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An Overview of Local People's Livelihood and Biodiversity Conservation in Maladumba Lake and Forest Reserve (MLFR) Bauchi, Nigeria

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Abstract: Researchers review the indigenous knowledge of communities in MLFR and how this has helped in biodiversity conservation. Indigenous and local communities live in areas where substantial biodiversity resources are found and have made remarkable contributions to its sustainable conservation. They have used the resources for thousands of years and their cultures and knowledge are deeply rooted in the environment on which they depend. The Global Environment Facility (GEF) has been working closely with local communities since its inception, recognizing that effective public involvement of local communities is critical to the success of its projects. The Convention on Biological Diversity (CBD) also emphasizes the importance of working with indigenous peoples to respect, preserve and maintain traditional knowledge relevant for the conservation and sustainable use of biodiversity. Successful implementation of conservation projects affecting local communities can be guaranteed on a long-term basis only when there is consent from and collaboration with the communities.

Key words: Resources, communities, sustainable use, global environment facility, conservation, Nigeria

INTRODUCTION

Maladumba lake and Forest reserve is located in Misau local government area of Bauchi State. It is centred on latitude 10°05'N and longitude 10°05'E. The climate is generally described as tropical with warm and humid conditions. There are two distinct seasons, namely rainy season which lasts for about 5 months (early May to early October) with the prevalence of moisture laden South-Westerly wind during the wet months and dry season which lasts for the remaining period of the year which are associated with the dust-laden North-Easterly wind. Like most parts of Nigeria, MLFR enjoys the characteristic West African monsoonal climate, marked by distinct seasonal shift in the wind pattern. In the study area, temperature is generally high most of the year; ranging between 27° and 33°C except during the cold and dry months of November and January. The hottest months in the area are February to early May. The topography of the area is typical inselberg landscape. The reserve lies at the Southwestern edge of the Chad Basin and the Eastern edge of Jos Plateau. Apart from the inselbergs, exposed rock sediments are very prominent in the area. The highest parts of the reserve are to the West and Southwest areas with an altitude of about 1,100 m above sea level while the lowest elevation is near the confluence of River Delimi and River Gau. River Delimi is the main drainage in the reserve. It takes its source from the Eastern steep slopes of Jos Plateau and flows from Northwest to Northeast direction towards the Chad Basin. River Delimi has a lot of tributaries which form a dense network of streams. MLFR is underlain by old crystalline metamorphic rocks of pre-Cambrian asement complex formation.

Most of the area is covered with undifferentiated igneous and metamorphic rocks. There are intrusions of granites in the Western part of the reserve. These intrusions represent younger grainite suites of Jurassic age. Rocks in the reserve are thinly weathered thus leaving wide areas of hard rock outcrops. Soils in MLFR are rich but relatively shallow. They are sandy, sandy clay and loamy soils developed on shallow basement hard granitic rocks. The soils also contain stones, pebbles and even rock boulders.

MLFR falls within the Sudan savanna vegetation zone of Nigeria. The vegetation of the area is dominated by the following leguminous species: *Acacia* sp., *Burkea africana*, *Annogeisus africana*, *Tamarindus africana*, *Balanites aegyptica*, *Strychnos spinosis*, *Prosopsis africana*, *Monoter kersterigic*, *Diospyros mespiliformis* and *Adansonia digitata* (Abdullahi and Ibrahim, 2008). Around the lake, the vegetation has been degraded due to incessant cultivation and grazing thus resulting in large areas dominated by shrubs and grasses. In terms of faunal characteristics, the wildlife composition in MLFR include *Alcelaphus buselaphus* (Hartebeest), *Ourebia ourebia*

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(Oribi) and *Erythrocebus patas* (Patas monkey) which are all associated with wooded savanna. The area is also known to serve as habitat to *Tragelaphus scriptus* (Bush buck), *Phacochoerus aethiopicus* (Warthog), *Crocuta crocuta* (Spotted hyena) and *Papio anubis* (Olive baboon) (Abdullahi *et al*., 2008). In addition, reptiles such as rock phyton, spitting cobra, puffer adder, green snake and monitor lizard are also common in the area. The bird species include wood bark piper, red shank, spotted red shank and cattle egret.

A BRIEF HISTORY OF BIOLOGICAL RESOURCES CONSERVATION

The establishment of protected areas is a key part of the ongoing global efforts to conserve biological diversity. The idea for biodiversity conserving and enhancement at the international levels dates back to 18th century (Panel on the Ecological Integrity of Canada's National Parks, 2000). Locally such initiatives can be found several centuries back, especially with the establishment of the country's premier game reserve, the Yankari in 1956 (North Eastern State Nigeria, 1973). The ecology first approach dominated all conservation efforts up to 1985 where management aim was largely conservation (Pimbert and Pretty, 1995). The proponents of this approach view local communities' welfare and development as directly conflicting with the objectives and practice of biodiversity conservation and seek strong mechanisms to safeguard protected areas (McNeely, 1988). Since, 1985 more participatory approaches have developed with shifts in focus from conservation to sustainable resource use (McNeely, 1988; Shrestha and Alavalapati, 2006). Supporters of this participatory option referred to as people included looked at biodiversity management as a creative synergies between the integrity of ecosystems and the livelihoods of people living and working in and near those ecosystems (Stool-Kleemann, 2001). The goal of this approach is to maintain relies on empathetic local management (Vedeld, 2002). This perspective considers the relationships among evolving species and habitats, human uses and ecological awareness to find ways to address the biodiversity problem. This approach has been tried out in various forms in different context and countries over the last two decades with very varying degrees of successes (Stool-Kleemann and O'riordan, 2002).

Protected areas based this on approach are likely to be increasingly important in coming years as the key role of local and indigenous cultures is being gradually recognized. It is important however, not to over-idealize local peoples and their resource management strategies and stewardship skills. Acknowledgement of the positive links between local peoples and biodiversity has been increasingly tempered by the recognition that under certain circumstances local peoples can act as disruptive agents. Biological diversity and sustainable development are today two of the most powerful and central concepts in environmental protection (Harrisson, 1993). In recent years, special attention is being paid to the sustainable development of community-based peoples as a key mechanism for the reinforcement of correct participation of local communities in biodiversity conservation. It is possible to define sustainable community development as an endogenous mechanism that allows a local society to take (or retake) control of the processes that affect it (Harrisson, 1993). In other words, self-determination and local empowerment, conceived as a taking of control have to be the central objectives in all community development. Simply put its entails movement from substance to process (Vedeld, 2002). Given the demostrated importance of indigenous peoples for biodiversity conservation, it is essential to recognize the necessity of empowering local communities. That is to maintain, reinforce or give control to the indigenous communities on their own territories and natural resources as well as sufficient access to information and technology. Important here are legally recognized and enforceable rights to lands and waters which give the communities both an economic incentive and a legal basis for stewardship. In many communities policy support for existing community-based property rights systems are crucial. Returning a measure of control over public lands and resources to local communities is also fundamental to slowing biodiversity loss in all communities. Similarly, it is very important to establish new resource-management partnerships between local communities and the state and other society institutions to maintain biodiversity (Myers, 1990). Local stewardship in conjunction with external governmental and non-governmental agencies and institutions is perhaps the best way to guarantee effective protection of landscapes, habitats, species and genes worldwide and especially in tropical countries.

THE VALUES OF BIOLOGICAL RESOURCES AND THE BIOLOGICAL RICHNESS OF THE RESERVE

Biological resources have diversity and abundance attributes that provide a range of goods and services of benefit to people and it is these goods and services that drive anthropocentric arguments for conservation (Grimble and Laidlaw, 2002). According to Myers (1993) in economic analyses these goods and services can generally be divided into use and non-use values. Use

values can in turn be subdivided into direct, i.e., the physical goods used by people (such as food, fuel, timber and herbal medicines) or aesthetic or recreational benefits obtained and indirect, i.e., the ecological functions that maintain the stability and productivity of the environment at local and global scales. These include pollination functions performed by insects and bees and contributions to nutrient cycling and fertility maintenance by soil organisms (Humphries *et al*., 1995). At a wider level, trees and scrub vegetation contribute to environmental services such as soil conservation and hydrological protection and more widely still, to regional (or global) climatic regulation (Noss, 1990). The major non-use values are option and existence values. The former relate to potential future uses such as the availability of plant material for breeding or the possible discovery of new medicines whilst the latter refer to the values placed on the continued existence and survival of rare and threatened species and ecosystems (Grimble and Laidlaw, 2002). The reserve proudly treasures some of the largest and most intact extant of natural forests which harbour a variety of altitudinal climax forest communities. The lake is representative of the natural wetlands of the Sudan savanna in Nigeria. The wetland has a unique assemblage of plant and animal species that are important for the maintenance of biological diversity. It supports a large number of migrant bird species such as the grey heron, white-necked stork and green fruit pigeon, etc. The lake has a high diversity of fish species and thus plays an important role as a source of protein for the local population and enhances the local economy. Agriculture, grazing, hunting and recreation are also practiced by the surrounding population and rapid siltation is a growing threat. MLFR is one of the most important Ramsar wetland sites in Nigeria, located in the Sudan climatic zone and is a priority area for conservation of its rich diversity, both in terms of species richness and endemism. The reserve area forms an important catchment for Rivers Jamaare and Dingaye. Because of its tropical location and high vegetation density, the reserve provides habitat for a very rich variety of wildlife including other carnivores, primates, ungulates, small mammals, birds, reptiles, amphibians and many other life forms. A pioneering effort in involving local people in conservation has been in progress since, 2004 in the reserve. Attempts are being made by educating, motivating and involving people under the LEEMP with the aim of reducing the dependency of local people on the resources of the reserve leading to improvement of the livelihood conditions of the people, habitat, watershed development and overall conservation.

PRESSURES ON THE BIOLOGICAL RESOURCES AND THE CURRENT INTEGRATIVE APPROACHES

The MLFR has human and cattle population in many villages and small and moderately large townships. The ever increasing human and livestock population, especially cattle at MLFR has resulted in increased pressure of utilization on the biological resources. Therefore, the forest resources of the reserve experience moderate to marginally high pressures by way of cattle grazing, cutting and removal of firewood, small and large timbers, collection of non-timber forest products and occasional poaching of prey animals. This biotic interference also makes the forest prone to fires during dry season which extend over a larger period along the dry zone areas of the reserve surrounding these habitations. Fishing activities in the lake is another major interference to the protected area resource. About 40 villages/hamlets comprising about 10,000 households with human population of about 100,000 lie within the 5 km radius of the boundary of the reserve. These peripheral villages mostly practice rain fed agriculture which is usually their single most important source of livelihood. The villages also face annual problems of crop damage mainly from Fulani transhumance activities around November/ December. A number of different strategies for integrating longer-term environmental and developmental goals have recently been developed (World Bank, 1996). This new architecture of aid aims to integrate poverty, environmental and economic growth policies into developmental frameworks and strategies owned and operated at country-level (World Bank, 1996). It builds on earlier developments in participatory methodologies and involvement of local stakeholders in the design and management of programmes and projects at a local community level (Grimble and Laidlaw, 2002). This builds on progress in the mitigation and management of conflicts arising from resource scarcity and need. Encapsulating such initiatives are separate advances in sustainable livelihoods and ecosystem management that aim to balance social, economic and environmental objectives (Myers, 1993). These approaches represent a converging of development and conservation ideals, both following a systems and multisectoral integrative approach. The current challenge is to find ways to operationalise this new design in ways that represent the interests of multiple stakeholders at all levels and reducing areas of conflicts of interest between stakeholder groups.

The challenge is therefore, considerable, implying the need for appreciation of numerous people-ecosystem interactions and locally variable barriers. It also implies an

understanding of the economic values of ecosystem goods and services and the difficulties of assigning and utilizing these values in practice.

INVOLVING LOCAL PEOPLE IN CONSERVATION

It cannot be denied that the MLFR and majority of PAs in Nigeria have local communities around them who depend on the resources of the PA for sustenance and even livelihood. The consultative processes involving local people while declaring the PAs and subsequent regulation and restriction of resource use were generally found missing (Abdullahi *et al*., 2008). Locals residing in and around PAs feel neglected and lack of awareness about the efforts being made and the need and urgency of such efforts towards conservation and wildlife protection makes it difficult to appreciate PA managers (Vedeld, 2002). This is one important reason that makes conflict resolution between the PA authorities and the local people very difficult. The PA authorities have failed to a great extent in seriously attempting the involvement of local people in conservation planning and management taking their concerns into mind and trying to solve the issues through better management options derived through consultations and consensus building (Grimble and Laidlaw, 2002). The ongoing debate about the justification, planning and management of PAs between wildlife conservationists and human rights advocates overlooks the fact that both wildlife and local communities are today equally threatened. Reconciliation between the two is possible if local communities and government agencies evolve a partnership in conserving the habitats with critical support from all of us. The PAs constituted under the provisions of the Wildlife Protection Act restrict activities which are detrimental to the PA and its ecosystems. Human habitations, grazing and other resource exploitation activities are prohibited in the PAs whereas grazing and continuance of some rights by local people may be permitted if these are not detrimental to conservation (Grimble and Laidlaw, 2002).

However, only about 11% of the total land area of the country is under PA system and in many cases the areas do not have the capacity to allow resource extraction and restrictions imposed are the control mechanisms making way for conservation of genetic resources. Keeping these views in mind, the efforts to involve local people in conservation activities are visualized and planned to reduce resource dependency by them on the PA resources. Providing assistance to people depending on the PA resources for livelihood is a major concern in this approach. Since, the exploitation of resources is not the recommended action the concept of resource sharing as followed in many management approaches is not highlighted and followed in approaches designed to seek local people's participation and involvement in conservation programmes (Vedeld, 2002). A new concept of eco development approach has now been followed since, 1980s in many PAs and the experience gained and the results obtained are significant, positive and encouraging in many parts of the world. McNeely (1988) defined eco-development as a site-specific package of measures derived through people's participation which addresses all aspects of land use and other resources in order to promote sustainable land use practices as well as off-farm income generating activities which are not deleterious to PA values. The Federal Government through the LEEMP has attempted to develop a package of programmes that will demonstrate the concerns of the PA management for the socio-economic development of the fringe or buffer zone villages and will result in greater co-operation of the residents of the communities in the conservation and management of wildlife (Abdullahi, 2008). Keeping these objectives in mind the government of has been assisting implementation of eco-development activities in and around PAs across the country for the past several years. The initiative has made the PA authorities assist the local people and seek their co-operation and support in conservation activities. However, in majority of cases no formal tie-ups were made with the PA authorities and the local people in these efforts.

INITIATIVES ATTEMPTED IN MLFR

A pioneering attempt aimed at conservation of biodiversity through improved PA management was initiated by the FGN in 2002 as a pilot project involving local people in conservation. This was immediately followed by the 5 years Global Environment Facility (GEF) project (2004-2009) with an outlay of $500,000.00 each year envisaged to generate vital experience and information on causes, concerns and outcome of local people's involvement in conservation of biodiversity (Abdullahi, 2008). The project which is a component of the Local Empowerment and Environmental Management Project (LEEMP) is assisted by the World Bank. It is designed to establish an institutional mechanism for transferring investment resources to communities in order to enable them finance their own developmental priorities. It also emphasizes the sustainable management of the environment as a pre-requisite to sustainable livelihood and development (Abdullahi, 2008). The project is anchored on community driven approaches to

development which entails that communities prioritize their own development needs through a participatory process with assistance from Multi-sectoral facilitation Team (MIT). The resulting priorities would revolve around pure public goods (schools, health centres, feeder roads and portable water), impure public goods (soil erosion control and soil conservation, etc.) and alternative income generating schemes (Abdullahi, 2008). The project would use matching grants to encourage already existing mechanisms within communities to enhance their development (World Bank, 1996). The project has two inter-related development targets viz: beneficiaries to plan, co-finance, implement and continue to operate and maintain environmentally sustainable and socially inclusive multi-sectoral micro-projects, to strengthen the institutional framework for supporting environmentally sustainable and socially inclusive development at federal, state and local government levels. The programme was designed to ensure that all stakeholders of the beneficiary communities possess a sense of belonging and contribute towards the success of the project during and after implementation. Specific objectives include: to establish committed grass root level organizations concerned with conservation by educating, motivating and involving local people in the intervened communities (Abdullahi, 2008).

To achieve reduction in resource dependency on resources of the reserve and thus lead to habitat improvement and conservation. This is being achieved by providing alternate income generation activities to PA resource dependents in the community and improving their skills and knowledge for the new way of living; developing suitable biomass in and around the target villages (firewood, fodder, small timber and fruit trees and other alternative income generation activities) and encouraging reduction in the use of firewood, increasing the efficiency of energy use, motivating people to use alternate energy materials and methods.

To create awareness about the value of the reserve and the need to conserve it among the target villages using different media (folk arts, audio-visual, posters and brochures).

To enhance the capacity among local people in needed skills and knowledge by way of organizing training courses, workshops and field visits. The important steps to achieve the project initiative and objectives have been the following: developing a relationship with local people so that the ideas and efforts that follow later are appreciated and the desired flow of information and involvement is achieved. Preliminary activities (like repair of a community road, providing drinking water facility and improving a community structure, etc.) are taken up in order to develop credibility and to receive better support from the local people.

On achieving the desired level of understanding, the Local Government Review Committee (LGRC) representative, the Multisectoral Implementation Team (MIT) and local community members sit together and facilitate enrolling the members and establishing a local grass root organization, i.e., CPMC. Membership is open to all members of intervened community. The members then select seven executive members and sub committees who hold the position for 2 years. The team then takes up the Participatory Rural Appraisal (PRA) and other information collection work in the target communities. The negative and positive interactions between the reserve and the people are analysed and possible combat strategies discussed, identified and finalized in active consultation with the local people.

Based on the active consultation and information collected, a Community Development Plan (CDP) with fundable micro-projects is prepared in the local language and approved. The CDP contains three major components viz., provision for simple social infrastructure in and around the target community; alternate sources of energy and alternate off season employment opportunities.

UNIQUENESS IN THE APPROACH

Certain new initiatives have been taken for the first time under the project. The salient features of these initiatives can be summarized as follows: the CPMC is a registered association with the local government and thus become a statutory body attracting the provision and support of all stakeholders.

The various community development activities as envisaged in the CDP are implemented by the CPMC. The project staff and the consultant (MIT) act as facilitators for the CDP implementation. The project's decision in this regard to permit disbursement of funds to CPMCs for implementing the micro-plan is historical and forms the beginning of the paradigm shift in resource control. The funds for implementing the CDP activities are released to the account of the CPMC held by the CPMC chairman, treasurer and the financial secretary.

No activity carried out under the project is absolutely free. The community members contribute 10% or even more of the cost of all activities. The contribution many a times comes in the form of kind if not in cash. This brings a sense of attachment to the activities carried out under the project.

All assistance provided under the project to identified beneficiaries through the project under alternate employment generation works is to be recovered and

revolved so that other members benefits too. These funds are managed by the CPMC as a revolving fund making the CPMCs to provide assistance to local people on a sustainable basis.

To ensure transparency, funds are released from CPMC account only with the approval of a two third majority of community members and all information business transactions are weekly displayed for community observation, comments and queries if there's any.

The efforts made so far have shown positive results and in general a strong partnership has been molded among CPMC members, MIT, LGRC and project staff. Participating communities have developed a keen sense of ownership of the micro-project activities and are being equipped with organizational, technical and financial skills needed to continue and sustain these initiatives. The project now stands good chances of survival if the local government will continue to provide oversight through the LGRC as required in the project set up. This is still to come. Therefore, for sustainability, the intervening agency need rebuild the existing capacity so that both the government and the local communities could come to be on the same page.

CONCLUSION

The initial line of experience gained through project initiatives in the reserve has provided an opportunity to the reserve authorities to seek local people's participation towards reducing resource dependency and thus getting the local people involved in conservation efforts, leading to habitat improvement and providing an opportunity for the biodiversity of the reserve to improve. The project may not work as a panacea for all conservation problems yet as a process it has had a successful start in MLFR and with continued sincere efforts may eventually further intensify the involvement of local people in being partners in the PA management.

The project activities have potential to support people's participation and to provide assistance to local people who depend on forests for livelihood and other basic needs. Strict compliance and regulation of the acts and rules and policing the PA will have to continue to tackle the damages caused and pressures imposed on the resources by habitual resource extractors and wildlife poachers who primarily satisfy their greed for money and other materialistic benefits at the cost of the natural resources. A collaborative bond has been forged among the reserve authorities, MIT and participating communities to conserve MLFR's biodiversity and improve the grass root economy.

The efforts made so far have been appreciated and the project initiative in MLFR has been found to have potential to become a successful model in biodiversity conservation at various levels. The long-term success of these efforts will depend on sustaining the quality of the relationship between the local communities and the reserve authorities. Thus, it is assured due to the sense of belonging to the natural treasures of MLFR which is now in place in the community and should endure in its progeny.

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