology described here requires considerable elaboration. The techniques should be even more visual, making the outcomes more accessible to other community members and more amenable to further consideration. Given enough time, the exercises could be combined with transit walks with key informants to see the activities and places discussed. This would support participants in mapping their surroundings and interpreting the maps they produce. Moreover, GIS data is needed to verify and support the outcomes of participatory land-use planning exercises, not least to make those outcomes amenable for public decision-making on the district, regional and national levels. Finally, as the exercises are concluded the facilitators should be able to propose clear next steps to help the participants and village leaders follow up on the processes they have initiated. Still, all such next steps should primarily be proposed and always decided by the participants themselves.

Land-use planning is a continuous process. The exercises described in this paper can be seen as an attempt to convince and help people to engage in that process. Much is still needed, however, to make this engagement an enduring one. There is a growing need for assessing the strengths and weaknesses of options for a global REDD architecture. The present study, however, has sought to explore the practical challenges that arise as REDD is introduced through various readiness measures. Angai and the surrounding villages have a long history of interventions aiming to improve land use and forest management practices. Still, most villagers appear to be unaware of the plans prepared to date. Clearly land-use planning in itself as well as REDD is insufficient unless information is shared and unless decisions are made in an inclusive manner. The exercises conducted in Mihumo, Ngunja and Ngongowele villages are an attempt at taking note of past failures and launching a more transparent process of integrated long-term land-use planning.

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