Forest Reform in Tanzania: A Review of Policy and Legislation.

Razack B Lokina[32]

Abstract

Community participation in forest management has existed in the United Republic of Tanzania for a long time, but on a small scale. It is common to find trees of certain species are being protected and managed for traditional reasons. It has been observed that forests and woodlands that are managed using traditional knowledge and practices are accorded high respect by concerned communities. Thus, fires or encroachment does not affect them. While the strategy of setting aside forests and woodlands for protection remains the centerpiece of management of these resources in the United Republic of Tanzania, this has been the result of evolutionary process from a conventional to a participatory approach of forest management. In this regards, Tanzania has been considered among successful countries in African in implementing Participatory Forest Management (PFM) as promoted through both Community-Based Forest Management (CBFM) and Joint Forest Management (JFM). Policy provisions and legal framework has been important stepping stones for involvement of different players in forest conservation. In addition, legal reforms have tried to invert the colonial approach that excluded local communities from management and ownership of most resources in their vicinity. PFM typically has been implemented on a forest-by-forest or village-by-village basis, rather than using a landscape approach. But protecting one forest through PFM may displace villagers' Non Timber Forest Product (NTFP) harvest into other less protected forests, possibly causing greater ecological damage. A landscape approach to PFM would take into account even those forests that are not used by villagers before PFM is introduced but that might be once PFM reduces or eliminates access to alternative forests.

Keywords: Participatory Forest Management, Policies, legislation, Forest, degradation, deforestation

[32] Senior Lecturer, Department of Economics, University of Dar es Salaam, Department of Economics; Box 35045; Dar es salaam, Tanzania, Tel: +255 222410252: Fax +255 222410162; Email: rlokina@udsm.ac.tz

1.0 Background

Approximately one third of Tanzania's forested area is reserved in the form of Central Government Forest Reserves (CGFRs) under the jurisdiction of the Forestry and Beekeeping Division (FBD) or Local Government Forest Reserves (LGFRs) under the jurisdiction of District Forestry Officers (Wily & Dewees 2001). The forest resources in these reserves have been exposed to uncontrolled extraction activities because governments have lacked the capacity to properly enforce the rules governing extraction (Wily 1998). The other two thirds of the forested area not formally gazetted as forest reserves and are situated on areas of general or village land and is *de facto* an open access resource (Wily & Dewees 2001). Devolving management authority over forest resources to villages or other local communities, as in Participatory Forest Management (PFM), is recognised as a means to arrest deforestation or forest degradation occurring because of open access problems (Lindsay 1999, Matakala & Kwesinga 2001, MNRT 1998, Petersen & Sandhövel 2001, Wily & Dewees 2001; Robinson and Lokina, 2011). This has also become an officially declared goal of the Government of Tanzania (GoT) in the new National Forest Policy of 1998 and the recently approved relatively New Forest Act of 2002 (MNRT 1998, URT 2002). In Tanzania, villages or other local communities can obtain lease rights over CGFRs and LGFRs through Joint Forest Management or create their own forest reserves out of general or village land through Community Based Forest Management (CBFM).

Therefore the specific characteristics of common property resources (CPRs) will be presented along with alternative ways of managing CPRs with special emphasis on the collective management regime, the principles of which are applied in PFM. Secondly the theories on collective management of CPRs developed by Oakerson (1992) and Ostrom (1990; 1999) are presented, as these theories form a basis for the analysis of the PFM implementation. Then a behavioural approach to collective action by Ostrom (1998) is presented, as this lays the foundation for a more careful study of the mutual interaction of the actors in the PFM implementation process. Finally, the three theoretical approaches are synthesised and the application of them in relation to PFM is briefly discussed.

2.0 Characteristics of Common Pool Resources

For the purpose of this review paper CPRs are defined as renewable resource systems from which (1) extraction reduces the amount of resources available to others and (2) exclusion is very difficult or costly. These characteristics are denominated rivalry and excludability in economic terms, and in these terms CPRs are defined as showing rivalry in consumption, but only low degrees of excludability (Gravelle & Rees 1992, Hanley *et al.* 1997, Ostrom 1990). Excludability is concerned with the possibility of excluding others from benefiting from the good, while rivalry relates to whether the consumption of one person reduces the amount available to others (Gravelle & Rees 1992, Varian 1992). Figure 1 illustrates how the distinction between goods may be done according to the properties of rivalry and excludability.

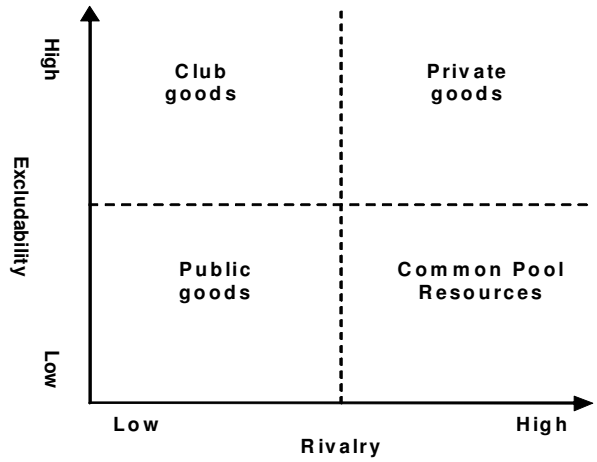

Figure 1: Designation of goods/services

Imperfect excludability often occurs when effective control of a good is conferred on a group of individuals rather than a single individual or when a good has such physical characteristics that exclusion is either very difficult or very costly. Goods or assets with this characteristic are described variously as *non-exclusive*, *free access, common-property resources or common pool resources* (Gravelle & Rees 1992, Varian 1992).

Forests are renewable natural resources as they are self-regenerating and continue to produce extractable resources if not depleted below a certain critical stock level below which their regenerating capacity is seriously affected[33] (Neher 1990, Pearce & Turner 1990, Turner *et al.* 1994; Perman et al 1999). Thus, the amount of resources that can be extracted from forests without exhausting the resource is finite, implying that extraction is subject to rivalry. Furthermore, natural forests often suffer the consequences of imperfect excludability because their size and other physical attributes make exclusion very costly. This situation is especially valid in less developed countries (LDCs) where forests tend to be subject to poor enforcement of and/or confusion regarding tenure rights (Angelsen 1999, Angelsen & Kaimowitz 1999, Ostrom 1990, Petersen & Sandhövel 2001, Tyynelä 2002). From the defining characteristics shown in figure 2.1 it is clear that such forests are goods or assets in the CPR category.

3.0 Problems related to CPRs

Resources with CPR characteristics are threatened by overuse when the sum of the individual rational users behaviour produces an outcome that is sub-optimal for all users as a group and the concerned parties cannot agree on how to solve the problem. This sub-optimal outcome occurs when (1) users perceive their individual benefits from extraction to be higher than their share of

[33] If a forest is depleted below its critical stock level it may suffer grass invasion or desertification, providing long-term damage to its productive functions (Frost 1996).

the resource degradation cost that is shared among all users and (2) the costs[34] of cooperating are higher than the perceived additional benefits (Gravelle & Rees 1992, Hanley *et al.* 1997, North 1990, Pearce & Turner 1990, Pretty & Ward 2001, Turner *et al.* 1994, Varian 1992).

When overuse results from non-exclusion the market has failed to signal the true scarcity of the resource (Hanley *et al.* 1997). In such situations every individual is inclined to capture as many of the benefits from the CPR as possible before someone else does. Game-theoretic models as 'The prisoners' dilemma' assuming rational behaviour by agents have been used to show that non-cooperating users of a CPR are likely to produce a Pareto-inferior outcome as a Nash Equilibrium[35]. In the words of Ostrom (1998) these CPR problems are social dilemmas, where "Social dilemmas occur whenever individuals in interdependent situations face choices in which the maximization of short-term self-interest yields outcomes leaving all participants worse off than feasible alternatives" (Ostrom 1998:1). This definition by Ostrom also embraces the famous game-theoretic models 'The tragedy of the commons' and the 'The prisoners' dilemma'.

4.0 Solutions to CPR dilemmas

Traditionally, solutions to CPR dilemmas have been sought primarily in neoclassical theory assuming that agents behave rationally and stipulating that the market is the only means to ensure an efficient outcome. Within this line of thinking the solutions to CPR dilemmas are either policy interventions or privatization both intended to correct the market failures that prevent efficient resource allocation. These solutions are based on the assumption that rational individuals are trapped in CPR dilemmas from which they cannot extract themselves without external inducements or sanctions (Hardin 1968, Pretty & Ward 2001). External intervention in the form of a government taking over management responsibilities, however, has the shortcoming that government officials may lack both the knowledge to device optimal rules and the power to enforce these rules (Petersen & Sandhövel 2001, Pretty & Ward 2001). In situations where ownership is vested with authorities that are external to the user-community and have only few resources for enforcement, and where the rules governing appropriation are not well suited to local conditions, those rules are likely to be abandoned by users pursuing the strategy that produces the sub-optimal outcomes (Pretty & Ward 2001, Ostrom 1990; 1999). An alternative to external intervention is collective management by local communities, which has been suggested as a solution to CPR dilemmas (Ostrom 1990). When rational individuals behave according to the game-theoretic trigger-strategy it results in the optimal outcome for the community as a whole[36].

---

[34] These costs include transaction costs, which can be defined as the costs of designing and enforcing collective management rules associated with the cooperative strategy. Other costs in relation to the cooperative strategy may be due to changes in management practices, e.g. Reduced-Impact Logging.

[35] In Nash Equilibrium no one is motivated to change their choice given the choices made by others. Many game-theoretical models assuming individual rationality has a Pareto-inferior outcome as their solution as e.g. 'The tragedy of the commons' and the 'The prisoners' dilemma'. Pareto inferiority is characterized by an outcome where at least one alternative outcome exists that is strictly preferred by one individual and is as least as good for all others, while Pareto superiority/optimality is where no such alternative exists (Varian 1992).

[36] When the dominant strategy of individuals is to choose the non-cooperative strategy (yielding the Pareto-inferior outcome) in perpetuity as the response to other individuals' non-cooperative behaviour in one period this is called the trigger-strategy (Gravelle & Rees 1992, Varian 1992).

In collective management of a CPR a mutual bargaining among the users of the resource must occur in order to achieve the Pareto-superior outcome. This implies that users comply with a collective strategy of restricted individual use of the resource in the interest of its long-term sustainable use for the community as a whole (Pearce & Turner 1990). Hence, the collective strategy for the management of a CPR determines who shall use it, in what circumstances, for what length of time and under what terms (Gravelle & Rees 1992).

In the words of Ostrom (1998) users can solve first-order social dilemmas, which are the dilemmas facing the users of a CPR leading to overuse, only through first solving the second-order social dilemmas of providing the rules governing collective management and enforcement of these rules. Solving such second-order social dilemmas is difficult, as the people taking the responsibility thereby are providing a public good.

The importance of the participatory forest management (PFM) process in Tanzania is underlined by the fact that around 90 percent of the country's energy consumption is supplied by woodfuel. This makes Tanzania one of the countries (number 8 of 170 countries) in the world most dependent on woodfuel for energy purposes (World Bank 2002). One of the consequences of this dependency is that the forest resource has been depleted in many areas as a direct consequence of the demand for woodfuel (Hofstad 1997, Ishengoma & Ngaga 2000, Monela *et al.* 2000). Furthermore, Tanzania is one of the poorest countries in the world. On the latest Human Development Index (HDI) from the United Nations Development Program (UNDP) Tanzania is placed as number 152 of 185 countries in the survey (UNDP 2013). As the importance of forest management in relation to rural poverty alleviation has been accentuated by numerous researchers (Cavendish 1998; 1999; 2000, Luoga *et al.* 2000, Monela *et al.* 2000,), it seems obvious that PFM if appropriately implemented can play a significant role in alleviating poverty problem in the country. In other words, PFM potentially has a very large role to play in both the conservation and developmental perspective of forested areas in Tanzania.

Thus, PFM in many low-income countries has been introduced to protect forests from over-exploitation whilst ensuring those nearby forest-dependent households' livelihoods are not harmed by reduced access to forest resources. Despite these however, it has remained a problem as in most forests, nearby communities that have in the past relied on the forests have lost access to important forest resources and have little incentive to stop more distant individuals and groups from degrading the forests. Forest officials have the incentive, but lack funds and appropriate enforcement strategies to protect the forests. As a consequence, nearby communities has not extracted the maximum benefits from PFM contrary to their expectation, and worse still in some places their relationship with the forest officers has not improved.

Decentralized forest management was introduced in Tanzania to correct poor incentives for local communities to protect forests and trees (URT, 1998). Under the 1959 Forest Ordinance, local communities had no official rights to adjacent forest resources or trees on farmland and central government could issue harvesting licenses without consulting or informing the affected communities. The resulting poor incentives for local communities to protect forest and tree

resources is thought to have played a significant role in the degradation of forest in Tanzania (Petersen and Sandhövel, 2001; Wily and Dewees, 2001).

Over the past thirty years, a series of policies have aimed to address rural people's dependence on forest resources while protecting those forests from further deforestation and degradation. Social forestry projects, integrated conservation-development projects (ICDPs); participatory forest management (PFM), encompassing joint forest management (JFM) and community-based forest management (CBFM); ecotourism; and payment for environmental services (PES); Reduced Emission through deforestation and Degradation (REDD); Clean Development Mechanism (CDM), all aim to involve villagers in the protection of local forests and to enable villagers to capture some value from the protected forests. Individual projects and policies have been deemed successful when the local communities have received benefits. However, the distributional effects of these projects have tended not to be addressed explicitly, and the connection to maintained or increased forest protection, or avoided degradation, particularly at a landscape level, has proven elusive.

In mid-1990s there was an increased realization of insufficient central government's capacity (both financial and human resources) to manage both reserved and non-reserved forests necessitated the need for a new approach that will secure local communities' support (Dewees 2001; Wily and Dewees 2001; Blomley and Ramadhani, 2006). This implied a decentralization of forest management rights to local communities through a strategy called Participatory Forest Management (PFM), which implies both community management as well as co-management approaches (Community-Based Forest Management and Joint Forest Management). Reasons behind such decentralization of forest resources management include: the potential for cost-effective local management of forests; relevance of local knowledge of ecological dynamics to proper management; increased motivation for local community to conserve forests following recognition of their critical role in the management, eventual increase in tangible benefits from the forest (economic incentives) and sense of ownership regained over their forest resources (empowerment) (See Kajembe and Kessy 2000).

The transfer of forest ownership and management responsibility from central to village government/community started through limited number of experiments in northern and western Tanzania (Wily 1997). It was on the basis of the lessons learnt and challenges encountered that were important for improving modalities to scale up PFM activities. In order to formalize the decentralization of forest resource management rights, this experimental activities went hand in hand with the review of policies and legislation related to forestry sector in the late 1990s (Blomley and Ramadhani 2006, URT, 2006).

Important legal reforms that created enabling environment for participation of local communities in management of land and forest resources included; the development of the National Land Policy (URT, 1995), approval of National Forestry Policy (1998), formulation of the Land Act (1999) and Village Land Act (1999), enactment of the Forest Act (2002) and Forest Regulations (2004) as well as development of Participatory Forest Management Guidelines in Mainland Tanzania. In this paper attempt is made to review key policies related to forest and how the

policy has been instrumental towards the successfully implementation of the management approach and showing how these forest reforms confirm to the principals as stipulated by Ostroms and others.

5.0 National Land Policy (1995)

Land reform was an important policy issues that advocated land tenure issues by providing clear distinction between land that falls under the authority of central government and that under the authority of village governments. The policies, among other things address the need for governing/secure land tenure system, land use management and administration. Such reforms were a need since Tanzania attained political independence in 1961. Under the land that falls in the village government, the village councils are charged with the role of managing the village communal land, including forests and woodlands within their respective village boundaries. This reform was an important stage towards decentralization of land management rights through involvement of the local communities.

6.0 National Forestry Policy (1998)

The goal of the policy is to have "an integrated forest sector that achieves sustainable increases in the economic, social and environmental benefits from forests and tress by all the people of Tanzania, especially the poor and vulnerable". To ensure efficiency in forest management and conservation either for production and/or protection, the policy statements recognize the need for broad-stakeholders engagement though it does not define PFM as such. Under the forestry policy, engagement of local communities falls under two major options; through the establishment of Village Land Forest Reserves (VLFRs), where communities becomes managers and owners of forests within their village boundaries or through co-manager of forests under central and local government authorities-National Forest Reserves (NFRs) or Local Authority Forest Reserves (LAFRs). Additional important statements that the policy point out are those that address conservation of forest biodiversity, on watershed management and soil conservation and supply of trees seeds and planting stock. The policy further notes an increasing concern about the deteriorating state of forestry in the country. It acknowledges that the natural forest cover is receding; ecological services are declining; and that there is increasing pressure on forest land and increasing demand on forest products. It further acknowledges that management capacity is limited and institutional weaknesses constrain development of the forest sector. In its guiding principles, the policy calls for diversity and environment services to safeguard the nation's forest biodiversity and environmental services through effective conservation strategies and calls for sustainable management of Tanzania's forests. Beyond the formal forest reserve network, the policy considers the role of surrounding communities/village councils a rational way to rescue forest resources from unsustainable uses, however through clear legal mandates.

7.0 Land Act (1999) and Village Land Act (1999)

To provide for instruments to implement the National Land Policy (1995), Tanzania enacted two land acts in 1999; the Land Act and the Village Land Act. The two Acts have important implications on forest management in relation to land tenure, ownership and land use conflicts versus sustainable forest management as well as land use planning for forest development activities (URT, 2008). While the Village land Act (1999) provides for the management and

administration of land in villages (as registered under the Local Government Act No. 7 of 1982), and for related matters; the Land Act (1999) provide for the basic law in relation to land other than the village land, the management of land, settlement of disputes and related matters. The provisions of both the Land Act (1999) and the Village Land Act (1999) and related regulations provided enabling environment for communities to participate in land management by recognizing and acknowledging existing customary rights practiced in by different ethnic groups in Tanzania (Village Land Act, 1999, Section 20: 97-98). Further, the Acts allows for registration of customary land rights to hold common resources on land such as forests by households, groups, or communities.

8.0 Forest Act (2002) and Forest Regulations (2004)

In accordance with the National Forestry Policy (1998), the Forest Act (2002) provides the legal framework to implement the National Forest Policy. Together with other objectives stipulated in the Act, the Forest Act (2002) aims to "encourage and facilitate the active participation of the citizen in the sustainable planning, management, use and conservation of forest resources through the development of individual and community rights, whether derived from customary law or under this Act, to use and manage forest resources;…to delegate responsibility for management of forest resources to the lowest possible level of local management consistent with the furtherance of national policies; …to promote coordination and cooperation between the forest sector and other agencies and bodies in the public and private sectors in respect of the management of the natural resources of Tanzania…"[Part II Section 3]. The legal bases under the forest act provide incentives for rural communities to participate in forest conservation. Such incentives include; waiving state royalties on forest produce and can, if they chose, retain 100% of revenue from sale of forest products (Forest Act Section 78 (3)), retaining fines levied on village land in respect of village land or community forest reserves as approved by village bylaws", as well as the power to confiscate and sell any forest produce or equipment used to illegally harvest in a village land forest reserve (Forest Act, Section 97 (1)(b)).

Furthermore, Forest Act (2002) classifies for four types of forests: First, National Forest Reserves (NFRs) managed by Central Government. This type consists of; NFRs managed for protection, NFRs managed for production, Nature forest reserves, and Forests on general lands which are managed by central government. Second, the Local Authority Forest Reserves (LAFRs) managed by local government. These types consist; LAFRs (managed for protection and LAFRs managed for production) and forests on general lands managed by local governments. Third, the Village Forests which consist of; village land forest reserves (VLFRs); community forest reserves created out of village forests (CFRs), and forests which are not reserved which are on village land and of which the management is vested in the village council. The fourth type of forests are Private forests which includes; forests on village land held by one or more individuals under a customary right of occupancy, and forests on general or village land of which the rights of occupancy or a lease has been granted to a person or persons or a partnership or a corporate body or a Non-Governmental Organisation or any other body or organisation for the purpose of managing the forest which is required to be carried out in accordance with this Act. The enactment of the Forest Act (2002) was followed by passing of Forest Regulations (2004) which guided its operation.

9.0 Participatory Forest Management Models

The development of legal framework to support PFM has inverted the colonial approach of excluding local communities and other stakeholders from management of most land and associated resources. PFM has been adopted as an official strategy to allow for wide participation of stakeholders in forest resource management. PFM has three main policy objectives: improved forest quality, through sustainable management objectives; improved livelihoods through increased forest revenue and secure supply of subsistence forest products; and improved forest governance at district and village levels through *effective* and *accountable* resource management institutions (URT, 2003). Theoretically, it is assumed that forests can be better managed under close involvement of forest users in decisions regarding appropriate management plans, rules and obligations pertaining to the resource (Pretty & Ward 2001, Ostrom 1990; 1999). Two major forms/approach of PFM are being promoted in Tanzania; Joint Forest Management (JFM) and Community-Based Forest Management (CBFM) (URT, 2006).

10.0 Joint Forest Management (JFM)

Joint Forest Management (JFM) is recognized as a form of PFM approach that local communities become co-managers of forests on land that has been set aside (reserved land) by government as part of either Local Authority or National Forest Reserves (URT, 2007). The co-management aspect can as well take place between the community and private forest owners (URT, 2002). The management aspect that is shared jointly includes the practical responsibilities of management and the authority to make decisions regarding the management aspects such as forest protection and regulations pertaining to costs and benefits from the resource (URT, 2007). The two parties involved in a joint management of forest e.g. the local community with *Central Government* (in National Forest Reserves) or *with District Government* (in Local Authority Forest Reserves) or with private forest owners enter into agreements called Joint Forest Management Agreements (JFMAs). If a village signs a JFMA with either central or local government regarding the use and management of the forest, it (the village) should define an area "Village Forest Management Areas" within the forest that it will jointly manage with government as stipulate in the Forest Act, 2002 (Section 39 (2)).

JFMAs is a legal document that spells out how the costs and benefits of forest management are shared between the forest owner (e.g. central government or district government) and the managing partner (local community). Depending on the category of forest that is co-managed, the overall objectives may be for protection or production or a mixture of both (URT, 2007). In principle, JFMAs are required to be signed before a JFM programme is implemented, however experience show that most JFM programmes are being implemented in many parts of Tanzania before the respective JMAs become fully operational following their lengthy legal related aspects.

11.0 Community-Based Forest Management (CBFM)

Community-Based Forest Management (CBFM) is a form of PFM approach that takes place on village land, on forests that are owned or managed by the Village Council on behalf of the Village Assembly (URT, 2007). It is under CBFM approach were villagers have legal rights to establish village forest reserves (Village Land Forest Reserves and Community Forest Reserves)

as classified by the Forest Act (2002) or to establish Private Forest Reserves (URT, 2002; 2007). Different from JFM which takes place on National and Local Authority Forest Reserves, CBFM takes place inside village Lands (URT, 2007). Depending on the category of forest that is but under CBFM, the overall objectives may be for protection or production or a mixture of both (URT, 2007). The CBFM approach empowers the community to become both managers and forest owners. The communities elect village institutions to play the role of management and operations regarding production and/or protection of the forest. As per CBFM guidelines (URT, 2007), the role of the district authority (to which the owner of the forest is located) is to support and assist the owner to manage the forests sustainably (URT, 2002; 2007).

Under CBFM approach, a village land forest reserves (VLFR) is usually owned and managed by a single village within its village boundaries. In some areas where the forest covers more than one village, the Forest Act of 2002 (Section 32(3)) allows for a single VLFR to be owned and managed by more than one village even if respective villages are administratively under different local authority (URT, 2007). The overall management responsibility (if seems appropriate) is assumed by a "Joint Village Forest Management Committee (JVFMC)" comprising of members elected from each village council. Which is not clearly started and which has been a sources further degradation of the forest and trees, it the lack of clear management strategy of the village forest and trees which are not under CBFM. Thus, since the establishment of the CBFM went hand in hand with the marotarium of access to the forest, majority of the communities extended their forest needs into the nearby unprotected forest, hence leading to displacement effects.

12.0 PFM Implementation and Coverage in Tanzania Mainland

Implementation of Participatory Forest Management (both JFM and CBFM) was initiated as pilot activities. Early projects implemented in 1990s such as Duru-Haitemba forest in Babati District, Mgori Forest Reserve in Singida District and SULEDO forests under the SIDA-funded Land Management Programme (LAMP) provided important lessons for scaling up and for policy implication as they were implemented under a range of social and ecological conditions (Blomley and Ramadhani 2006; 2007). By 2008, most PFM programmes were supported by the government of Tanzania in collaboration with DANIDA and Ministry of Foreign Affairs of Finland. Other players including the World Bank, through the Tanzania Forest Conservation and Management Project (TFCMP) and the Tanzania Social Action Fund (TASAF) provide support to community level (URT, 2008). In 2005, Tanzania mainland was estimated to have 35.3 million hectares of forests (FAO, 2009), which is currently estimated to be equivalent to 40% of the country's area (FAO, 2010).

13.0 JFM and CBFM Coverage

As a result of implementation of PFM, the size of forest area managed by communities has grown considerably since the 1990s (Blomley and Ramadhani, 2007). By 2009, about 14.3 million hectares of forests were within gazetted Forest Reserves either under National Forest Reserves, Local Authority Forest Reserves, Village Land Forest Reserves, Private and Community Forest Reserves for both production and protection purposes (URT, 2009). Additional 2.5 million hectares of forests were proposed Forest Reserves. Available data on PFM e.g. from end of 1990s indicates increase in adoption and spread of both CBFM and JFM across

Tanzania. The total forest area under PFM has increased from 348,550 ha in 1999 to 4,122,500 ha in 2008 with number of villages involved in PFM increasing from 555 to 2,328 respectively (URT, 2009).

In 2012, MNRT undertook a detailed survey of PFM in the country. Data was collected from 80 district councils and a range of projects and organizations involved in PFM implementation on the ground. Table 1 shows that PFM has spread in many parts of the Mainland Tanzania. The table indicates that the total area of forest covered by PFM arrangement increased from 4,122,500ha in 2008 to 7,758,788 ha by 2012. Thus an increase of about 50% for four years.

Table 5: Overview of PFM on mainland Tanzania

Total area of forest covered by PFM arrangements	7,758,788 hectares
Percentage of total forest area under PFM	23.3%
Number of villages involved in PFM	2,285
Percentage of total villages in mainland Tanzania involved in PFM	21.5%
Number of villages with declared/gazetted village forests or signed Joint Management Agreements	580
Number of districts where PFM is operational	77

Source: URT 2012

The coverage of PFM has continued to expand since its introduction in early 1990s. The number of participating villages has expanded over the past decade reflecting the continuing investments being made by the Government and Development Partners' community alike. Table 2 shows the increasing number of forest area and villages covered by CBFM and JFM.

Table 6: Overview of Forest Area and Villages covered with PFM (CBFM and JFM) in mainland Tanzania

Year	CBFM		JFM		Reference
	Forest area under CBFM (ha)	No. of villages with CBFM	Forest area under JFM (ha)	No. of villages with JFM	
1999	323,220	544	25,330	11	Wily and Dewees, 2001
2002	1,085,300	845	1,175,550	525	URT, 2001
2006	2,060,600	1102	1,612,250	719	URT, 2006
2008	2,345,500	1457	1,777,000	863	URT, 2008
2012	2,366,693	1233	5,392,095	1052	URT, 2012

Table 2 shows that the area of forest under both CBFM and JFM has continued to increase. JFM now covers more forest area compared to CBFM; this is due to the fact that most of the reserved forests under JFM are of big sizes as compared with those under CBFM. From the URT 2012 survey, CBFM now covers around 12.1% of unreserved forest land while JFM covers approximately 41% of forests within gazetted forest reserves under central or local government.

Furthermore Table 3 suggests that the number of participating villages with CBFM has decreased since the 2008 survey. It is to be noted that this decrease does not mean a decline in investment but rather is the correction made from the previous survey where there were double

counting of the villages where forest reserve was managed by more than one village (URT, 2012).

Table 7: Overview of CBFM and JFM coverage in Mainland Tanzania

Community-Based Forest Management (percentages)		Joint Forest Management (Percentages)	
Number of declared Village Land Forest Reserves	409	Number of villages that have signed JMAs	171
Number of Gazetted Village Land Forest Reserves	71	Number of National Forest Reserves with JFM	181
Number of District where CBFM is implemented	69	Number of Local Authority Forest Reserves with JFM	101
Percent of public land forests under CBFM arrangements	12.1	Percent of total area reserved by National or Local Government under some form of JMA	41
Percent of Villages on Mainland Tanzania that are engaged in CBFM activities	11.7		

Source: URT 2012

In addition to data presented in Table 3, by 2012 the number of declared Village Land Forest Reserves (VLFRs) under CBFM had reached 509 in 69 districts, with a total of 71 gazette VLFRs mostly in Iringa Region. Of 1052 villages where JFM activities are implemented, only 171 villages have signed the Joint Management Agreements (JMA), approximately 17%.

With regards to the type of forests covered by the different models of PFM, CBFM appears to have covered mostly miombo woodlands, coastal and acacia woodlands where majority of unreserved forests can be found making them suitable for management by village governments. On the other hand, JFM arrangements cover mostly the montane catchment forests in the high biodiversity Eastern Arc forests and Mangrove forests along coastal Tanzania, which were already reserved by central or local governments. The JFM initiative has been strengthened by national and international NGOs promoting forest conservation such as Tanzania Forest Conservation Group, Wildlife Conservation Society of Tanzania, WWF and CARE International.

Analysis done in 2008, indicated CBFM to have covered mostly miombo woodlands, coastal and acacia woodlands where majority of unreserved forests can be found. On the other hand, JFM arrangements cover mostly the montane evergreen forests and mangroves, which were already reserved by central or local governments (URT, 2008) as illustrated in Figure 2.

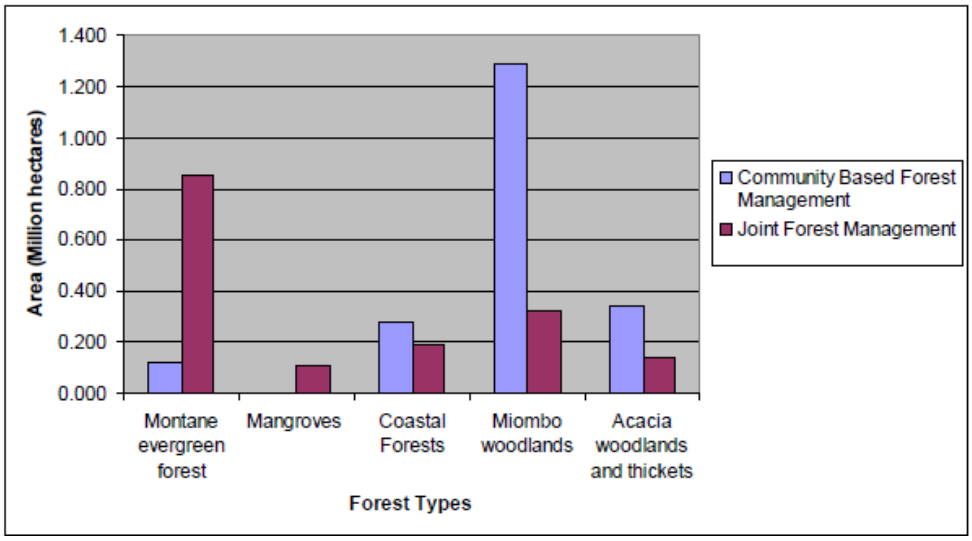

Figure 2: Coverage of CNFM and JFM in different Forest Types [Source: URT 2008]

URT (2012) documents reduced levels of disturbance from illegal harvesting for charcoal and timber from forests placed under community management compared to forests on the general land and under government management without community involvement. This is evidenced from the regular monitoring reports by FBD and PMO-RALG (Prime minister's Office-Regional Administration and Local Government) Officials. The major reason for this is the fact that majority of the PFM had undergone moratorium to allow the forest to recover without giving the adjacent community alternatives to their NTFP needs. Thus, adjacent communities displaced their forest products needs to the nearby unprotected forest. The initial expectation was that with the moratorium in the forest, the adjacent community could plant their own tree on their own farm to cater for their household needs of fuel wood, thus leading to replacement effects of PFM, however, given the fact that it takes time for the tree to grow to the harvest level the immediate effects was displacement, whereby the community extended their efforts into the nearby non-PFM forest. Furthermore, following improved forest management, farmers with fields bordering the forest complain of crop raiding caused by increased wild animals.

There has been growing dissatisfaction expressed from participating communities regarding JFM (Robinson and Lokina, 2011). This is because a final decision regarding the sharing of benefits from JFM has yet to be reached. Without a clear and binding agreement on how forest benefits and revenues will be shared between communities and the government, many agreements remain unsigned explaining why only a small number of JMA have been signed (TNRF, 2012).

The efforts to solve this problem have started under Tanzania Forest Services Agency by reviewing the formally proposed costs and benefits sharing rates and mechanism for ploughing back communities' shares taking into consideration how communities living near to high biodiversity catchment forests and nature reserves will be motivated as in such forest harvesting and utilization are restricted (URT, 2012).

Communities in areas implementing both Community-Based Forest Management and Joint Forest Management remain to be the central point for successful implementation of PFM activities. At the government level, PFM activities are spearheaded by the Ministry responsible for forest resource administration (i.e. the Ministry of Natural Resources and Tourism through Tanzania Forest Service). In addition, PFM activities have gained support from a range of other actors including the local government, local NGOs, international NGOs and through bilateral agreements.

14.0 Costs-Benefits sharing mechanism

As described earlier, cost-benefit sharing arrangements differ significantly between CBFM and JFM model. Villages are provided with legal rights and incentives to own and manage forest resources on village land in ways that are both sustainable and profitable (The Local Government Act No.7 of 1982, Village Land Act No. 5 of 1999 and the Forest Act No. 14 of 2002) Under the Forest Act (2002), among other things; communities have legal rights to benefit from waiving state royalties on forest produce (Ostrom, 1999, Pretty and Ward 200), retaining 100% of revenue from sale of forest products, levying and retaining fines, and confiscation of forest produce and equipment from illegal harvesting. In a study to examine the impacts of PFM (CBFM) to local forest-based livelihood in the biodiversity hotspots of the Eastern Arc Mountains of Tanzania, findings demonstrated a minimal contribution of CBFM to poverty reduction when combined with support for forest-linked income generating activities (Meshack, 2005; Robinson and Lokina, 2011; Lokina, 2012). On the other hand, the study identified negative impacts to the community related to CBFM establishment, including; reduced access to forest products and services, prohibited access to forested land, increased crop damage by wild animals or crop pests, and loss of income by traditional honey collectors and hunters.

In high biodiversity areas where JFM is heavily promoted, management costs incurred by communities living around protected areas are higher than the benefits obtained from supporting JFM in their area. While forest put under JFM for water catchment purpose used for irrigation, industrial activities, domestic purpose etc. by downstream users, no tangible benefits is returned to compensate conservation efforts at the local level. Under JFM, villages are recognized as co-managers but there is currently no clear and functional guidance on cost-benefits sharing mechanism between the managing partners. Modalities of determining cost-benefit sharing for JFM in Protection (Catchment) Forest Reserves and Production (Natural) Forest Reserves are different. In National or Local Authority Protection forests utilization of timber and non-timber products by communities is not permitted but negotiations can be made to allow ‘‘limited and localized’’ utilization such as of water, honey, firewood, medicinal plants. In some cases were local communities are permitted to harvest timber tree, limited timber is allowed for social development activities such as construction of village infrastructure (e.g. schools and clinics). In Production forests where production is permitted, a share can be channelled to the communities following a harvest of forest resources (URT, 2007).

Number of studies has been done to assess three policy objectives of PFM (improved forest quality, livelihood and governance) (see for example; TAFORI, 2009; Robinson and Lokina, 2011; Lokina, 2012. Results of different researches done attempted to answer the question on

whether PFM is the right option for sustainable forest management in Tanzania. Benefits arising from PFM in line with its policy objectives vary greatly from site to site and depend on PFM model (either CBFM or JFM) adopted.

15.0 Improved Forest quality

Mixed results are available to support the evidence that PFM approach results into improved forest conditions. Overall results indicate that; in most areas JFM has been influential in restoring and sustaining forest conditions and in reducing forest degradation as compared to forests managed by the government alone or under open access regime (Pfliegner, 2007; URT, 2009). Indicators used to justify improvement in forest condition includes: increases in basal area and volume, declines in number of stems per ha in forests managed under CBFM, and increases in JFM areas and forests under exclusive state management.

A comparative study of three matched pairs of similar forests under JFM and state management showed forests under JFM to be in better conditions than those without JFM, (Pfliegner and Moshi 2007; Robinson and Lokina, 2011). Better forest conditions included: higher numbers of live and naturally dead trees, poles, or withies, and fewer cut timber trees, 68% fewer freshly cut timber trees than 70% less frequent in the JFM than in forest without co-management. In addition, almost 34% more live timber trees, 45% more live poles, and more than 55% more withies were recorded in JFM areas, and lower incidences of freshly cut poles and withies (TAFORI, 2009).

Table 8: Households' Opinion about the success of PFM

	JFM (n=646)		**CBFM** (n=206)	
	Frequency	%	Frequency	%
Successful	537	83.2	154	74.8
Not at all successful	55	8.52	25	12.1
Don't know	51	7.89	26	12.62
Too early to tell	3	0.46	1	0.49

Source: Lokina and Banga 2010

16.0 Improved Livelihood

The benefits of PFM implementation on livelihood of the community can better be assessed by considering livelihood assets as defined by Ellis (2000) to include human, natural, social, financial and physical assets as well as activities and access to these components. In the same way as improvement in forest conditions vary from site to site depending largely on the PFM model adopted, the contribution of PFM to improved livelihoods and incomes at both community and household levels takes the same route as indicated by various studies/projects.

Promotion of alternative livelihood activities (see for example Ostrom 1999; Hanley et al., 1997) such as fish farming, butterfly rearing, rearing of small livestock, beekeeping, on-farm tree planting, agroforestry and eco-tourism has been a concern in JFM forests especially those under National Forest Reserves. Such alternative livelihood activities contribute to improved household income. A study by Nshubemuki (2009) on contribution of agroforestry practice involving

planting trees suitable for firewood, timber and charcoal communities surrounding the Ruvu North Forest Reserve (under JFM) indicated that; each participating household in four villages (Kongowe, Mwendapole, Msangani and Mkuza) earned a total of TZS 310,329 in 2007 from selling charcoal, firewood, poles, agricultural crops and tree seedlings from JFM plots. This income contributed significantly in improving household income. Butterfly farming is among best practices to improve income of participating communities in Eastern Usambara Mountains (Nshubemuki, 2009).

In another initiative, the Mpingo Conservation and Development Initiative (MCDI) facilitated the first commercial harvest of Mpingo (the East African Blackwood, *Dalbergia melanoxylon*) in a certified VLFR managed by Kikole village, in Kilwa District. Upon completion of harvest in November 2009, the village obtained revenue of US$1,800 in return of 15 cubic metres of *D. melanoxylon* (TNRF, 2012). The money was used by the village to pay for forest patrols and other management activities, as well as to complete a new house for the village midwife in the village. Prior to approval of the management plan for the establishment of VLFR in Kikole, the village has received previously around 4% per sell of each log for 63 logs sold. In JFM forests were harvesting is not allowed; participating villages have the right to retain fines collected from local patrols of illegal activities happening in the forest (see for example Robinson and Lokina, 2010).

17.0 Improved governance

The objective of PFM to improve forest governance seems to vary depending on the nature of the community involved and the PFM approach undertaken. Generally, most PFM seems to focus on the process to get the PFM in place while issues of governance appear to be cross cutting through participation, transparency, accountability, and rule of law. PFM build upon existing government structure at the community level. In PFM, the practical responsibility to manage the forest is exercised through village institutions elected by all community members, and the authority to make decisions regarding forest management is vested in village institutions (URT, 2007). As per requirement by the Forest Act, 2002, the village must elect a committee-usually called a Village Natural Resource Committee (VNRC) or Village Environment Committee-to manage their forest on their behalf. VNRC is a sub-committee of Village Council and is (as a must) selected by the Village Assembly and not appointed by the Village Council and is the principal body concerned with the management of the Village Land Forest Reserve (for CBFM) or a Village Forest Management Areas (for JFM). In CBFM, where more than one village shares a forest, participating villages select a Joint Village Forest Management Committee. It is upon existing institutions in the village, with facilitation from the government that aspects of improved governance can be assessed and compared between forests under CBFM and JFM.

18.0 Opportunities to Forest Conservation

Implementation of PFM activities has for the moment not exhausted all opportunities attached to forest management. In addition to cost-benefit arrangements advocated and stipulated in different policies, opportunities of extracting the most from forest resources under PFM through sales of carbon credits through implementation of international policy to reduce emission from

deforestation and forest degradation (REDD) and through community forest certification schemes do exist.

19.0 REDD+ Initiatives

Climate change has been recognized as a global challenge that can be addressed through both national and international efforts. Among efforts to address the problem is to reduce emissions of Green House Gases (GHGs) regarded as major contributor of global warming and hence climate change. Efforts to reduce emission of GHGs are sector specific, and depend on available systems, infrastructure and capacity to enable the process. In the forest sector, a policy to reduce emissions resulting from deforestation and forest degradation in forest rich countries has been conceived not only to reduce GHGs emission but to provide financial incentives to forest owners through sales of carbon credits (through offsets and sequestration). Despite the potential financial incentives associated with the implementation of REDD+ activities in Tanzania, it is still at pilot stages. From the support of the government of Norway, Tanzania (in 2008) started implementation of pilot activities through Non-governmental Organizations distributed in different parts of the country. As sales of carbon credits are not expected in the near future, communities are expected to benefit from activities promoted to reduce drivers of deforestation and forest degradation.

Several challenges are foreseen regarding implementation of REDD+ activities. At the international level, modalities to finance REDD+ activities have not yet been finalized. At the national level, among other things REDD+ activities have to demonstrate real offsets, address leakage, prove additionality, permanence, as well as develop an effective measurement, reporting and verification system (MRV system). Furthermore, a fair and transparent and workable cost-benefit sharing mechanism has to be developed.

Revenues from sales of carbon credits under REDD+ activities are not expected in the near future, and probably not within the next five to ten years. Communities are expected to benefit from alternative income generating activities, and from activities to address drivers of deforestation and forest degradation stipulated in the action plan for implementation of the National REDD+ Strategy. Currently, REDD+ Pilot projects in Kilosa and Kilwa; are working to design the best approach for distribution of revenues from sales of carbon credits at the community level. Individual payments done to community members are important source of income at the household level, while payments directed to support community projects are important for the development of the whole community. Modalities of payments in each pilot village are community-driven and differ according to agreed bases.

20.0 Forest Certification Schemes

Forest certification is defined as "a system to give recognition to those forest managers who follow international standards and best practices of responsible management and fair treatment of local people". Most certified big companies who have the capacity necessary to meet the demanding standards manage forests around the world. However, community managed forests can also be certified. The Forest Stewardship Council (FSC) runs the best-known forest

certification scheme in the world. This scheme is also widely recognized as the best and toughest; it is the global gold standard in responsible forest management.

Several companies in Tanzania have pursued FSC certification for plantation forests, most notably Green Resources Limited and Tanganyika Wattle Company. The Mpingo Conservation and Development Initiative (MCDI) is the first organization in Tanzania to obtain an FSC certificate for community-managed forests, and hold the only such certificate in the whole of Africa. MCDI is working in Kilwa District, South-Eastern Tanzania to help and encourage the community to engage in Participatory Forest Management (PFM) by setting Village Land Forest Reserve (VLFR) in their area. This arrangement is considered beneficial as in VLFR the community will own the rights to forest resources within the reserve. More recently, MCDI has been working to combined certification scheme and REDD+ to catalyze expansion of PFM into new villages across the miombo woodlands of southeastern Tanzania. Establishment of more PFM is in turn expected to accrue revenues from REDD+ payments, which in turn will lead to more PFM and more revenue to communities from selling FSC certified mpingo.

21.0 Discussion and Conclusion

The key issues that clearly emerged from this review and which can guarantee sustainability of PFM is the question of cost-benefit sharing mechanism. Implementation of cost-benefit sharing mechanism between the government (owner) and the local communities (co-managers) in JFM forests set for production have not yet been clear. This legal gap has been mentioned as another reasons leading to delay in signing JFMA (Bromley and Ramadhani, 2007; URT, 2009). In production forest, the government collects significant revenues from harvesting of timber, charcoal and firewood by commercial timber operators. Moreover, direct benefits arising from protection of forest such as water catchment forest and high biodiversity forests have not been realized by local communities and hence hinder active participation. The government through the Ministry of Natural Resource and Tourism proposed to undertake revision of benefit revenue sharing mechanisms; however the process has not been finalized and no standard cost-benefit ratios have been agreed (URT 2012). Initiatives such as Payments for Environmental Services (PES) and REDD+ in high biodiversity and catchment forests are recommended to enhance the flow of benefits to the local community (URT, 2008). The challenge remains on how to do appropriate monitoring of PES/REDD+ to ensure that local communities gain significant benefits.

Despite positive willingness of some community to participate in PFM implementation, poverty among the community remains a central constraint prohibiting effective participation. To address poverty, PFM implementers need to view PFM in a broader scale by considering the community and comprehensiveness of the environment. Existing policies and legal set-up provides strong incentives for local participation in Community-based Forest Management (CBFM). In some areas with rich forest resources CBFM has the potential to generate significant and widespread economic benefits to the communities involved through their legal rights to consumptive use of forest resources in line with approved management plan. However, translating this opportunity into a reality has never been the case in most areas due to a range of reasons including (according to URT, 2009); Institutional failures and governance shortfalls in the forest sector, limited

capacity (human, operational resources and legal understanding) at local government level, lack of knowledge among forest-dependent communities on CBFM opportunities, concerns over loss of forest revenues to District Councils, focus on conservation and protection rather than sustainable utilization.

Furthermore, effective governance and enforcement is important for attaining PFM objectives of improved forest quality, improved livelihoods, and improved forest governance despite the presence of a well-described CBFM or JFM structure. Community members are willing to participate in PFM activities if awareness-raising campaigns are put at the forefront of operations, at early stages of PFM. Awareness raising campaigns and appropriate legal environment creates enabling environment for adoption of PFM programmes in villages. This goes hand in hand with involvement of local communities in various stages of PFM in order to win their (community) confidence and create a sense of ownership, and hence sufficient time and efforts are required.

Lack of landscape or ecosystem level approach to implement PFM activities has been leading to displacement (leakage) of degradation of forests in areas not covered by PFM. Thus, another key issue is on addressing leakage by implementing PFM within a landscape approach: A landscape approach or an ecological level approach undertakes PFM at a wide scope by taking into account nearby forests. This approach is more preferred than the current forest-by-forest or village-by-village basis as it takes into account displacement of prohibited activities into neighboring less protected forests. For a practical JFM, Lokina and Robinson (2008) recommend a need for a CBFM in areas where JFM operates in order for villagers to collect forest resources under managed conditions.

JFM poses additional challenges in that it requires the equitable sharing of both costs and benefits if it is to work effectively. Most JFM agreements negotiated to date have taken place in so called “protected forest” (typically high biodiversity, montane catchment forests) that have few legal benefits as the forest is strictly conserved. Consequently the issue of revenue sharing does not arise (and many have argued, is resulting in questionable agreements) (Blomley, 2006). To many, this is viewed as government is trying to shed its duty to the local community without compensating for their time and resources. However, in “production forests” where harvesting takes place (both natural forest and plantations), as this review has shown, significant revenue is created from the use of timber, charcoal and firewood by commercial timber operators. This is the major source of revenue for FBD and much of it is retained for operational costs at the ministerial level and field levels. Under such circumstances, resistance from some quarters within central government to share revenues in JFM agreements is evident and consequently no standardized JFM cost-benefit sharing ratios have been agreed and promulgated nationally.

The benefits of participating in the PFM are not always assured. In some cases, especially JFM, PFM is being implemented on the basis of perceived, rather than assured, expectations. For example, even where basic infrastructure does not exist, communities are encouraged to promote ecotourism as an income generating activity. In many cases this is an unrealistic expectation. In

some JFM operations, communities believe that they will eventually be allocated ownership rights over state forests. This is very unlikely to happen in the immediate future.

What is emerging from the review is that PFM have succeeded in restoring or maintaining forest quality under both CBFM and JFM arrangements. Encroachment has decreased, unregulated activities such as charcoal burning and timber harvesting decline and game numbers increase. However, it is clear that communities have yet to fully capture the potential social and economic benefits of local forest management and as such the contribution of PFM to poverty reduction remains limited, despite a clear commitment from the government to do so. The revenues generated by villages from sustainable forest management are still relatively low, given the high value and large areas of forest resources under village control. And this is where the big challenges lies with PFM, on their sustainability. The only important sources of revenue to villagers are fines and levies, by the village council on those found conducting illegal activities, which will definitely decline as enforcement under PFM increases. Furthermore, it is evident that neighboring forests, which are not under any PFM arrangement, are threatened by over-utilization and extinction. This is more for those bordering the JFM forest, which has a very limited direct use. Thus, to protect non-PFM forest from further degradation and even extinction, landscape approach to conservation is immediately called for.

References

Angelsen, A. (1999) "Agricultural Expansion and Deforestation: Modelling the Impact of Population, Market forces and Property Rights*," Journal of Development Economics*, vol. 58, pp. 185-218.

Angelsen, A. and D. Kaimowitz (1999) "Rethinking the Causes of Deforestation: Lessons from Economic Models," *The World Bank Research Observer*, Vol. 14, No. 1, pp. 73-98.

Blomley, T. and Ramadhani, H. (2006) "Going to Scale with Participatory Forest Management: Early Lessons from Tanzania," *International Forest Review* 8(1): 93-100

Blomley, T. and Ramadhani, H. (2007) "Participatory Forest Management in Tanzania: an Overview of Status, Progress and Challenges Ahead," *The Arc Journal*. Issue 21: 3-5.

Blomley, T., Pfliegner, K., Isango, J., Zahabu E., Ahrends, A., Burgess, N. (2008) "Seeing the Wood for the Trees: Towards an objective assessment of the impact of Participatory Forest Management on Forest Condition in Tanzania," *Oryx.* 42(2), 1–12.

Cavendish, W. (1998) "The Complexity of the Commons: Environmental Resource Demands in Rural Zimbabwe," *Working Paper, WPS 99-8*, Centre for the Study of African Economics, Oxford

DANIDA, (2004). Review of the Present Royalty and Revenue Collection System for Forest Products in Lindi Region. Final Report. PEM East Africa Ltd.

Ellis, F. (2000) *Rural Livelihoods and Diversity in Developing Countries,* Ney York, Oxford University Press.

Food and Agriculture Organization (2009) *State of Worlds Forests*. Rome.

Food and Agriculture Organization (2010) Global Forest Resources Assessment 2010: Country Report, Tanzania. FRA 2010/222. Rome, Italy. Available at www.fao.org/forestry/fra

Gravelle, H. and R. Rees (1992) *Microeconomics*, Financial Times, Prentice Hall, Pearson Education Ltd., 2nd edition, p. 752.

Hanley, N., J. F. Shogren and B. White (1997) *Environmental Economics in Theory and Practice*, Macmillan Press Ltd., London, England, p. 464.

Hardin, G. (1968) "The Tragedy of the Commons," *Science* , Vol., 162, pp. 1243 – 1248.

Kajembe, G.C. and Kessy, J.F. (2002) Joint Forest Management in Urumwa Forest Reserve, Tabora, Tanzania. Aprocess in the making. In Virtanen, P. and Nummelin, M. (Eds). Forests,

Chiefs and Peasants in Africa: Local Managemnt of Natural Resources in Tanzania, Zimbabwe and Mozambiques. *Silva Carelica* 34:141-158.

Kajembe, G.C, Y.M Ngaga, S.A.O Chamshama and M.A Njana. (2009). Performance of Participatory Forest Management (PFM) Regimes in Tanzania: Preliminary Findings in the Project "Applied Research in PFM". In Nshubemuki et al., (Editors). Proceedings of the First Participatory Forest Management (PFM) Research Workshop: Participatory Forest Management for Improved Forest Quality, Livelihood and Governance.

Lindsay, J. M. (1999) "Creating a Legal Framework for Community-based Management: Principles and Dilemmas*,"* *Unasylva*, Vol. 50, No. 199/4, pp. 28-34.

Lokina R. B (2012) "Determinants of Successful Participatory Forest Management in Tanzania," *Tanzania Economic Review*

Luoga, E. J., E. T. F. Witkowski and K. Balkwill (2000) "Economics of Charcoal Production in Miombo Woodlands of Eastern Tanzania: Some Hidden Costs Associated with Commercialization of the Resources," *Ecological Economics,* 35, pp. 243-257.

Matakala, P. and F. Kwesinga (2001) "Community Needs and Demands and their Actual Involvement in Forest Management; A Regional Analysis, Key note Address In: Stisen Müller, B., S. Hald, T. Treue and T. E. Boon (Editors) (2001): *Proceedings from the Danida DANCED Workshop on Sustainable Forest Management in Southern Africa*, Windhoek, Namibia, August 14, p. 289.

Meshack, C.K., (2005) "Impact of Participatory Forest Management on Local forest Based Livelihoods: Experience from Eastern Arc Mountains Forests of Tanzania. In Nshubemuki et al., (Editors). *Proceedings of the First Participatory Forest Management (PFM) Research Workshop: Participatory Forest Management for Improved Forest Quality, Livelihood and Governance*. June 2009.

Monela, G. C., G. C. Kajembe, A. R. S. Kaoneka and G. Kowero (2000) "Household Livelihood Strategies in the Miombo Woodlands of Tanzania: Emerging Trends," *Tanzania Journal of Forestry and Nature Conservation*, Vol. 73, pp. 17-33.

MNRT (1998): *National Forest Policy*, The United Republic of Tanzania, Dar es Salaam, March 1998, Printed by Government Printer, Dar es Salaam, Tanzania, p. 59.

Neher, P. A. (1990) *Natural Resource Economics – Conservation and Exploitation,* Cambridge University Press, p. 360.

Nshubemuki et al., (2009). *Proceedings of the First Participatory Forest Management (PFM) Research Workshop: Participatory Forest Management for Improved Forest Quality, Livelihood and Governance.*

Oakerson, R. J. (1992) Analyzing the Commons: A Framework, In: Bromley, D. W. (ed.) (1992): *Making the Commons Work: Theory, Practice and Policy*, ICS Press, San Francisco, pp. 41-59.

Ostrom, E. (1990) *Governing the Commons – The Evolution of Institutions for Collective Action, Political Economy of Institutions and Decisions*, Cambridge University Press, Cambridge, p. 280.

Ostrom, E. (1998) "A Behavioural Approach to the Rational Choice Theory of Collective Action - Presidential Address American Political Science Association, 1997," *American Political Science Review*, Vol. 92, No. 1, pp. 1-22.

Ostrom, E. (1999) "Self-Governance and Forest Resources," *Occasional Paper no. 20*, Centre for International Forestry Research, Bogor, Indonesia, p. 15.

Pearce, D. W. & R. K. Turner (1990) *Economics of Natural Resources and the Environment*, MPG Books Ltd, Bodmin, Cornwall, UK, p. 378.

Perman R., Ma Y., McGilvray J. and Common M. (1999) *Natural Resource and Environmental Economics,* Edinburgh, Longman.

Petersen, L., and A. Sandhövel (2001) "Forestry policy reform and the role of incentives in Tanzania," *Forest Policy and Economics*, Vol. 2, No.1, pp. 39-55.

Pretty, J. and H. Ward (2001) "Social Capital and the Environment," *World Development*, Vol. 29, No. 2, pp. 209-227.

Pfliegner, K. (2007) "Is Joint Forest Management Viable in Protection of Forest Reserves? Experience from Morogoro Region," *The Arc Journal* 21: 17-20

Robinson, E.J.Z. and R. Lokina (2011) Determinant of the Effectiveness of Participatory Forest Management in Tanzania, University of Dar-es-Salaam, Tanzania.

Tyynelä, T. (2002): Local Management of Natural Resources: Cases from Tanzania, Zimbabwe and Mozambique, In: Seydack, A. H. W., T. Vorster, W. J. Vermeulen & I. J. van der Merwe (2002): *Multiple Use Management of Natural Forest & Woodlands: Policy, Refinements and Scientific Progress,* Symposium Proceedings, Natural Forests and Savanna Woodlands Symposium III, Department of Water Affairs and Forestry, Indigenous Forest Management, Pretoria, pp. 375-383.

United Republic of Tanzania (URT) (1999) Village Land Act and Regulations, No.5, Ministry of Lands and Human Settlements, Government Printer, Dar es Salaam, Tanzania.

United Republic of Tanzania (URT) (2001) National Forest Programme 2001-2010, Forestry and Beekeeping Division, Ministry of Natural Resources and Toursim. Dar es Salaam, Tanzania.

United Republic of Tanzania (URT) (2002) The Forest Act No. 7. Ministry of Natural Resources and Tourism, Dar es Salaam, Tanzania.

United Republic of Tanzania (URT) (2003) Framework for Participatory Forest Management. Ministry of Natural Resources and Tourism. Dar es Salaam, Tanzania.

United Republic of Tanzania (URT) (2006) Participatory Forest Management: Facts and Figures. Forestry and Beekeeping Division, Ministry of Natural Resources andTourism, Dar es Salaam, Tanzania

United Republic of Tanzania (URT), (2004) Local Government Capital Development Grants System. A manual for the assessment of councils against minimum access conditions and performance measurement criteria. PMO-RALG Dodoma.

United Republic of Tanzania (URT) (1982) Local Government Act No 7. Dar es Salaam, Tanzania.

United Republic of Tanzania (URT) (1998) National Forest Policy. Ministry of Natural Resources and Tourism, Forestry and Beekeeping Division, Dar es Salaam, Tanzania.

United Republic of Tanzania (URT) (2006) Participatory Forest Management: Facts and figures. Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism. Dar es Salaam, Tanzania, 7 pp.

United Republic of Tanzania (URT). (2003) Framework for participatory forest management. Ministry of Natural Resources and Tourism. Dar es Salaam, Tanzania, 46 pp.

United Republic of Tanzania (URT) (2001) National Forest Programme in Tanzania, 2001-2010. United Republic of Tanzania, Forest and Beekeeping Division, Ministry of Natural Resource and Tourism.

United Republic of Tanzania (URT) (2002) The Forest Act, No. 14 of 7th June 2002.

United Republic of Tanzania (URT). (2007) Community-Based Forest Management Guidelines: for the establishment of Village land forest Reserves and Community Forest Reserves. Ministry of Natural Resources and Tourism, Forestry and Beekeeping division, Dar es salaam, Tanzania. 57pp

United Republic of Tanzania (URT). 2008. PFM: Facts and Figures, United Republic of Tanzania, Forest and Beekeeping Division. 12pp.

United Republic of Tanzania (URT). (1999) Village Land Act (and Regulations) No. 5 of 1999. Ministry of Lands and Human Settlements, Dar es Salaam, Tanzania.

United Republic of Tanzania (URT). (2009) Participatory Forest Management in Tanzania: 1993 –2009 Lessons learned and experiences to date

United Republic of Tanzania (2012). Participatory Forest Management in Tanzania: Facts and Figures. Ministry of Natural Resources and Tourism, Dar es Salaam.

Varian, H. R. (1992) *Microeconomic Analysis*, W. W. Norton & Company, Third edition, p. 506.

Wily L.A. (2000) "Forest law in Eastern and Southern Africa. Moving Towards a Community-based Forest Future," *Unasylva* No. 203. 29 pp.

Wily, L.A. (1997) "Villagers as Forest Managers and Governments 'learning to let go': The case of Duru-Haitemba and Mgori forests in Tanzania," *Forest Participation Series*, No. 9. IIED, London, UK. 32 pp.

Wily, L.A. and Dewees, P. (2001) "From Users to Custodians: Changing Relations between People and the State in Forest Management in Tanzania," *World Bank Policy Research Working Paper* No. 2569.

World Bank (2002) *World Development Indicators*.