Management of miombo forest resources by communities, is it a reality? A discussion of corner stones for effective community forestry management to support resource commercialization: December 2009

By

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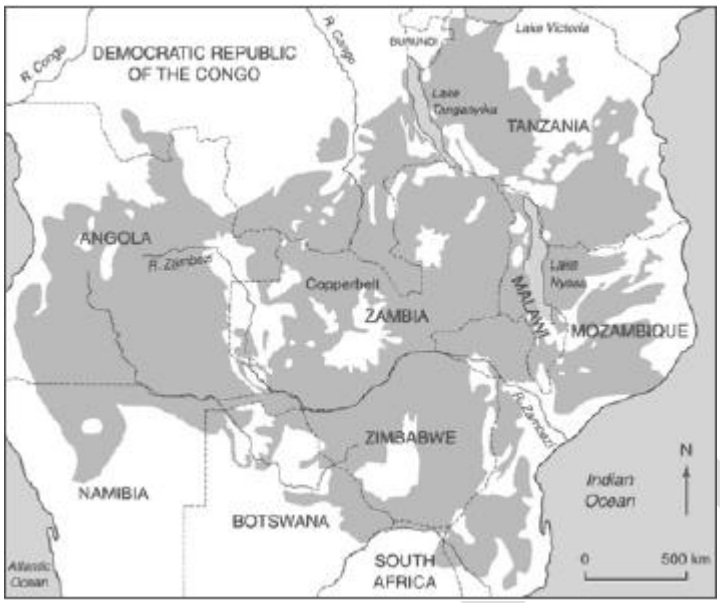
Background

Miombo woodland is a significant biome covering about 10% of the African landmass (est 2.5–4 million km2 depending on definition (Malmer, 2007). Miombo can be found in most countries of Southern and central Africa and is the dominant forest component of Angola, Zambia, Tanzania, Malawi, Mozambique and Zimbabwe (Figure. 1 overleaf). This ecosystem directly supports the livelihoods of over 39 million people, including the lowest *per capita* income and highest population growth rates in the world. A further 15 million people living in towns and cities throughout the region also depend on food, fibre, fuelwood and charcoal produced in miombo (Sileshi, 2007). Frost et al. (1986) in Malmer, 2007, gave a useful definition; "Those tropical and some near tropical ecosystems characterised by continuous herbaceous cover consisting mostly of heliophilous C4 grasses and sedges that show clear seasonality related to water stress. Woody species (shrubs, trees, palms) occur but seldom form a continuous cover paralleling that of the grassy layer."

Miombo is constantly under threat by desertification processes, deforestation, degradation of land and water resources and loss of biodiversity (Sileshi, 2007). The woodland is adjacent to arid areas and deserts, and serves as a barrier to spreading desertification. Deforestation through conversion to farmland, slash and burn agriculture, charcoal burning, bush fires and harvesting of wood (for tobacco curing, smoking fish, timber, poles, etc.) is playing a key role in the modification and transformation of the miombo woodlands landscape. This therefore calls for an urgent need for participation by local community members in managing this complex ecosystem for sustenance of their livelihoods.

Figure 1: Distribution of miombo woodland in Africa



Adopted from Malmer, A, 2007

Introduction

Recent developmental trends have seen a shift from state managed forests to devolution of power and authority to manage forest resources by local communities. This shift has not been transgressed without any challenges especially within the African context. Where this has succeeded as with the Campfire approach shortfalls were also experienced as noted by Campbell, (1999). Commercialization of natural resources is one of the many approaches which has been used to demonstrate benefits and encourage local communities to adopt forest management initiatives. Historical evidence through the use of taboos, norms and traditional management structures suggest that local people are more conscious of there physical environments and are aware and prepared to manage natural resources within there vicinity. What is needed is a clearer understanding and support between those in position of authority to manage resources at a national level and the community at the grassroots.

This study sought to bring out the main cornerstones needed for successful devolution of power to local communities. The study took the form of desk studies on existing literature on community forestry and natural resources commercialization. Various literature both published and unpublished was reviewed. However, it should be noted that the study is not an exhaustive case as evidence is based primarily mostly on the authors experience in Zimbabwe.

Definitions

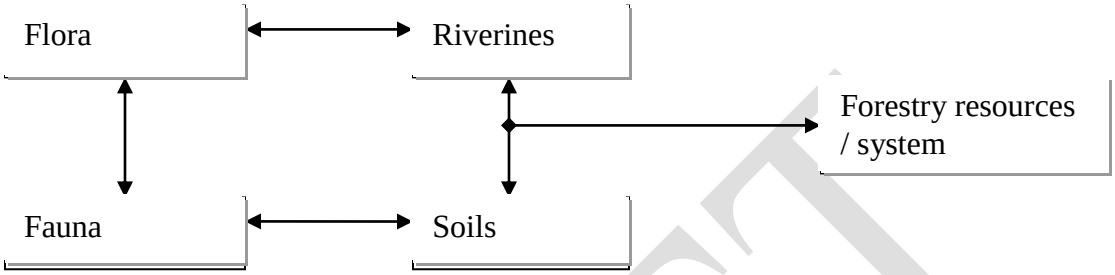
Natural resources

Natural resources are the land, the soil, the water, the air, the plants and the animals. These things are the natural wealth of the community. The community's livelihoods depend on protecting these natural resources and using them wisely.

Forest resources

A forest is an open system with naturally occurring flora and fauna species which are interrelated and depends on one another for their survival. There are various flows from other system such as the hydrological cycle into the forest ecosystem. A diagrammatic illustration of forestry resources would be as follows:

Figure 2: Typology of forest resources



Community

A group of people, usually though not always, in the same geographical location (e.g. village, ward or district) sharing common values, resources, developmental aspirations and challenges.

Community based resources management is about local people (the community) coming together to decide how best to protect and use the natural resources on their communal land. Many members of the community can participate and share the benefits. Using local knowledge, they develop projects to look after the land, water, plants and animals. Together, they decide how to use these things in ways which will bring benefits to the community, now and in the future (SEDT, 2003).

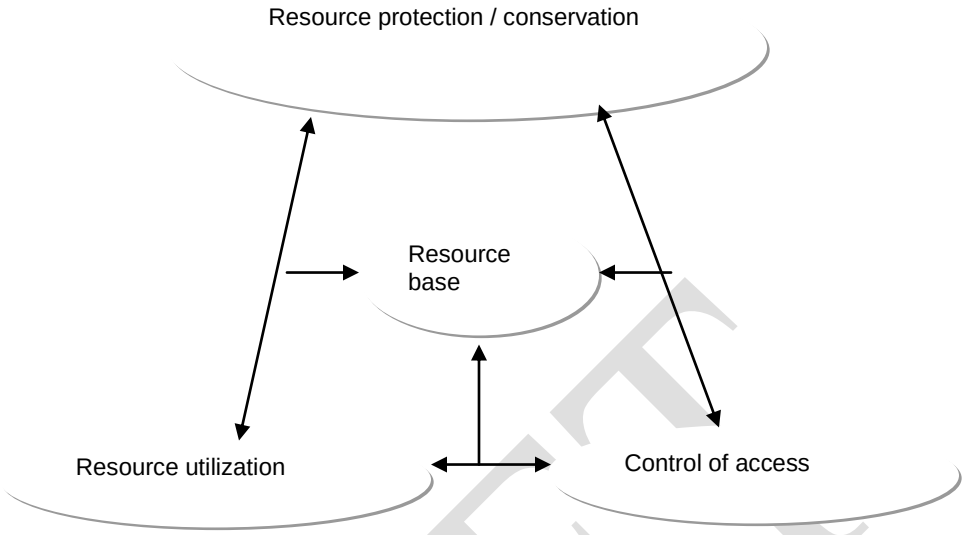
Resource management concept

Management of resources encompasses the following key elements, which are:

- Use
- Control of access
- Protection / conservation

A diagrammatic illustration of resource management by a community would be as illustrated in figure 3 overleaf.

Figure 3: Community resource management



Dr. Sola. 2000

Use

Miombo woodland resources have been widely used by local communities since historical times. These woodlands provide various services to local community members such as shade, food, firewood, water and broad ecosystem functions such as carbon sequestration. IITO, (2002), suggest that a forestry ability to provide required services to communities within its vicinity reflects it healthy status. A forest which is unable to provide the require services is termed a degraded forest. Therefore in using forest resources communities maintain a direct equilibrium between services and resources extraction and the resultant feedback mechanisms into the forest system to maintain a healthy forest.

Control of access

To access a local resource depends primarily on the local societal taboos and norms, level of societal organization and awareness on resource management, feasibility of exclusion and the formal regulatory instruments in place for a particular area. These define who can and when to access resources of a particular nature within a community.

Protection / conservation

Conservation or protection encompasses various mechanisms put in place by resource users to safe guard their local resource base from extinction or depletion. These initiatives are collectively agreed through local management structures in a community set up. These mechanisms however do not inhibit resource protectors from using the resource but emphasis is placed on appropriate measures to take when there are signs of resource depletion.

Benefits of managing forest resources by local people

There are wide array of benefits derived from properly managing natural resources within a certain locality and these can be classified into five broad categories dependant on livelihood capitals:

- Financial e.g. income
- Social e.g. social cohesion
- Human e.g. skills and knowledge
- Natural e.g. resource enhancement through planting e.t.c
- Physical e.g. accumulation of asset base

These benefits are outlined more in the context of commercialization below:

Human Capital:

- Health, nutrition and food security: Commercialisation of NTFP's has positive effects on food security and health if some income from the sales is directed into purchasing food such as beans, meat and vegetables. Kadzere, (1998), found out that that income generated from masawu sales is used to buy maize.

- Local skills and knowledge: Commercialisation reinforces knowledge and skills on where to find the best NTFP and on uses and processing of these products. Cash value obtained from NTFP trading provides an incentive to retain this knowledge. Entrepreneurial skills are built and income is invested into education Shackleton.et al (2003).

- Empowerment of women: Marula trade in Africa and Namibia is dominated by women with their participation providing them with independent income and stature (Shackleton.et al, 2003).

Social Capital In Masvingo province, through commercialization by SAFIRE there is the creation of forest user groups which is a new social forum with the potential for local level development, planning, improved social structure and social cohesion. For example for marula resource there are producer groups and entrepreneurs within the community.

Financial Capital: Commercial harvesting of NTFP's contribute significantly to household income in both cash and in-kind. Income gained helps collectors to cover basic needs and small amounts are saved to start other economic activities (Nicolas. 2004). Provision of this capital can be a significant outcome of community forestry based on its availability and uptake by households (Om Prakash. 2003).

Natural Capital: Om Prakash. (2003) suggests that in areas where the tree density is declining largely as a result of deforestation, energy and livestock browsing, exacerbated by poor enforcement of traditional and formal regulations, commercialisation is more likely to have a positive impact on natural resource base. Management of resources also improves aesthetic beauty of the natural scenery and trees plays an important role of mitigating the effects of global warming through carbon sequestration.

Physical Capital: Impacts are largely evident at community level in well organized communities. Om Prakash, (2003), suggest that forest user groups development activities through community forestry have led to improved village level infrastructure in

Nepal. In Namibia and Zimbabwe marula producer groups now have access to technology and equipment in the form of fruit presses, weighing scales.

Resource management approaches by communities

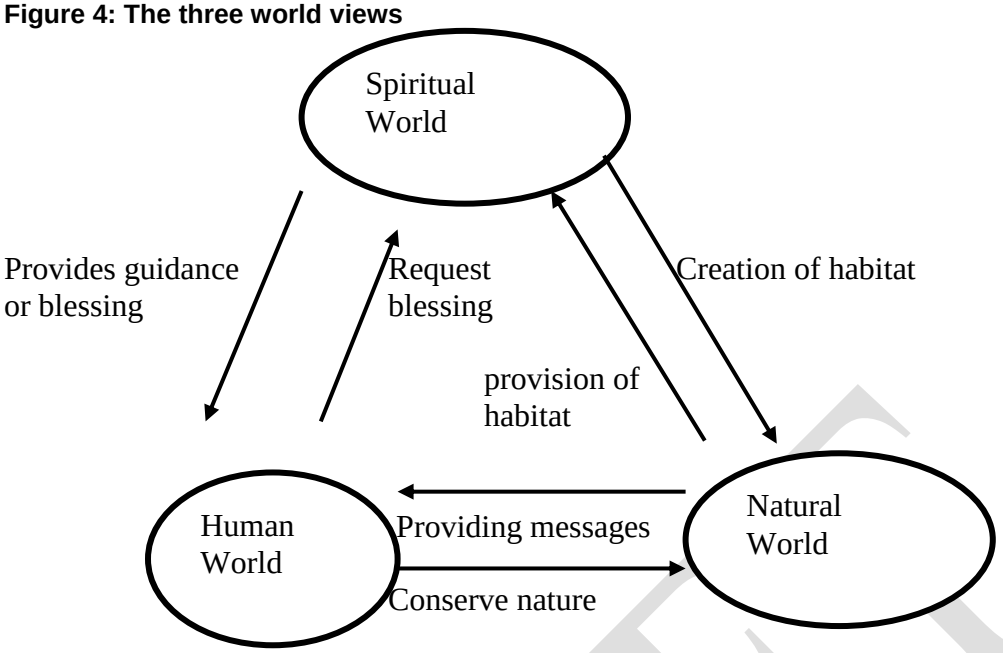
Through-out historical time's communities have long since established systems for resource management as they had realized the importance of these commodities in both their subsistence and cash economies of scale. Kola nuts have a long history of being traded in West Africa as well as fish and bush meat in parts of southern Africa. These trading systems were, however not properly organized and developed compared to modern systems. Various systems or approaches are in place today with some of them borrowing from the old traditional systems to manage resources by local communities. These approaches are varied and there application and use integrated. Below is an outline of these approaches.

i) Taboos and norms

These are the cradle of modern institutions underlining the management of resources be they formal or informal agreements. Taboos and norms largely entails a societal beliefs and norms and guard the behaviour of individuals within a society. Their implementation and functionality largely solely depends on an individual view of point and those who mostly enforce them are local community members as opposed to outsiders in an area. Punishment for not abiding is solely rested in the spiritual world rather than existing local governance structures. For example in Zimbabwe there are scared rivers to whom individuals are not allowed to bath or fetch water from, also there are sacred forests which are out of bound to the general community members. Only local leadership is authorized to enter such forests. Chidhakwa , (2003), suggests that management of the Haroni and Rusitu forests is through *de facto* traditional institutions, rules and regulations that are considered in policy as informal.

Traditional management of forest resources through taboos and norms can best be understood in the context of the African worldview of the relationships between the natural, human and spiritual worlds. Seeland (1997), in Chidhakwa (2003) observes that in the Western world, nature is commonly viewed as being separate from human culture and civilization and as something fragile and to be cared for. To most African and non-western societies such as the Ndau people, however, both nature and culture merge into a reality with material, social and spiritual aspects. It is this amalgamation that affects the way resources are managed and the way people relate to their environments (Chidhakwa, 2003). Figure 4 overleaf is an illustrstion of the close link to the three pillars of African philosophy relating to natural resources management: the human, spiritual and natural worlds.

Figure 4: The three world views



Adopted from Chidhakwa (2003)

However, with the widespread deterioration in traditional values especially among present generations these norms and taboos have greatly suffered. For example once scared forests are now being stripped of their vegetation due to pressure on local resources.

ii) Semi-domestication of indigenous fruit trees

A recent trend in natural resources management by local communities has been the semi-domestication of formerly natural occurring indigenous fruit trees. This trend has been necessitated by the increasing commercial potential of edible wild fruits such as *Parinari curatellifolia, Uaparca kirkiana, Scelocraya birrea, Strychnos occulodes and Adansonia digitata.* This trend, however has not sparred other species which communities have not yet established there commercial potential. For example in Mberengwa Chingoma, ward 26, *Scelocarya birrea* has been largely incorporated into the farming system and where new land is being cleared for cultivation, standing stocks of the resource are left at the expense of other species with the result that parkland systems have been created.

Common dryland tree species used in parkland systems include *Vitellaria paradoxa, Faidherbia albida, Hyphaene thebaica, Balanites aegyptiaca, Sclerocarya birrea, Parkia biglobosa* and *Acacia raddiana* (. Jama, B 2003). Regeneration of these species in an environment of free grazing and declining seed pool is poor and is threatening the sustainability of these age-old systems. Therefore regeneration and rehabilitation techniques of the aging traditional parklands systems, which increase vegetation cover and enrich agroforestry biodiversity, are much needed.

iii) Informal traditional structures and regulations

Kayambazinthu, *et al* notes that traditonal instituional structures and arrangements which may fall within or outside of the state statutes, are the oldest and the traditional chief is at the centre of all user-group rules, sacred controls and civic controls in the area of jurisdiction. These are the centre of all natural resources issues in countries such as Zimbabwe, Malawi and Tanzania. For example in Zimabawe traditonal leadership have assumed control of natural resources through the traditional leadership act and have the power to precid over natural resource management issues in their areas. However, in Zimbabwe in particular full commitment and implementation on the ground has shown that in some areas, the national will has yet to be fully realised to reinforce and strengthen these institutions (Kayambazinthu, D *et al*).

Iv) Commercialization

Natural resource commercialization is the diversification of livelihood options by rural households through sale of products for revenue generation (Chidhakwa. et.al. 2005). Arnold (2004) suggests that commercialisation of non-timber forest products presents an incentive for natural resources management, but may result in serious ecological damage if not properly managed. Against this background, Arnold (2004) noted that there has been increased commercialisation of forest products in Tropical countries.

In these countries commercialisation is a necessity in that without it the market for products is small and the opportunity does not exist for rural people to make money they need to pay for things that will increase their standard of living (Leakey. 1995). NTFP's thus have a place in tropical countries economy for example kernels of bush mango (*Irvingia gabonensis)* are traded throughout Africa with their trade extending from Cameroon to Nigeria, Equatorial Guinea and Gabon. Similarly trade in kola nuts extends from humid zone countries of West Africa into the dry zone where there is big demand by the Muslim community (Leakey.1995). However, very few governments in developing countries are aware of the importance of NTFP in there economies, for example Botswana recently realized that the value of timber exports (USD$15.5 million) was exceeded by the value of NTFP's such as *Uapaca kirkiana* (Mazhanje) and *Gonimbrosia belina* (Mopane worm) estimated to be USD$26 million (Frank. 1995).

Challenges faced in community forest management

Various challenges are facing communities and conservationists in miombo woodland resources in their endevour to conserve what is left of the woodland resources in the face of growing population pressure and incerased poverty statue of the African region. These challenges iclude:

- Lack of shared vision
- Finance
- Technical expertise
- Food insecurity / hunger
- Population increase

Lack of shared vision

Despite contributing much to households in terms of services they offer for example shade, wind breaks, food-edible fruits, honey and bush meat miombo forests management have been largely sidelined in rural economies of scale when compared to agriculture. Observations based on field work in Masvingo province commercialization project by SAFIRE has shown that women are more active participants to natural resources management as compared to men especially for marula (*Sclerocarya birrea)* oil enterprises. Shackleton.et al, (2003) suggests that marula trade in Africa and Namibia is dominated by women with their participation providing them with independent income and stature. Even at continental level in Africa forestry has remained sidelined by agriculture in the debates about poverty alleviation and the subsequent poverty reduction strategies. Assessments of documents derived from NEPAD reveals that forestry does not feature in the premier African development agenda. For NEPAD progress is equated with agricultural development, preferably irrigated agriculture (Campbell et al 2007).

Finance

Despite being concious of the environmental services that forest resources provide rural communities lack the adequate financial back-up to drive locally driven environmental project initiatives. This , however, is not to say that community environmental initiatives should be strongly donor dependant as this will result in failure to achieve intended results and limit community participation. Local communities often have no access to formal credit provision, and interest rates are extremely high for loans provided by local lenders (Schreckenberg et al. 2006). People engaged in forest-based enterprises are often unaware of the availability of credit and means to access it.

Technical expertise

The knowledge base of communities in terms of propagation of indigenous tree resources and improved resource management is some what limited. Sometimes local taboos prohibit the planting of these tree species for example *Uaparca kirkiana* species are believed to attract lightning if planted by an individual. The trees are left to multiply by themselves in Chikarudzo ward 13, Masvingo district. Therefore, in such cases technical expertise by communities to propagate the resource is lacking due to the traditional set up. Although local taboos and norms address the harvesting side of local NTFP they do not extend further to address monitoring of resource extraction an issue very much important on commercialized resources. This presents an area of intervention for NGO's and private sector actors engaged in forestry management to assist rural communities.

Food insecurity and hunger / Poverty

In African rural areas in general there is a large dependence on agriculture to provide food for household and community consumption. Little attention is given to other options such as NTFP production for food security provision. NTFPs despite being looked down upon provide a source for food security for many households both in drought and none-drought conditions unlike agriculture which sometimes faces a drawback during drought periods. Contribution of NTFPs to food security comes through direct consumption such as marula cake, oil and fruit and also through income raised from the sell of these products which comes during periods when households are in critical need of income. For example mopane worms, *Gonimbresia belina*, outbreaks occur during the early

months of the agricultural season when most households have limited grain reserves and therefore have a pressing need for cash to meet immediate consumption needs. This therefore calls for a shift from agricultural dependant rural household economies to those that focus on broad areas of potential like NTFPs production and commercialisation.

Population pressure

Africa has one of the largest population growth rates in the world. This therefore means that an increasing amount of its forests areas are continually being encroached by agricultural production and settlement to support this growing number of people. Coupled with this factor is also the issue of a blind eye turned to NTFPs production system in favour of agricultural which has culminated in drastic degradation of once flourishing natural systems for NTFP production. Increase in search for agricultural land has also culminated in increases in veldt fire as farmer's burn forests areas to clear arable land. This has posed a threat to forest ecosystems on which both humans and nature depends.

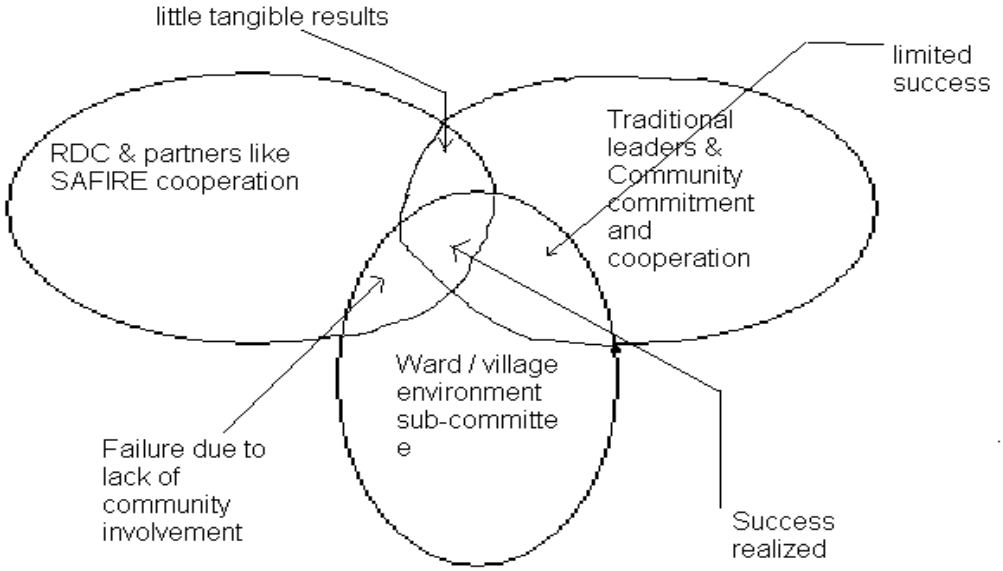
Pivotal / critical elements necessary for successful forest management by local people

Support to traditional institutional structures

Institutions are important in determining how communities utilize and manage their resources as they act as the watch dog of resource utilization for the community. They create and facilitate linkage between grass root environmental initiatives and formal regulatory authorities at Rural district council level. Despite being sidelined for a greater part since independence in Zimbabwe. These traditional structures managed to maintain their existance until government formally recognized them through the enactment of the traditional leadership act in 1999, in which they were made the custodians of natural resources for the community. Their maintainance suggests that they bear a strong hold among community members and are thus important in binding communtiy structures together.

Therefore any attempt to manage resources at communtiy level should take into account these traditonal structures and further enhence and stregthen their existance as they are the centre points for community organization. Morden instituions in resource management should be supported by these traditional structures as they are the ones in direct contact with the community. Any modification to the system should try to maintain the traditional institutional structures authority in natural resources. Support to these structures could include stregthening and capacity building in terms of community based approach principles and practices. Figure 5 overleaf is a model of harnessing traditional instituional structures and mordern instituions such as ward level environmental committees and the rural district council. These should exists as part of an intergrated system as each formation depends on the other for existance and proper carring out of it's duties.

Figure 5: Proposed model for sustainable institutional approach to community resource management



Modified from Akinnifesi et al: 2006

Knowledge based support systems to communities on propagation and in-situ management of forest resources

Communties should be supported in terms of propagation and improved management of local wild resources. Local knowledge on propagation of indigenous trees should be embraced into these educational programmes and improved if need be to support resource management. For example the case of Uapaca kirkiana in chikarudzo, Masvingo district. This tree is not planted as there are fears that it attracts lightning. The tree is left to grow on its own a factor which is favourable under no or little commercialisation, unlike the present situation in the ward. Schreckenberg, K and Marshall, E, (2006) suggests that various factors determines the level of domestication and propagation of an NTFP product by a community as illustrated overleaf in table 1.

Table 1: Factors determining the level of domestication for NTFP products

Factor determining domestication	Description
Biological characteristics	Reproductive and growth potential of a resource for example mushrooms may be difficult to propagate as compared to tree species as they grow as mycorrhizal fungi.
Tenure characteristics	Land ownership system in place within a particular community. People invest in long term initiatives on properties which they feel are theirs e.g planting of *Uapaca kirkiana* species on individual plots.
Opportunity cost of collection versus production	Despite being a costly exercise for rural households, domestication and propagtion of NTFP products has recently become an important aspect of their lives as growing population pressure and need for agricultural land is becoming evident
Legislation	Supportive legislation that acknowlege the role of NTFPs
Society traditional knowledge, culture and management capacity	Capacity of a community to propagate wild resources and taboos and norms in existance
Technical and organizational capacity	Research and technical expertise availabilty within a country

Supportive legislative backing

Pieces of legislation regarding natural resources within a country represents the ability of a community to utilize it's resources without depleting the resource base. Laws that regard the community as poachers of resource encorage degradation as was witnessed during the colonial period in Zimbabwe. Depite having made a stepping stone towards achieving devolution of power to local communities what is needed is an appreciation of NTFPs as one of the cash income generating activities within the country. At continental scale this is also very much evident as forestry has remained sidelined by agriculture in the debates about poverty alleviation and the subsequent poverty reduction strategies. Assessments of documents derived from NEPAD reveals that forestry does not feature in the premier African development agenda. For NEPAD progress is equated with agricultural development, preferably irrigated agriculture (Campbell et al 2007).

Changes in land tenure systems

Tenure regimes influence how a resource is managed as suggested by Schreckenberg, K and Marshall, E, (2006). Three basic categories exist for resource management and these are illuatrated in table 2 ovearleaf.

Table 2: Land tenure systems in forest management

Type of tenure	**Description**
Open access	Nobody has control over the resource and anybody can harvest at will. This situation typically arises where the legal status of land is uncertain or has changed, and nobody takes responsibility for, or has the where withal to enforce, systematic resource management.
Communal land	Community owned land with the Rural disrict council having the overall custodian as defined in the Rural district council act. Opprtunity exists for management with support from government, private and NGOs
Individual land	Private owned property, however if important resource exists in close proximity to a communal area that are of vital use sharing mechanisms shoud be agreed upon to prevent issues of illegal harvesting e.g the CAMPFIRE approach

Demonstrating value for miombo woodlands

Communties are more enclined to agricultural production than NTFPs production and commercialisation because agriculture managed to demonstrate tangible benefits able to meet household economies of scale. The same is needed for NTFPs interventions. Value for miombo woodlands is demonstrated by further improving natural products that people are acustomed to so as to bring a mindset of importance to natural forests. This opportunity exists as recent forest research has indicated that a number of products can be made from natural NFTP products for example edible marula oil from marula fruit, oil from *parinari* kernels, jams from *Uapaca kirkiana* and honey. These products are very nutritiuos and contribute emensely to household food security, income generation and nutrition. Plate 1 below illustrates community members displaying edible marula cake and oil in one of SAFIRE operational areas in Masvingo district, Zimbabwe.

Plate 1: Community members holding marula cake and oil

Ensuring equitable distribution of accruing community benefits at the local level

Benefits from NTFP production and commercialization efforts need to be cuscaded to the people who are the owners of the resources, for example marula oil has export markets which represent a potential income source for communities. Mopane worms are also intensely marketed during and off season periods generating income which is very crucial as it comes early during the agricultural season and meets basic consumption

and other expenditure needs in the districts of Mwenezi and Bubi, Masvingo province. To achieve this communties need proper organizational models that facilitate the channeling of shares or accruing community benefits based on costs bearing status. Communities are the ones that largely bear the management costs of resources and should therefore be accorded equal basis on sharing of benefits. This is being addressed through natural products networks in Southern Africa such as Phytotrade Africa.

Conclusion

This paper although not an exhaustive thorough study looked at aspects affecting community based resource management in SAFIRE projects areas and tried to relate this to relevent literature on natural resource commercialisation. Conclusions drawn show that communities are affected by a broad range of factors in their ability to realize maximum benefits from NTFP commercialization which include lack of technical knowledge on indigenous tree propagation, institutional impediments, unequal benefit sharing mechanisms and land tenure issues.

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