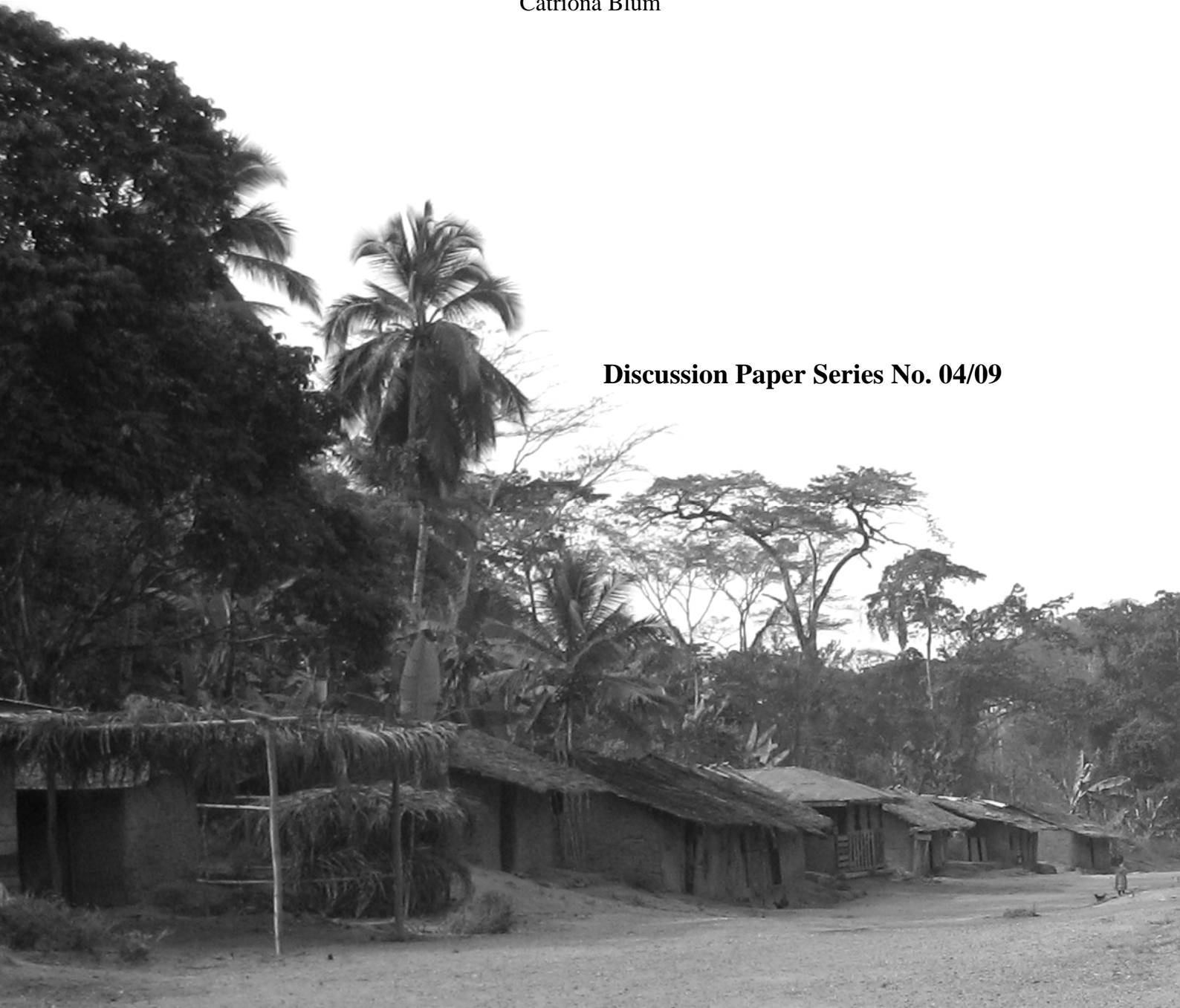

DISCUSSION PAPER SERIES

**Managing Forest Wildlife for Human Livelihoods in
the Korup-Oban Hills region, West-Central Africa**

Community-based wildlife management models:
A joint vision for future protection of wildlife
and rural livelihoods

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Abstract: The Community-based wildlife management (CWM) approach to conservation of wildlife in the tropics has long been proposed as an effective and ethical way of integrating conservation goals with the aspirations of the rural poor. This paper reviews first the theoretical background of CWM, and continues with a discussion of specific cases studies and strategies employed primarily in West and Central Africa.

Keywords: integrated conservation and development, community-based wildlife management, CAMPFIRE, bushmeat crisis, poaching, participatory project management

1. Introduction

1.1 Introduction to Community-based wildlife management

Community-based wildlife management (CWM) is seen as the ‘right’ approach to conservation, and it was defined by Roe & Jack (2001) as ‘*the regulated use of wildlife populations and ecosystems by local stakeholders*’, where local stakeholders “*may be a village, or group of villages; an individual, or group of individuals with a shared interest in the resource*”. The important premises of the CWM approach is that stewardship over wildlife resides at the local rather than the state level, and that it is possible to improve rural livelihoods, conserve the environment and promote economic growth at the same time (Roe, 2001).

In the past, protected areas represented islands managed in isolation from the surrounding areas and human activity. The traditional models of wildlife management favoured the exclusion of users from the resource, imposing restrictions, and resettling people outside protected areas (Brown, 1999; Roe, 2001; Owono, 2001). This paternalistic, top-down approach, took little consideration of social or economic consequences (see IIED, 1994 for examples) and exclusion gave communities little incentive to manage wildlife sustainably. At the Earth Summit of Rio in 1992, it was concluded that there can be no conservation without development, and that sustainability also implies sustainable livelihoods (Brown, 1998). Increasingly, it was becoming more widely accepted that excluding people from their traditional livelihoods was neither realistic nor ethical (Metcalf, 1993; Sutherland, 2000; Olsen 2001; Brown 2003).

A common aspect of rural livelihoods in many developing countries is the reliance of people on bushmeat (hunted wild animals) both for their protein intake and as a source of income (Brown et al., 1999; Hakimzumwami, 2000; Egbe, 2001; Asibey & Child, 2002; Brown, 2003; De Merode et al., 2003; Cowlshaw, 2004; Hoyt, 2004; Pailler, 2005). It became increasingly more apparent that excluding traditional users from their wildlife resources was often no longer a viable, realistic or acceptable management option. Instead, it was decided that ways had to be found to integrate livelihood resource use patterns with the conservation objectives of a locality (Brown, 1998; Brown, 2003). In fact, several studies suggested that community based wildlife management is most effective when all traditional resource users were involved in management and planning, thus enhancing their rights to the resource, improving their

livelihoods, considering their needs, encouraging interactive communication and strengthening local institutional capacity (Metcalf, 1993; Brown, 1998; Brown et al., 1999; Sutherland, 2000; Hakimzumwami, 2000; Roe et al., 2000; Olsen et al., 2001; Roe & Jack, 2001; Roe, 2001; Mbile et al., 2005). Nevertheless, trade-offs are inevitable and there is a need for balance between protection and sustainable use (Olsen et al., 2001).

There was a general call to move away from the traditional *biodiversity preservation* approach to nature conservation and adopt instead a *conservation of resource biodiversity* approach (Brown, 1998), emphasising the need for sustainable management of biodiversity in support of human needs (Brown, 1998). If a wildlife management programme is to be effective in the long term, it must be based on the active involvement and participation of local people, and provide them with significant and sustainable benefits in terms of both food and income (Asibey & Child, 2002).

1.2 Why are management models important?

The creation of a good management model is vital for effective and efficient protected area and species management. Yet, Knight et al (2005) stress the fact that implementation of effective conservation action is far less developed than systematic assessment techniques. We often have enough information on priorities for conservation but fail to understand how to actually implement conservation actions, i.e. how to collaborate with stakeholders and how to maintain or enhance a continued flow of benefits to local people (Knight et al., 2005; Cowling & Wilhelm-Rechmann, 2007). With regard to the bushmeat trade research priorities have been identified (see Bowen-Jones, 2002 for details) and we know much more about the ‘where’, than the ‘how’ of conservation (Cowling & Wilhelm-Rechmann, 2007). We are weak on the practicalities of how to apply ‘communities’, ‘wildlife’ and ‘management’ to the realities of the bushmeat trade and livelihood issues (Roe, 2001; Brown, 2003). Thus, there is an urgent need for effective ‘operational models’ (Knight et al., 2005) which include empowering individuals and institutions (enabling) and explicitly aim to secure conservation action (implementation). *‘It is time to deliver on-ground conservation action and to get involved with political and socio-economic challenges, where conservation actually takes place’* (Knight et al., 2005).

Brown (2003) quite dramatically stated that “the existing bushmeat management systems in tropical Africa can usually be described in simple terms. In most situations they are non-existent”.

1.3 The building blocks of CWM models

There are several ways to link conservation with development in management models. One is to identify *alternative resources* to replace existing strategies; the other is to *derive benefits from conservation* as a ‘motor for development’ (Brown, 1998). The later can be divided into a) generating *tourist revenues* and b) devise management strategies for the *enhancement of local livelihoods* (Brown, 1998).

Alternatives to damaging exploitation

Alternative income generating strategies have been particularly favoured among conservation agencies (Brown, 2003), since these are thought to reduce pressure on forest wildlife. Any alternative has to offer superior benefits to the resource users and would have to be a real alternative rather than a meagre supplement (Sutherland, 2000). Alternatives which have typically been promoted, especially in recent years, are livestock-rearing schemes (Mockrin et al., 2005) or captive breeding of wild species (see Rushton et al., 2004). Mockrin et al. (2005) suggest that wildlife farming for meat production is not economically viable compared to hunting or to farming domestic species, and also poses several conservation threats (Mockrin et al., 2005). Wildlife farming cannot compete with hunting as long as wild animals are abundant, especially since hunting is a livelihood opportunity that has low entry costs (Brown, 2003). Particularly for tropical forests there has been little success in discovering alternative resources (Brown, 2003). The difficulties of alternative income-generating schemes are dealt with by Brown (1998) (see Box 1) in some detail.

Benefits from conservation

Conservation tourism

The redistribution of tourist revenue has also been proposed as a solution to the bushmeat crisis. The problems related to tourism (Reynolds & Braithwaite, 2001) and whether this is at all a viable option for tropical forest CWM models will be discussed in a later section.

Enhanced livelihoods approach

An alternative model is to ‘employ’ local communities as active managers of their resource biodiversity (Brown, 1998) and thus to enhance local livelihoods. In order to devise an innovative and effective forest CWM model it is necessary to identify what types of approaches have been used in community based wildlife management so far, and what we can learn from past mistakes.

One of the first projects to adopt this approach was the Mount Cameroon Project (MCP) based in Limbe, Cameroon (funded by DFID and the Government of Cameroon). It pioneered the ‘*enhanced livelihood approach*’ building on locally-expressed values and people’s strengths, rather than their needs (Brown, 1998). This entailed working with local communities to develop a viable model for participatory and sustainable wildlife management which should increase the capacity of users and other stakeholders to manage resources sustainably in the future. The model is based on the experience of two wildlife management groups; the Mokoko Wildlife Management Association (MWMA) and the West Coast Regional Wildlife Committees (WMCs). The development of the current strategy under implementation took 8 years of participatory work (1994-2002) (Akumsi, 2003). Specifically, in response to an increasing decline of wildlife populations due to over-hunting and agricultural encroachment into forested areas (either small scale or plantation crops), the MCP introduced ways of controlling hunting practices through issuing of hunting license, imposing sanctions to transgressors, and establishing, allocating and monitoring hunting quotas. In this way, the local population was able to improve the management of an once practically uncontrollable natural resource, in a way that was locally sensitive and acceptable. The biggest challenge however has been the establishment of ecologically realistic and implementable hunting quotas. The following section discusses briefly the issues arising from this challenge.

1.4 Developing sustainable hunting quotas

The main barriers to the management of the wildlife in tropical rainforests is the inherent difficulty of establishing hunting quotas in a setting where there has been traditionally no functioning wildlife management schemes and only limited understanding of the natural history of targeted species (Brown, 1998; Robinson & Bodmer, 1999). What is especially lacking is accurate and long-term monitoring of harvests to determine the success of management initiatives and to allow more

adaptive responses by managers. A total ban on hunting is not a realistic option, as it would alienate hunters and bushmeat consumers, driving the trade totally underground, where it would be uncontrollable. Olsen et al (2001) suggest using a combination of both, simulated estimates and ‘real data’ to agree on off-take quotas for species. It may also be helpful to combine local knowledge with monitored population dynamics in the decision making process.

Allocation of sustainable hunting quotas

Mokoko has developed a system whereby the quota for each species is divided between villages. Village committees are responsible for distributing the quota between individual hunters (Olsen et al., 2001). Individual quotas are allocated to hunters in the form of metal tags, which are to be attached to every kill, thereby making the kill legal. Pepper soup sellers are to record the tag and send it back to the central committee (Olsen et al., 2001). The bushmeat trade supplies both subsistence needs and commercial markets, with complex commodity chains leading to big cities and even across national borders (Millner-Gulland, 2002; Cowlshaw et al., 2004). The creation of a hunters’ GIC (Groupe d’ Initiative Commune = a legal entity for a small group of people with a communal interest), as in the MCP case, can assure control of the whole chain from the snare to the market place (Van der Wal & Djoh, 2001). Cowlshaw et al. (2004) agree that the most effective way to manage the complex system surrounding bushmeat is to incorporate all actor groups of the commodity chain (hunters, wholesalers, market traders, chopbars and consumers) (see Appendix 1).

In addition to the GIC, the MCP has put several agreements in place to ensure more sustainable off-take: Less common and slow breeding species should be hunted at a lower density. But if the populations of the common and fast-breeding species increase, hunting quotas should also increase (Olsen et al., 2001). Moreover, animals which are illegal to hunt, such as drills and chimpanzees, must become valuable through other direct benefits of management i.e. support to managers from a Conservation Foundation and sharing of monitoring data with interested Bio-monitoring Initiatives (Olsen et al., 2001). The MCP provides compulsory training on the identification of protected and endangered species to participating hunters. This last component should be taken seriously since a study by Hoyt (2004) in Liberia suggests that many people are unaware of which animals are protected and have only

limited understanding of the potential risk of animals to go extinct (locally or globally).

Regulating season, i.e. avoiding the sensitive periods such as the breeding time, can also reduce the pressure on wildlife populations. Moreover, sex-biased regulation, e.g. reducing a proportion of the males is less harmful to overall levels (Sutherland, 2000).

The approach of using hunting quotas can be problematic if hunting is carried out in a non-discriminatory manner i.e. using snares (Pailler, 2005). This will render hunting quotas ineffective e.g. a snare left to trap a duiker 'in season' could easily trap another species that is not 'in season', or even a protected species (Pailler, 2005). As part of the MCP trapping is limited around community farming areas. This simultaneously provides the trappers with bushmeat and protects the farm crops from small animals (Akumsi, 2003).

Many threats to local wildlife originate from illegal activities organized and financed from outsiders. These threats must be tackled through the support of national law enforcement agencies and not through the local community committees (Sutherland, 2000). However, local people can assist in the monitoring of illegal activities, drastically improving the efficiency of the typically underfunded and understaffed national wildlife agencies. The MCP has 'employed' local hunters to effect control the management area, by both reporting 'stranger hunters' within their territorial boundaries and by sanctioning infractions. The Mokoko system suggests that control of hunting must include destruction of traps beyond trapping limit, destruction of bush houses, frequent surprise controls of hunting zones, arrest of hunters operating with gun- or hunting permits or operating outside the hunting season and regionalizing control efforts (Olsen et al., 2001). For more information on anti-poaching measures see Appendix 2.

1.5 Discrepancy between the laws and the stark reality

Unrealistic legislation that is not in touch with the local realities and needs of people is difficult to generate high levels of local acceptance (Egbe, 2001). For instance, traditional hunting is legally defined as 'hunting using material made of plant origin, and can only be undertaken for subsistence consumption, never commercial transactions'. Yet, the use of locally made 'dane-guns' and steel wire cables in hunting is prohibited, although they are almost universally used. As part of

the MCP, all hunters were encouraged to register their guns with the authorities (Olsen et al., 2001; Egbe, 2001). However, in order to regulate hunting through issuing of hunting permits, these have to be affordable (Akumsi, 2003). The ultimate goal is to foster a responsible attitude towards wildlife amongst communities and thus to group permit holders into small self-governing associations, as suggested by the MCP (Olsen et al., 2001). Whilst the MCP models are based on local sustainability, they promote commercialisation of species and methods that are not valid with national law. The law needs to reflect local realities about which bushmeat products can legally be killed and sold within a sustainable yield regime (MCP Policy Brief, 2001).

The lessons learned from the MCP could in theory be applied to other forest areas that strive for a greater level of community involvement and improvement of livelihood and biodiversity conservation. However, even in an ideal situation where the law is appropriate, the quota system successfully implemented and rules and regulations enforced, the question still arises as to whether hunting quotas could ever be high enough to provide even a similarly high amount of protein and economic benefit to the people as they received with illegal hunting? Cash income derived from the sale of bushmeat in comparison to other economical activities, is of great value to rural people (see Table 3 p. 18 in Hakimzumwami, 2000; Asibey & Child, 2002). A study by Holmern et al (2002) in Tanzania showed that the quota for villages was too small, especially for the poorer households, and illegal hunting generated an economic value 45x greater than that derived from the cropping operation!

“In Conkouati, Congo and Dja (Lomié), Cameroon, hunters confirm that despite difficulties they experience during hunting, there is no other activity which can generate as high an income as hunting does. Hunting can continuously generate money for their survival” (Ngoma, pers. comm. 1997 in Hakimzumwami, 2000). In particular the low entry cost (minimal equipment requirements and no permit fees) make the bushmeat trade a feasible option for anyone (low risk enterprise) (Cowlshaw et al., 2004; Pailler, 2005). Thus ‘legal’ cropping operations may not necessarily put an end to illegal hunting.

1.6 Community Hunting Zones

Van der Wal & Djoh (2001) highlight the difficulty in achieving community management when coping with an inappropriate legal framework. The 1994

Cameroon Forestry Law and its 1995 Decree of Application on wildlife recognize the rights of communities to participate in forest management through provision of community forests and hunting zones (Olsen et al., 2001, Egbe, 2001). Community hunting zones give the community rights to a defined hunting territory, through a management contract between a community and the wildlife service (Van der Wal & Djoh, 2001). This hunting zone is to be used for '*the sustainable use of its wildlife in the interest of that community*' (Egbe, 2001; Tchigio, 2007). Community Forests and Community Hunting Zones are based on the same legislation. Both have a maximum size of 5000 ha and can only be attained in the agroforestry zone (part of the non-permanent forest estate, described as a mixed landscape of agriculture and forestry) (Van der Wal & Djoh, 2001; Egbe, 2001). Moreover, the area designated must be free of any other title (e.g. timber and farming). These criteria effectively exclude almost all available areas (Egbe, 2000 in Brown, 2003, ODI, Box 2).

In the Yokadouma and Lomié (Djaposten) areas in the East of Cameroon and the Poli Subdivision in the North, projects are assisting communities to establish hunting zones (Egbe, 2001). Reality shows that the actual hunting territory of Djaposten covers almost 52,000 ha, compared with the 5000 ha allowed for under the Community Hunting Zone legislation. Although forbidden by law, 83% of game is harvested from within the reserve (Van der Wal & Djoh, 2001). This level is, as in many other tropical forests, unsustainable. But with the problem of increasing populations and need for income (72% of total harvest is sold outside the village) new answers need to be found.

In theory, a community-based hunting zone should at least allow for the meat to be sold and therefore for income to be generated from this natural resource. This additional income is important for the improvement of people's livelihood, which is one of the twin goals of community-based wildlife management. In reality, however, hunting for commercial purposes is generally considered illegal (Roe & Jack, 2001). This statutory ban on the commercial sale of bushmeat by communities exercising traditional hunting rights is clearly unrealistic (Egbe, 2001). Furthermore, Brown (2003) points out that for families living in extreme poverty market sales of bushmeat are far more important than subsistence use. Therefore, putting a ban on market sales and stigmatising it as illegal but allowing subsistence use will not result in improved livelihoods (Brown 2003, ODI). The way forward is to recognize that local wildlife consumption and trade is something to be managed, not devalued and criminalized

(Brown, 1999). The bushmeat trade has to be brought into the open and possibilities for legal and legitimate trade must be identified (Brown, 2003). Only this will ensure sustainable livelihood benefits in the long-term. Furthermore, legalized hunting would be able to promote sustainable use of wildlife, only when the benefits of 'legal meat' surpass the value of 'illegally acquired meat' (see Egbe, 2001 for further discussion).

Van der Wal & Djoh (2001) also report on the protected area of Lac Lobéké in South-East Cameroon. Here the MINEF and several NGOs have also been trying to establish Community Hunting Zones. They have developed a concept of 'Zone d'Intérêt Cynégétique à Gestion Communautaire' (ZICGC), i.e. 'community-managed hunting concession'. These can be much larger than 5000 ha and are situated in the zone classified as 'permanent forest estate' (i.e. production forest) (Van der Wal & Djoh, 2001). Although the ZICGC seems appears to be a considerably more realistic approach, the actual management of the game species must still be resolved.

If local communities do not 'own' their surrounding environment, they will fear that any investment (or lost opportunity) on their side could possibly be capitalized by third parties (outsiders), and would therefore be risky. As a result locals will not have an incentive to invest in the long-term sustainable use of resources (Pailler, 2005). This recognition in itself makes community hunting zones an important contribution to wildlife conservation. In order to make the management of Community Hunting Zones a feasible part of wildlife management, communities have to be involved from the outset. An important aspect of this is 'participatory rural appraisal' whereby communities describe their social and economic practices, identify problems and constraints and formulate for themselves conservation and development opportunities that they may gain through community hunting zones. With this information pilot community hunting zones have to be developed and managed. Only in the field will we be able to test the feasibility of the concept (Van der Wal & Djoh, 2001).

1.7 Protected areas and the importance of source - sink dynamics

Many conservationists view protected areas as the last safe havens for large tracts of tropical ecosystems and advocate strict protection through authoritarian enforcement practices (see Wilshusen et al., 2002 for protectionist arguments). They

feel that integrated conservation and development projects have not effectively safeguarded protected area core zones and that sustainable use depletes biodiversity (Wilshusen et al., 2002). But should all protected areas be closed to use?

Local communities that rely on hunting bushmeat view protected areas as an infringement on their liberties and as a major opportunity loss for their economic development and life aspirations, as they are restricted in their use of traditional natural resources (Owono, 2001). As a result, compliance with and enforcement of any land use restrictions may be problematic (Fimbel et al., 2000; Novaro et al., 2000). The potential benefits of lands enclosed in protected areas for the local communities need to be identified and quantified, since they may place a substantial section of available and valuable resources out of local, poor people's reach (Egbe, 2001).

'No-take' areas as a management tool?

Novaro et al. (2000) suggest that in the Neotropics protected areas are centres of reproduction and therefore act as potential sources for the sites depleted by hunting. Thus, the protection of large undisturbed areas could be vital to achieving sustainable hunting (Novaro et al., 2000; Fimbel et al., 2000). Fimbel et al. (2000) argue in favour of a spatial separation of take and no-take areas (adopted from fisheries, see Milner-Gulland et al., 2003, Box 4) to manage hunting in African forests. For management this means that first of all it needs to be established if adjacent unharvested populations exist and if 'spillovers' (dispersal) would be sufficient to restock hunted areas (Milner-Gulland et al., 2003). The role of dispersal may be reduced in some animals due to their size or behavioral constraints (Novaro, 2000). Sites where large un-hunted populations have been identified should be designated as no-take areas. Spatial harvest would imply that animals in "take" areas may be hunted to extirpation without limiting the population as a whole as long as animals in protected areas are unexploited (Fimbel et al., 2000). The protected area must be large enough to sustain viable populations of hunted species, especially where large and mobile animals are concerned (Sutherland, 2000; Novaro et al., 2000; Milner-Gulland et al., 2003) and must allow for continuous movement patterns according to the species needs within the protected zone.

A further question is what landscape configuration of no-take and hunted areas would work best? (Milner-Gulland et al., 2003). Fimbel et al. (2000) suggest that a reserve design that includes a single central core protected area surrounded by

multiple use buffer-zones that include hunting blocks is likely to provide the best solution in large areas such as the Lobéké forest (see Fimbel et al., 2000 for details).

Benefits to the community

Local people are more likely to support full protection of source areas if they perceive direct benefits from them (Milner-Gulland et al., 2003). The value of setting aside no-take areas as a source for wildlife populations needs to be recognized by local communities (Sutherland, 2000; Novaro et al. 2000). Fimbel et al. (2000) propose that exceptions of access to the protected area can be made during certain seasons, e.g. to collect other NTFPs, use rivers within the protected area for fishing or allow hunting of species with low dispersal rates. This approach is in the interest of gaining local support. A spatial harvest system can realize the participation of communities and the creation of community hunting zones.

Local people realize that outside commercial hunters often harvest wildlife at grossly unsustainable rates and that gaining control over a community hunting zone is important in order to restrict access to ‘outsiders’ (Fimbel et al., 2000; Hoyt, 2004). In the Gashaka Gumti National Park in Nigeria (640,248 ha) active community participation in the park design was encouraged (Wright, 2003) and the rights of local people were strengthened to become stewards of resources which they could manage and conserve for their own benefit (Dunn, 1995). Secure land tenure and the ability of local people to limit access by outsiders (anti-poaching controls) is considered to be an essential requirement for sustainable management in Gashaka Gumti National Park (Dunn, 1995).

Thus combining protected area management with CWM could mean that hunters are actively involved in monitoring and enforcing rules and regulations in no-take areas (Novaro et al., 2000). This not only makes them cheaper than entirely state run protected areas (Milner-Gulland et al., 2003) but is an incentive to compliance, i.e. guardianship of the protected zones.

Spatial harvest vs quota system

In spite of uncertainties of source-sink dynamics of hunted species in tropical forests, no-take areas are an attractive alternative to quota systems since these are dependant on sophisticated knowledge of the biology and harvest statistics of the species (Fimbel et al., 2000; Milner-Gulland & Akcakaya, 2001; Milner-Gulland et al., 2003). Moreover, Milner-Gulland et al (2003) argue that no-take areas are a promising way to achieve landscape-wide sustainable hunting since it can be enforced

more easily than can restrictions on off-take (Wilkie & Carpenter, 1999; Milner-Gulland et al., 2003).

It has to be weighed up carefully whether either or a combination of both strategies would make a harvest model more foolproof with regards to unintentional over-harvesting. This is important where protected areas may be too small to restock adjacent hunting zones (Wilkie & Carpenter, 1999). Here quotas may be more feasible.

An inversion of priorities?

Many conservationists regard a livelihood approach to bushmeat conservation as an inversion of priorities. Protected areas should continue to be essential elements of global biodiversity conservation (Wilshusen et al., 2002). The need for effective protected areas and effectively enforced bans on particularly vulnerable species is paramount if biodiversity is to be maintained in the face of unsustainable hunting (Millner-Gulland et al., 2003).

CWM must be seen as a complement to, but not a substitute for, protected area approaches to wildlife conservation (Roe, 2001). One thing is certain; the failure to adopt an integrated protected area policy involving communities and their socio-economic environment encourages neither sustainable use of wildlife nor local co-operation in protected area policing (Egbe, 2001). We must rethink traditional approaches to protected area management (Bowen-Jones et al., 2002). It is frivolous not to embrace this new notion that local communities can play a vital role in achieving joint conservation goals; and more importantly this compromised approach should also satisfy those that do not support community-based approaches.

2. Case studies

The following examples demonstrate that it is possible to combine benefits for the traditional resource users with conservation goals. Ways of reimbursing communities for opportunity-costs incurred by conservation initiatives include a) allowing limited access to local people for harvesting key natural resources b) integrating conservation and development approaches or c) buffer zone management (Abbot et al., 2000), or a combination of these.

2.1 Can socially exclusive protected area management be successful?

From 1999-2003, the Campo-Ma'an Biodiversity Conservation and Management Project was run by SNV, a Dutch development aid agency, and Tropenbos, a Dutch NGO. The aim was to safeguard biodiversity, promote sustainable forest management and to boost economic development of local communities (www.panda.org).

The park's management did not integrate or consult the indigenous people (Bagyeli Pygmies) in decision making processes and prohibited hunting within the park without further reasoning (Owono, 2001). This top-down approach failed, generating resentment and mistrust between local communities and the project managers (www.panda.org). Mbile et al. (2005) suggest that the management of Korup National Park (KNP) in Southwest Cameroon failed for the same reasons (undermining of indigenous knowledge and traditional institutions). For 17 years (1986-2003) the management of KNP contained excessive 'quasi-exclusive' elements (Mbile et al., 2005), which decoupled the interests of local communities from the protected areas. This contributed to the fact that hunting in the park remains high (KNP Management Plan, 2002).

WWF took over the Campo-Ma'an project in 2003 with the concrete goal to regain trust and confidence by closely involving all stakeholders (see *Appendix 3* for definition) and promoting active participation.

The success so far includes:

1) Anti-poaching activities:

- 4 functional checkpoints at strategic zones around the park
- 25 guards for the entire zone
- seizurement of illegally hunted bushmeat
- destruction of hunting camps & prosecution of poachers
- training of guards in data collection techniques and community management methods, including legal training

2) Community hunting grounds:

- can be created in logging concessions and community forests
- can be managed by the community according to agreements made by all stakeholders

- can be leased by the state to sports hunting companies, which would pay a fee to local communities, such as in WWF's Jengi project in south-eastern Cameroon (see reference: WWF's Jengi project).
- 3) A future, but as of yet largely undeveloped, objective is to develop ecotourism for the improvement of the local's livelihood.

2.2 Linking protected area management and CWM

A good example of a successful zoning system is the WWF Dzanga-Sangha project in the south-western Central African Republic. The Dzanga-Sangha Protected Area complex (Dzanga-Sangha Dense Forest special reserve & Dzanga-Ndoki National Park – 4,500 km²) serves as a model protected area in the participatory approach to the integration of conservation and development (wwf.panda.org). The protected area is divided into a rural development zone, a communal hunting zone, a safari hunting zone and a zone for forestry exploitation (IIED, 1994).

The Ba'Aka pygmies living in the area have a deep knowledge of the environment they live in and realize that current levels of hunting are unsustainable. Thus, they are in support of the establishment of a no-hunting zone. The Ba'Aka are employed as research assistants for ecological studies, as tourist guides or are part of the anti-poaching unit. The community receives 40% of all tourist revenue, while 50% more is used to pay the salaries of the people involved. Anti-poaching patrols in Dzanga-Sangha Dense Forest Special Reserve have led to the arrest and imprisonment of 20 poachers, and subsequently a noticeable decline in bushmeat availability at Bayanga market (Raffaele, 2005). In addition, discouraged poachers now work as guards, encouraged by the good, constant salary (Raffaele, 2005 in Redmond et al., 2006).

Further support by the WWF includes:

- literacy and numeric skills for adults
- pre-school programmes
- a 'barefoot doctor' health care programme: basic health care and health education is brought to remote Ba'Aka camps

2.3 Engaging the private sector – an approach to sustainable CWM

The infrastructure of many forestry companies is used for the commercial bushmeat trade (Elkan & Elkan, 2002). To address the problems with wildlife

management in the forest concession areas, the Wildlife Conservation Society (WCS) began collaborating with the logging industry (Congolese Industrielle des Bois (CIB)) and the government of the Republic of Congo in 1999 with the aim to preserve wildlife in four concessions within Nouabalé-Ndoki National Park (NNNP) (Redmond et al., 2006). Activities in these concession areas can also have an impact on adjacent Lac Lobéké National Park in Cameroon and Dzanga-Ndoki National Park in Central African Republic (CAR) (Elkan & Elkan, 2002).

Initial steps undertaken were:

- 1) modify company interior regulations regarding bushmeat to:
 - ban the use of snares
 - prohibit the exportation of bushmeat from the sites
 - extend protection to protected species throughout the concessions
 - provide protein to workers of the logging companies
- 2) awareness raising and engaging stakeholders in discussions to encourage participation
- 3) pilot studies for alternative protein sources

Moreover, land-use zoning, based on studies of traditional community zones and natural resource use, was carried out. No-hunting areas, community hunting zones and buffer zones around the park were adopted and established in the concessions. Wildlife protection measures involved the training of locals and ex-poachers as Ecoguards (Elkan & Elkan, 2002). Control posts at key trafficking points were put into place, and mobile patrols surveyed important sectors of the forest. Through the creation of exclusive community hunting zones communities have been given a sense of ownership over the resource and this lead to wildlife acquiring a real value (Elkan & Elkan, 2002). This has been the biggest achievement.

Project progress is monitored by:

- 1) socio-economic monitoring programme: market surveys, household surveys, hunting return rate monitoring, population census baselines, an alternative protein source component and education dissemination processes
- 2) ecological monitoring programme: ecological surveys, forest clearing monitoring, success of wildlife protection efforts

2.3 Cross-fertilization between disciplines: The way forward?

Those working to bring the ‘bushmeat hunting crisis’ under control could adopt some of the methods that have been developed in the fisheries sector (Milner-Gulland & Akcakaya, 2001). The methods currently used for assessing the sustainability of bushmeat hunting are not precautionary, and are prone to overestimating the sustainable level of off-take (Milner-Gulland & Akcakaya, 2001).

The bushmeat problem is complex, involves many species and many different biological and socio-economic factors, and is rife in areas where the biological systems affected are poorly known and understood (Milner-Gulland & Akcakaya, 2001). Wildlife is difficult to manage due to intrinsic wildlife characteristics, such as high mobility and large home ranges, make effective long-term monitoring difficult (Brown, 1999). This also pertains to commercial fish stocks (Milner-Gulland & Akcakaya, 2001). Hence, methods used in fisheries management that explicitly incorporate uncertainty, such as Bayesian Statistics, should be considered to tackle bushmeat overexploitation (see Milner-Gulland & Akcakaya, 2001).

The principle of “individual transferable quotas” (ITQs) has been employed to regulate industrial sea fisheries (see Arnason, 2002 for detailed information; Brown, 2003) and has led to some real improvements in their management, without need for perfect knowledge of the condition of the resource, i.e. uncertainty as to the level of the stock (Brown, 2003). This rights-based management model, as opposed to common property arrangements, may prove useful in enabling the poor to define their rights to wildlife resources in communal management regimes (Arnason, 2002; Brown, 2003). An ITQ entitles its holder to harvest a predetermined percentage of the total allowable catch, which is set annually on the basis of scientific advice. The quotas are allocated to individuals on the basis of catch history (no. of animals taken out of the environment). Their value increases over time and they can be freely traded (Brown, 1999). The secure income offered by ITQs can be used as a basis on which to raise capital and encourage investment in the sustainable future of wildlife off-take (development strategy) (Brown, 1999).

Since off-take is based on catch history, the yield can be adjusted in the line of productivity. This is important since fixed quotas can easily lead to overexploitation (Sutherland, 2000), especially if populations naturally fluctuate from year to year (Brown, 1999). Constant discussion with user groups and creation of a resource use

calendar is important. Moreover, monitoring of harvests can be simplified dramatically as ITQs create an incentive for owners to catch free riders operating in the market (de Alessi, 1998 in Brown, 1999; Brown, 2003).

Brown (2003) notes that ITQs have not yet been tested as a mechanism to regulate wildlife. Although it is unlikely that the fisheries rights-based management models can simply be transferred to the bushmeat trade, it can definitely gain from the experience of the fisheries sector.

2.4 A virtual world - a simulation modeling approach

Creating no-take areas is one approach to managing populations under uncertainty. Another approach is introduced by Milner-Gulland et al. (2001). They evaluate the performance of a range of management strategies (Table 2a) of a simulated saiga antelope (*Saiga tatarica*) population under realistic levels of uncertainty. The best performing strategy was to only harvest a small proportion of the population per year, and not as previously suggested all individuals above a certain threshold (Milner-Gulland et al. 2001). Milner-Gulland et al. (2001) conclude that the simulation model approach is a valuable tool for the assessment of the performance of different strategies under uncertainty.

2.5 The economic efficiency of CWM

The lack of benefits from wildlife management, and thus financial sustainability, has been a key issue in developing sustainable wildlife management systems. In most scenarios the cost of management far outweighs the financial benefits that arise from it (Akumsi, 2003).

The *potential economic viability* of CWM in high potential areas has been clearly proven, but concerns have been expressed about the *actual viability* of projects (Rozemeijer, 2003 in Centre for Applied Research, 2003). Especially at the outset of projects there is high uncertainty regarding revenue streams. This is exacerbated by the fact that revenue can be highly dependant on development variables, such as rights, capacity and governance (Balint, 2006). The picture is further clouded by government subsidies, donor grants and other support measures that CWM projects may not receive in future (Arntzen, 2003 in Centre for Applied Research, 2003).

For these reasons the actual economic viability of CWM models is hardly known. However, benefit-sharing systems can provide returns to the community as a

whole from wildlife management and some recommendations for financial sustainability of wildlife management are given by Olsen et al. (2001) (see Table 1).

Table 1: Adapted from Olsen et al., 2001. Costs and benefits from CWM.

BENEFIT	COST
1) Joint control efforts: trap destruction, bush house destruction, surprise controls, arrests → increase wildlife populations → increase hunting quota	1) Monitoring, Control, anti-poaching expenses
2) National and international community support funds from data exchange	2) Communication over large area
3) Marketing bush meat – income	3) Bushmeat offtake & trade by outsiders
4) Tourist revenue	4) Equipment
5) Financial sanction mechanism: community receives share of fines and sanctions (50% in MCP)	5) Annual hunting permits, hunting effort
6) Benefits: 70% from auctioning off illegally hunted bushmeat (incentive for locals to report illegal activity)	6) Neglected redistribution of promised benefits

Nonetheless, it can take more than a decade for a project to become self-sufficient. Financial sustainability will remain a major challenge, but is a vital component to the continued independent existence of CWM.

Emerton (1999) gives a full account of the financial and economic impact on the government and the communities respectively of a CWM approach in Lake Mburo National Park in Uganda. Furthermore, Emerton & Mfunda (1999) evaluate the necessary steps to make wildlife economically viable for communities living around the Western Serengeti in Tanzania. Also, see examples of benefits and costs associated with CWM in Roe et al. (2000), p. 50-67.

2.6 Participatory Monitoring and Capacity Building

Participatory Monitoring

Monitoring involves analyzing the current situation in order to improve the existing programme (Sutherland, 2000). Monitoring includes determining whether

the planned activities have taken place (e.g. hire local hunters) and have resulted in the expected outputs (patrolling of the reserve). Finally, monitoring examines whether the expected consequences have occurred (i.e. reduction of hunting of species) and the main goal is slowly being achieved (e.g. increase of key bushmeat species).

MWMA (MCP) has put a wildlife monitoring system in place, the *Cameroon Biomonitoring Network*, which aims to be financially, technically and socially sustainable (Olsen et al., 2001). This system combines control and monitoring activities. Hunting paths and line transects are walked monthly to monitor changes in distribution and density of wildlife populations over time. Upon analysis of the data new hunting quotas are allocated. At the same time, new paths are identified and illegal hunting activities detected (Akumsi, 2003). This system has shown to be very cost-effective and self-financing (Olsen & Yaron, 2000 in Olsen et al., 2001). In addition, bushmeat sales are recorded to measure the commitment of registered hunters. Pepper-soup sellers, to whom the hunters sell their meat, are involved and provide information on off-take levels of the species sold, on sex ratios, hunting methods used and sometimes the location of hunting activities (Olsen et al., 2001; Akumsi, 2003). This requires training for correct identification.

A further example of good community bio-monitoring programme is that of Sapo National Park, which has shown to be an effective tool for ecological assessment and for involving local residents in wildlife management (Waitkuwait, 2001; Suter, 2001). The project included hiring and training local hunters as data collectors, developing data collection protocols, establishing transects, selecting key zones and focusing on 70 forest animal species (see list in Waitkuwait, 2001) for assessment of their conservation status and habitat quality trends from their population dynamics and behaviour (Waitkuwait, 2001).

Capacity building

External support has to be such that communities can wean themselves from it. This is the aim of capacity building. Capacity building is 'the ability of individuals, organizations, institutions, and societies to perform functions effectively, solve problems, and set and achieve objectives in a sustainable manner' (UNDP in Taye, 2006). Capacity building should be applied at several levels, from the individual, over organizations and even to governments (Balint, 2006). Decentralization and interactive participation will only be effective when complemented by developing the

capacities of those who will take ownership of the local governing process (Taye, 2006). Without this, a continued and self-sustaining project is not likely to be achieved (Balint, 2006). For more information on the importance of capacity building in participatory conservation projects see Taye, 2006.

2.7 How do forest and savanna approaches to CWM compare?

Savanna CWM models

In the literature, a great deal of attention has been given to savanna community based wildlife management models. This is not surprising, considering some of these were already implemented 30 years ago.

Prior to the ‘Luangwa Integrated Resource Development Project’ (LIRDP) in Zambia, twenty years of poaching reduced the elephant population from approx. 100.000 to under 30.000 and brought the black rhino to the verge of extinction (IIED, 1994). A model was established in 1986 to integrate local communities in wildlife management. A local committee decided the allocation of hunting quotas and revenues from wildlife (hunting concession fees, licence and trophy fees, surcharge on tourist lodges) remained in the area. 40% of the revenue generated was used for community projects such as establishing a health clinic, construction of new roads and a maize milling and distribution facility, the establishment of a bus service and a safari company (IIED, 1994). This is a good example of how conservation principles can be applied to development with the result that through community co-operation elephant poaching in this project area was brought under control by 1991 (IIED, 1994).

Zimbabwe’s Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) is one of the best examples of community based wildlife management (CWM). The goal is to empower private and communal landowners to manage and monitor the exploitation of mainly large mammal species. The underlying principle is that *‘effective management of wildlife is best achieved by giving it clear value for those who live with it and that there must be a positive correlation between the quality of management and the magnitude of benefit’* (Sutherland, 2000).

This scheme allows local people to earn direct economic benefits from the presence of wildlife, by harvesting animals in accordance with advice provided by the governments department of National Park and Wildlife management. Funds are

generated from the concession leasing of hunting, safari and tourism, game viewing and photographic safaris, trophy and bed-night fees (Hasler, 1999 in Roe & Jack, 2001). This approach gives the local people a vested interest in ensuring the survival of wildlife on the land, yet allows culling where it is necessary.

Similar CWM projects implemented game guard schemes which are not only beneficial to wildlife retention but also to improve people's livelihoods. The 'Lupande Development Project' in Zambia and the 'Herero Community Game Guards' in Kaokoveld, Namibia have both succeeded in involving the community directly in the protection and management of wildlife and thereby increasing wildlife numbers in the areas and establishing a booming tourist industry (IIED, 1994).

What are the positive impacts that can be gained from CWM?

Metcalf (1993) and IIED (1994), Roe et al., 2000; Roe, 2001; Roe & Jack (2001); Balint & Mashinya (2006) describe the benefits communities have derived from CAMPFIRE:-

- Re-awakening appreciation of the value of wildlife in local people
- Cultural strengthening: reinforce feelings of cultural identity and self-confidence
- Social re-empowerment
- Minimized wildlife-human conflict due to improved acceptance of a certain degree of disturbance
- Eliminating or drastically reducing poaching
- Improving environmental conservation practices
- Using wildlife revenues for food security in times of drought
- Providing employment and entrepreneurial opportunities (indirect financial benefit)
- Increasing household revenues from tourism (direct financial benefits)
- Institutional development and strengthening: funding schools, clinics
- Providing grinding mills and other community infrastructure
- Livelihood diversification: risk spreading

CAMPFIRE is often portrayed as an example of success in raising the income levels of poor rural communities and simultaneously increasing wildlife populations (Getz et al., 1999). Nevertheless, a more recent report from Balint & Mashinya (2006) suggests that the success of CAMPFIRE is declining. Communities no longer

receive the flow of significant social and economic benefits. Following the withdrawal of NGOs and government agencies responsible for oversight and capacity building, the traditional community leaders usurped power from the elected CAMPFIRE committee and co-opted the benefits. Thus, the main criticisms: that *'communities have still not received full authority for project management'*, must be viewed with caution. Full devolution of authority to communities without safeguards to maintain good governance and adequate capacity can lead to the deterioration of a projects success (Balint & Mashinya, 2006).

In the Western Serengeti, Tanzania, the prominence of the plains mammals is the key for tourism and provides almost US\$1.4 million per year to the Tanzanian government, which is generated through park entry fees, a percentage of bed-night fees, observer fees and handling charges. Some of the money contributes on the construction or maintenance of community infrastructure and enterprise support (Roe & Jack, 2001). Furthermore, the Serengeti Regional Conservation Strategy (SRCS) operates a community hunting scheme, where a quota of wildlife is assigned to each village. This is cropped by the Wildlife Department and the meat is sold to households at low prices. The money generated goes to a Village Natural Resource Fund (VNRF), which is managed and used by the Resource Council (Roe & Jack, 2001). However, it is estimated that 60% of households still regularly consume or sell bushmeat and that sales may be equivalent to 1/3 of the average farm income (Roe & Jack, 2001). As a consequence some innovative community-private sector partnerships have formed (examples of this: Maswa Game Reserve; Makao Open Area; Ngorongoro District), whereby private hunting companies directly compensate villages for use of their land for hunting. Further income is generated from a levy on tourist hunting (which can be used for anti-poaching expenses), culling licenses and a share of game meat from tourist hunting. Capacity building includes teaching local management trainees (Roe & Jack, 2001).

In theory, management systems in Tanzania call for promising results. However, the Wildlife Sector is suffering from sub-optimal management, with unsustainable growth, loss of revenues and lack of their distribution and limited participation of communities (Baldus et al., 2004). At the same time, the bushmeat trade in Tanzania has continued to thrive (Baldus, 2002)., the reasons being very similar to those in West and Central Africa (see Baldus, 2002). Since there is no effective monitoring of wildlife and a lack of an objective system for quota setting, it

is currently not known how sustainable hunting really is (Tanzania Development Partners Group, DGP).

A community-based natural resource management project in the arid Kunene Region of Namibia has successfully implemented a joint conservation programme with emphasis on local empowerment (Jones, 1999). This project grew out of the concern by conservationists and local leaders about a major decline in wildlife numbers due to heavy poaching and severe drought during the 1970s (Jones, 1999).

Benefits to the community are gained from tourist levy, safari companies and tourist lodges and employment of former poachers as game guards (Jones, 1999). As a result, the people's attitude towards wildlife improved. A new policy was implemented which proposed that if residents of communal areas formed a common property resource management institution called a 'conservancy' they would be granted 1) conditional ownership of certain species, 2) the right to use other species through a permit system and 3) the right to buy and sell game (Jones, 1999). A conservancy would need a defined boundary, a defined membership, a representative committee, and a legal constitution to be recognized by the government (MET, 1995 in Jones, 1999). In each conservancy, communities have the full control over the resources that the private sector (e.g. safari companies) wish to exploit (Jones, 1999). However, conservancies confer resource rights, but not land rights. This is potentially problematic, since conservancy land use regimes can be undermined by the influx from people and livestock from elsewhere (Jones, 1999).

The NGO, called Integrated Rural Development and Nature Conservation (IRDNC), has developed an approach which can be described as '*facilitation based on light touch adaptive management*' (Jones, 1999). Key principles were: a) to build on present conservation ethics of the communities, and thus to build a set of activities upon a problem which was defined by the local community, b) integrate local knowledge with 'modern' conservation experience c) facilitators should link communities with government agencies and developers d) NGOs and government play an advisory role to communities, ensuring that they have sufficient information and understanding of business practices and tourism requirements to negotiate with confidence (Jones, 1999).

Furthermore, a valuable lesson learned from the Kunene Region is that individuals and communities are not driven solely by financial profit, but also by the

prospect of livelihood diversification to minimise risks associated with an uncertain environment (Jones, 1999 in Roe & Jack, 2000, p.22). Non-financial benefits include: new adaptable institutions with a defined and committed membership; accountable leaders and a participatory decision-making process that includes women; new skills; integrated resource management systems; experience and confidence in dealing with outsiders; recognition from neighbours and outside authorities and increased pride through increased control over their own resources and livelihoods (Jones, 1999 in Roe & Jack, 2001). These non-financial benefits of living next to a conservation area were also stressed in the Western Serengeti (Tanzania) and included the availability of domestic energy, construction materials, grazing, foods and medicines in the wildlife habitats, and the illegal hunting opportunities (Roe & Jack, 2001).

2.8 What are the critical differences between savanna and forest approaches?

Forest mammals

One inherent difference between forests and savanna areas is the density of wildlife found. The combination of low biomass of mammalian herbivores in the forest, and the low rates of meat production of forest mammals, results in a low potential meat harvest in the forest zone as compared to savanna areas (Barnes, 2002). Thus, attempts to develop sustainable harvest models for forest regions may prove even more impossible, exacerbated by the fact that in the vicinity of forests the human population is growing rapidly from both reproduction and immigration. Barnes (2002) suggests that there is greater potential to manage wildlife for meat production in the forest/savanna ecotone or in the savannas in central and northern Cameroon, which are better suited ecologically for meat production (Barnes, 2002).

Tourism: the panacea for CWM in tropical forests?

The crux of the matter is that conservation initiatives must awaken an interest in communities to manage their wildlife sustainably and for this to happen generally profits (if monetary or otherwise) have to be sufficient (Van der Wal & Djoh, 2001). Experience from the Mount Cameroon project shows that involving hunters is difficult. They preferred to carry on illegally since individual benefits from uncontrolled hunting are higher than operating according to rules and regulations of the community wildlife management institution (Akumsi, 2003).

Tourism development is attractive as part of a conservation model because of the high revenues it can generate from the non-consumptive use of natural resources (Brown, 1998). Tourism based upon wildlife has become the leading foreign exchange earner in several countries (Reynolds & Braithwaite, 2001). Moreover, success stories of CWM have been much greater in areas with tourist potential than where the resource is primarily of interest for local consumption (Brown, 1999). In the savanna much of the economic benefits are derived from tourism and sport hunting. In tropical forest however, there has been little success in creating areas of high tourist potential (Brown, 1999) and it is here that wildlife management is still highly problematic, though here biodiversity concerns are often greatest.

Are these 'safari type models' (Brown, 1999) even a possible alternative in tropical forests? Van der Wal & Djoh (2001) question whether community hunting zones should be about bushmeat at all, or rather about trophy hunting for wealthy expatriates? So is there a chance for tourism in tropical forests?

According to Brown (1998) the potential for wildlife tourism in West and West-Central Africa is arguably low. He suggests that countries with poor tourist infrastructure and/or high political instability are unlikely to be able to generate sufficient revenues from tourism to justify the costs of protected area maintenance, let alone to develop national infrastructure to a point where tourism has the potential to support the national economy (Brown, 1998). Further limitations are outlined by Brown (1998) (see Box 2).

Although forest management models probably require fundamentally different strategies for wildlife management, one should not entirely exclude tourism from the range of options in an attempt to link conservation and development. Djoh & Van der Wahl (2001) report on the possibility of developing a 'community-based gorilla research and tourism site' in the Lomié region (villages of Koungoulou and Karagoua). Economically, this may be a very attractive additional source of income in regions where CWM is implemented already. In peaceful times, after tea and coffee, profits from gorilla tourism represented Rwanda's third largest source of foreign income. Djoh & Van der Wahl (2001) note that the habituation process of the gorillas will take a long time, due to previous hunting pressure on the species. Moreover, a further constraint is the efficiency of the tracking team – a must for tourism. An encouraging experience was to see that the villagers managed, without

assistance from MINEF, to completely free the gorilla forest zone from hunting (18 months) and already wildlife has increased (Djoh & Van der Wahl, 2001).

Some tradeoffs and compromises (often between the private sector and wildlife managers) have to be made when inviting tourism to an area. See a detailed discussion on the conflicts between the values of conservation, animal welfare, visitor satisfaction, and economic profitability in Reynolds & Braithwaite (2001).

Investment in development

A second theme that seems to stand out amongst the savanna CWM programmes is that a lot of effort is invested in development and especially improvement of infrastructure. Improving the infrastructure will invariably improve the living standards of any community, and should thus be one of the main development aids given by conservation initiatives. If communities *can* access other food, they *might*. In Korup National Park WWF initiated development projects i.e. improved cropping systems and livestock raising. This failed because the superior weight-to-value ratio of bushmeat over crops was not taken into account for communities who have to walk, sometimes for days, to the nearest road (IIED, 1994, p. 25, box.6). A note of caution: new roads also mean increased access to the forest and often lead to an increase of hunting pressure on wildlife (Wilkie & Carpenter, 1999; Barnes, 2002).

Furthermore, in forest regions there is certainly potential for other development opportunities, such as livelihood enhancement strategies (Brown, 1998) which improve people's quality of life. Balint (2006) reports on a community-based conservation project based near a protected area in El Salvador, where all households living in close vicinity of the protected area received solar panels and storage batteries. This project was a huge success since money previously spent on energy sources could be used for other purposes and hostility and resentment towards NGOs rapidly dissipated (Balint, 2006). This compensated them for agreeing to give up traditional access to resources in the newly protected area and accept land-use restrictions in the buffer zone (Balint, 2006).

Overall, there are no simple solutions to the bushmeat crisis, and what might be useful in Zimbabwe or Tanzania might not be applicable in West and Central Africa, where the situation is very different. Nevertheless, the conservancy land use regime introduced in the Kunene Region of Namibia does lean on the idea of

community hunting zones, and valuable ideas may be transferred. Currently, some forest CWM models are gradually evolving. As with savanna projects their implementation will be a voyage of discovery with many different but also similar challenges to face.

3. Conclusions

3.1 Where have CWM models gone wrong and what are the lessons learnt?

Most practitioners and researchers in Central Africa suggest that ‘modern’ legislation has to some extent resulted in a negative effect on communities, and consequently the sustainable use of wildlife resources (Hakimzumwami, 2000). Traditional authority towards the management of wildlife and community livelihood has deteriorated as a result. Consequently local communities no longer feel responsible for the conservation of wildlife or the wish to be involved in project activities (Hakimzumwami, 2000).

Recent Evidence suggests that the ways CWM models are applied and implemented are still flawed (IIED, 1994; Brown, 1999; Hakimzumwami, 2000; Roe & Jack, 2001). This complicates dialogue, participation and implementation and ultimately leads to the demise of CWM:

Community level:

- local knowledge is often imperfect, because of people’s historical alienation from nature
- a sense of custodianship is in many instances absent amongst local communities
- communities are complex and change constantly but project cycles do not take this into account
- reluctance of locals to admit to involvement in illegal practices

External actors:

- Insufficient socio-economic information: well-meaning preservationists create problems by limiting local people’s ability to market certain resources
- Failure to integrate conservation & development: many innovative alternatives in reality do not match with local conditions and were often introduced without knowledge whether they have tangible economic, environmental, social and cultural benefits

- CWM initiatives that have excluded traditional administrations (authorities) have had limited success (see Okapi Wildlife Reserve and Garamba NP in the Democratic Republic of Congo; Evaluating Eden Series No. 9)
- No real devolution of responsibility: Government and donor-supported CWM strategies have rarely proven willing to relinquish control over wildlife to rural dwellers (see CAMPFIRE).
- Compensatory measures: there are few agencies willing to compensate people for illegal practice foregone, and attempts to provide alternative income sources have not proven very effective.
- Lack of respect of local communities customary rights towards the use of wildlife
- Insufficient understanding of animal population dynamics and thus sustainable off-take levels
- Failure of equitable distribution of benefits: see ADMADE programme in Zambia and the WINDFALL project in Zimbabwe, even CAMPFIRE (government makes profit).
- The financial benefits of CWM are over-estimated and consequently over-sold to communities and donors
- Unrealistic promises about what a protected area can deliver and no mention of the time lag until profits become visible
- Non-financial benefits are underestimated but may eventually become the main impetus for CWM in many instances (Jones, 1999)
- Weak local governance: understaffed, insufficient means of transport to reach villages, low motivation etc.
- Failure to develop sufficient training programmes (capacity building)
- Inadequate legislation: social and cultural values of wildlife to communities are overlooked and the reality of bushmeat hunting is not reflected in the law
- Lack of support to local organisation initiatives: Wildlife legislation in Central Africa do not formally recognize local community initiatives aimed to control access to wildlife (MCP).
- Insufficient information exchange between stakeholders and clash of interests between stakeholders
- Insufficient dissemination of texts related to the conservation of wildlife

- Low levels of transparency for local communities and insufficient sensitisation of communities towards the new concept of wildlife management
- Characteristics of donors: complex bureaucracy adopted by funding agencies; donors insist on investing in new institutions, which invariably become centres of conflict in communities
- Insufficient and un-continued funding
- Insufficient scientific expertise in CWM: there is no efficient development approach and mechanisms for Environmental Impact Assessment (EIA), and Cost-Benefit Analysis (CBA), which might help to define the potential impacts of innovation before or after introduction; insufficient experienced personal.

For guidance on what makes CWM work also in the long run see Roe et al., 2000 (p. 91- 112).

3.2 Have CBM projects worked? What are the criteria for success?

Many studies recognize the fact that CWM is the 'right' approach, but this often seems to be more of a notion than a decision based on evaluation of successful projects. We realize the need to distance ourselves from top-down approaches and to integrate conservation with development. However, there is very little empirical evidence that initiatives have actually succeeded in achieving their goals, even successful initiatives such as CAMPFIRE are still dealing with criticism. Many forest CWM projects are relatively recent and experiences are limited. Therefore, it is often premature to conclude whether their practices are sustainable or not.

We need reliable indicators to measure the progress and success of a CWM initiative. But what is success and what criteria should success be judged on? There are no strict criteria for success, however the Centre for Applied Research (2003) suggests ways to review the progress made by Community Based Natural Resource Management (CBNRM) in Botswana. It is stated that CBNRM has no secure future without economic efficiency, equity and environmental sustainability:

- 1) without economic efficiency, the CBNRM project would remain dependant on external support
- 2) without equity, community conflicts are likely to interfere with the performance of the projects and

- 3) without environmental sustainability the resource base for CBNRM projects will vanish (Centre for Applied Research, 2003).

Thus, success should best be measured on all three levels, social, economic and environment (wildlife) and could include questions such as: Has the abundance of wildlife increased (in a particular area over a certain time frame) as a result of a CWM initiative and thus has the off-take model worked? Or, have household economics improved (per capita income, per capita calorie intake; benefit-distribution)? Are wildlife managers benefiting financially? On a scale of community participation how much power over wildlife management has been delegated to local communities? To what extent has capacity development been promoted, and can all these changes and achievements be attributed to the CWM initiative? CWM will always have ups and downs, “cycles of achievement and underachievement”. Thus, measures of success should be a continuous process, rather than a single snapshot in time (Roe et al., 2000).

For comprehensive checklists on socio-economic and environmental questions that reflect project success see *Appendix 4a* and *4b*, respectively (taken from Centre for Applied Research, 2003).

Each CWM model would have to establish its own criteria to assess whether the project has been successful. However, even with a relatively well-established programme, such as CAMPFIRE it is difficult to ascertain whether the ecological goals have been achieved. The problem stems from inconsistent methods of data collection (Hasler, 1999 in Roe & Jack, 2001). But as Carpaneto & Fusari (2000) state, quantitative data on subsistence hunting are essential to develop and assess whether exploitation of wildlife is sustainable. The same is true for measures on livelihood improvement and development.

3.3 Research needed to develop and improve CWM models

A useful and full guide for socio-economic, ecological and political research needs with identified constraints is given by Bowen-Jones et al. (2002). Also see Milner-Gulland et al. (2003) Box 5. Some of the most important questions include:-

- 1) How and under what conditions, can community management contribute towards a more sustainable bushmeat trade?

- a. What evidence exists- or what data should be collected- to determine whether increased local ownership will result in more sustainable management of wildlife?
 - b. What are the key social, economic and biological data needed to set up and monitor a community-based bushmeat management situation and how can this be collected in a cost-effective way?
 - c. What legislative models are appropriate for the management of community-based hunting, and how can these be adapted to the realities of commercial as well as subsistence hunting?
- 2) Is a traditional protected area (PA) approach a complete or partial solution to protecting vulnerable wildlife populations affected by the bushmeat trade?
 - a. Is the establishment and community management of community hunting reserves around well-designed core areas feasible?
 - b. Do current protected areas lend themselves to being converted into areas with more holistic management objectives?
- 3) Can the 'by-catch' problem be reduced or eliminated through the instigation of different management regimes for different species, and if so how? (see Bowen-Jones et al., 2002 for related specific questions)
- 4) Can wildlife populations be monitored for purposes of control and management of the bushmeat trade, and if so, can indicator species or surrogates be used to determine whether the wider bushmeat trade is sustainable or not? (see Bowen-Jones et al., 2002 for related specific questions)

3.4 Final thoughts

The bushmeat trade is deeply embedded in the general economy, widely distributed geographically, mainly in areas with few legal controls (Millner-Gulland, 2002; Cowlshaw et al., 2004). It is the toughest challenge yet for human centred conservation.

Development and conservation have to go hand in hand. But is development and poverty alleviation really always part of the deal? An important cause of poverty is the *'lack of participation and failure to draw the poor into the design of development programs'* (World Bank Statement). However, does this mean that successful community participation will automatically lead to improved livelihoods?

Past experiences have shown that this is not always the case. Similarly, if community income and living standards improve, this does not automatically result in a reduced pressure on wildlife, especially if illegal activities remain more profitable. Hunting will continue as long as 'real' complementary or alternative sources of income are unavailable.

Nevertheless, given the actual and potential conflicts between biodiversity and the imperatives of socio-economic development in Africa, major priority must be given to livelihood concerns (Brown, 2003), thereby incorporating socio-economic dimensions into protected area and wildlife conservation (Cowling & Wilhelm-Rechmann, 2007; Inogwabini, 2007; Githuru, 2007). Promising developments such as the Mount Cameroon Project have been at the forefront of creating such a joint livelihood and biodiversity strategy (Brown, 1998).

It has increasingly been recognized that sustainable management is about political negotiations between stakeholders rather than one stakeholder taking control, whether it is the community or the state. Thus perhaps 'collaborative' rather than 'community-based' wildlife management better describes the current state of play (Hakimzumwami, 2000; Roe et al., 2000)

Much of the literature and the lack of information on forest CWM models call for further study. The field of forest CWM is still in its infancy. Experience with, and the success of, community involvement have been far greater in savanna regions. Some valuable lessons can be learned from these savanna approaches, but caution must be exercised when transferring these models to forest regions. Because of differences in socio-economic and ecological variation and tourist potential, no one management model can be a recipe for all areas. New models have to be constructed to appropriately suit each individual context.

Developed countries can afford to worry about environmental problems and thus try to impose their environmental ideals on developing countries. We accuse developing countries of exploiting their resources selfishly. But, people should not feel that they have to apologize for trying to make a living by using wildlife. Rather, a balanced compromise must be found. Although people are the cause of conservation problems, they have to be seen as part of the solution (Knight et al., 2005), since in the end the gradual extinction of bushmeat species will also mean an end to a significant food and income source for rural Africans (Wilkie & Carpenter, 1999; Fa et al., 2002; Pailler, 2005). Communities have to realize that unless future

management is carried out sustainably (protecting areas, limiting use of bushmeat), the ‘so valued’ protein and income source will disappear eventually (Hakimzumwami, 2000).

From past experience it is clear that progress will be at a snails pace. However, the alternative to making changes and learning from past mistakes would be to allow continued unrestricted access until key bushmeat species are eliminated from an area. This scenario is hardly desirable. Thus, whatever we do, we should not give way to the ‘doomsday view’, but must stay optimistic. Doing something is always better than doing nothing.

A call for Optimism

With the escalating rates of bushmeat exploitation, an exponential growth of the human population and the slow process of achieving change, conservationists and managers typically become increasingly jaded and pessimistic. However, instead we should adopt a positive outlook in our work and give reason for hope (Beever, 1999).

Starting from a situation in which the human dimensions of conservation were hardly recognized at all, expectations were suddenly raised to unrealistic levels, and the social development component was now expected to compensate for all the former failings (Brown, 1998). This meant that many CWM projects were condemned as a failure before they had a chance to succeed (Roe, 2001). We have to be more patient and move away from idealism towards robust and refined models which can be used as conservation and development tools (Roe, 2001).

In this task optimism is crucial. We must foster optimism, not least because our success in alleviating the pressure on wildlife and increasing people’s livelihoods will very much depend upon how we, as conservationists or managers, are perceived by decision-makers, donors and the public at large (Beever, 1999). An overly sceptical and pessimistic perspective may result in missed opportunities to create revolutionary ideas, develop new, hopeful methods, or formulate new important questions (Beever, 1999). This call for optimism should by no means imply that we should abandon realism and critical evaluation (Beever, 1999). It is important that conservation failures and setbacks do not give way to pessimism, but instead should stir us into action all the more.

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Appendix 1



Adapted from Cowlshaw et al. (2004). The Takoradi bushmeat commodity chain. The width of the arrows is proportional to the weight (kg) of bushmeat traded between the actors.

Appendix 2

A combination of the following measures can be used too discourage poaching (Sutherland, 2000):-

- Encouraging the government or authorities to strengthen the law or increase the consequences of it being broken.
- Increasing public awareness of the conservation problems to make the market unacceptable
- Encouraging the government or authorities to strengthen or enforce existing laws on buying or selling products of illegal persecution
- Identify the weakest point where action is most effective.
- Running education programmes to explain the law if there is a lack of knowledge as to what is illegal.
- Increasing public awareness to make persecution unacceptable
- Creating and marketing alternatives
- One key way to success is to use psychological operations i.e. make the operation or anti-poaching organization seem large, powerful and effective, so that it seemed that the risk of being caught has increased dramatically.
- During patrols people have to be told about the role of the 'anti-poaching squad' and ask people to provide information about poachers and traders.
- This will create a network of information. And one can use press coverage (depends) on any success.
- Use and pay informants; provide a reward system for individuals who provide information or take action in uncovering illegal activities
- Increase the efficiency of prosecution e.g. work with and educate the police.
- Have some system that will allow fast action when poaching has occurred. And effective communication between team members.

Appendix 3

Identifying stakeholders - Who to collaborate with?

Identifying and encouraging political negotiations between stakeholders is one of the first steps in building a sustainable management model (Roe, 2001). These have to be incorporated from the beginning of the planning process (Muruthi, 2006). Stakeholders are the groups or individuals involved, especially the ones who hold influence and who's lives may be affected by the conservation or development (Sutherland, 2000).

Sutherland (2000) identifies three main groups:-

- *Primary stakeholders*: intended beneficiaries of the project
- *Secondary stakeholders*: involved in working for the project, including suppliers or users of products but not the intended beneficiaries.
- *External stakeholders*: those interested in the outcome but not directly involved (government departments).

These groups include (adapted from IIED, 1994):-

- Local resource users: farmers, hunters etc.
- Non-governmental conservation groups
- Non-governmental development groups
- Commercial/industrial business people (forestry, fishery, bushmeat harvesting)
- Relevant government agencies, especially forestry, wildlife, game etc.
- Private landowners
- Conservation and science researchers
- Donors
- Local institutions

Appendix 4 a

Key questions	Sub-questions
1. Who are the stakeholders in the project?	What are the main groups involved? What are their overall strategies and interests and what is their role in CBNRM (internal and external stakeholder)? What is their dependency on CBNRM? Which groups have common interests (e.g. direct participants and facilitators)? Which groups have conflicting interests (e.g. direct participants and facilitators)?
2. Is the project economically viable?	What is the economic potential? What have been the economic results in the past, and what has been the trend?
3. What is the financial impact of the project on local communities and households?	What has been the financial impact on the community? What has been the financial impact on households? Are the financial benefits increasing or decreasing?
4. What are the livelihood impacts of the project on communities and local households?	What are the LLH strategies, security and levels? What are the positive and negative LLH impacts? Are the benefits increasing or decreasing? What are the impacts on livelihood security and resilience? How are positive and negative impacts distributed within the community? Is compensation provided for negative impacts? What was the livelihood situation before the project? Answers at community and household level.
5. What is the impact on non-participating local residents?	What are the positive and negative impacts on non-participants?
6. What are the impacts of the project on commercial companies/ Joint venture partners?	Why did CBO link up with JVP (question for CBO only)? What are the financial benefits and costs for the JVP? What are the other benefits and costs for the JVP? Are the benefits increasing or decreasing?
7. What is the impact of the joint venture partner on the project?	Which contributions does the JVP make? Which long-term investments has the JVP made in the CHA? Are the contributions increasing or decreasing in time? Does the community have the capacity to negotiate with the JVP and monitor its activities? How has tendering assisted communities in their dealings with JVP? Are there better selection and allocation methods?
8. What is the impact of support organisations such as government, NGOs and donors on the project?	What has been the contribution of the supporting organisation to CBNRM? What has been the impact of this contribution on the project implementation and impacts on local communities and people?
	How has tendering assisted communities? What are the alternatives? How do external stakeholders benefit or lose from the project (benefit distribution among internal and external stakeholders)?
9. What is the overall development impact?	Does the project contribute to income generation, employment creation, economic growth and diversification, poverty reduction, food security and livelihood security? Are revenues used to mitigate adverse drought impacts? Does the project contribute to the development of tourism industry? Does the project contribute to foreign exchange generation? Does the project lead to conservation and increases in national assets?
10. What is the likely contribution of the project to resource conservation?	Have popular attitudes towards natural resources become more positive? Which resources are influenced by the project? How are the off-take levels determined? Who determines? How does the project contribute to their conservation (e.g. reduced poaching, sustainable harvesting methods, better local monitoring and management rules)? Has there been any restocking and replanting of veldproducts?
11. Which 'shocks' have influenced the project's results?	Which natural shocks have influenced the project's results positively? Which natural shocks have influenced the project's results negatively? Which 'man-made' shocks have adversely affected the project's results? Which 'man-made' shocks have positively influenced the project's results? Also indicate the impacts of the shocks.
12. Which trends in the 'context of CBNRM' have influenced the implementation and results?	List trends with positive impact on CBNRM: List trends with negative impact on CBNRM
13. Which alternatives exist for CBNRM to raise rural livelihoods and to protect natural resources?	Which alternatives for resource conservation? Which alternative livelihood sources?
14. Future, lessons and improvements	What do you expect the LLH situation to be 5 years from now, and what role do you expect CBNRM to play? How could the project be improved/ made viable (economically, socially and environmentally)? How can the contribution of the project to rural LH be increased? How can the project contribute more to natural resource conservation? How can external organisation improve their support for direct stakeholders? How can the contribution of JVP to community development and LH be improved? How can the community improve the project? What alternatives exist for the CBNRM project?

Checklist for socio-economic impact assessment. The check lists can be used for literature reviews, interviews and case studies (Adapted from Centre for Applied Research, 2003).

Appendix 4 b

Key questions for the environmental review are:

- What was the resource base prior to CBNRM?
- What is the regeneration/ carrying capacity of the resources?
- What have been the permitted and actual harvests? How have the permitted levels been determined and by who?
- Which resource management system, including resource monitoring, has been put in place and how effective is it?
- What has been the impact of CBNRM on natural resources (e.g. resource amount, illegal off-take, restocking/ planting)?
- Which other environmental impacts result from CBNRM projects?

Adapted from Centre for Applied Research (2003)