

# The Role of Alternative Livelihoods in Achieving a People-Centered Approach to Conservation : Lesson Learned from the CARPE Program

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## 1. Introduction

### 1.1 Overview

The U.S. Agency for International Development's Central African Regional Program for the Environment (USAID/CARPE) has adopted a "people-centered approach" to conservation. This approach recognizes that, given the widespread and acute poverty prevalent in the Congo Basin, conservation efforts will only be successful in the long term if local populations find viable alternatives to current natural resource use patterns that degrade the environment. This approach therefore necessitates a balance between conservation via the exclusion of individuals from protected areas of high biodiversity, and conservation via the promotion of alternative livelihoods that allows individuals to use natural resources in a more sustainable manner (USAID/CARPE,

2006).

In the CARPE people-centred approach to conservation, helping people is not considered an ancillary social objective inserted into the conservation programme, but rather an a priori condition needed to achieve the programme's conservation objectives. Put another way, the promotion of alternative livelihoods for communities is a necessary means to a conservation end. For CARPE, with its mandated strategic objectives of biodiversity protection and reducing deforestation (USAID/CARPE, 2008), the end has been clearly established as biodiversity conservation. While CARPE's help to communities in the form of support to alternative livelihoods provides a positive outcome in human terms, the reason that CARPE as a conservation programme supports these activities is that without them the conservation objectives will not be achieved.

The overall purpose of this article is to explore

the relationship between livelihoods and conservation in order to explain in a detailed and rigorous manner why CARPE supports alternative livelihoods to achieve its conservation objectives. As a part of this analysis, this document reviews three CARPE lessons learned case studies of how CBFP<sup>1</sup> /CARPE landscapes have incorporated alternative livelihoods into their conservation programme.

## 1.2 Background

The USAID Central African Regional Program for the Environment (CARPE) is a regional initiative that began in 1995. The Strategic Objective of CARPE is to reduce the rate of forest degradation and loss of biodiversity through increased local, national and regional natural resource management capacity in nine central African countries<sup>2</sup>. During its first phase (1995–2002), CARPE’s purpose was to increase knowledge of Central African forests and biodiversity and build institutional and human resource capacity. Currently in its second phase (2003–2011), CARPE has three main goals<sup>3</sup>: i) the implementation of sustainable natural resources management practices; ii) the improvement of environmental governance in the region; and iii) the strengthening of natural resources monitoring capacity in Central Africa (USAID/CARPE, 2008).

The first goal, by far the largest component of the overall programme, corresponds to CARPE’s landscape programme. This component involves the implementation of field-based conservation activities including sustainable livelihoods in 12 different large-scale landscapes constituting in total nearly 80 million hectares spread across seven different countries. The programme classifies three types of “macro-zones” within the broader landscape: protected areas (PAs), CBNRM<sup>4</sup> zones (Community Forests) and ex-

tractive resource zones (principally logging concessions but including mining, oil extraction and agricultural plantations). A key component of the landscape programme involves land-use planning (LUP) and the development of management plans for macro-zones and the entire Landscape.

USAID/CARPE moved its management team from Washington DC to Kinshasa, the Democratic Republic of Congo (DRC), in 2003 in anticipation of the shift from Phase 1 to Phase 2. This move also corresponded with a major scaling up of field activities from a base<sup>5</sup> of US\$ 3 million/year in Phase 1 to a base of US\$ 15 million dollars/year in CARPE Phase 2 starting in fiscal year 2004. The second phase of CARPE is in fact divided into two phases, Phase 2A (2003–2006) and Phase 2B (2007–2011).

## 1.3 Formalizing a people-centred approach to conservation

Toward the end of Phase 2A, CARPE/USAID commissioned an external assessment of the expanded programme to evaluate the results achieved in Phase 2A and to make recommendations for Phase 2B (Weideman Consortium, 2006). Several of these recommendations are pertinent to the direction that CARPE/USAID has taken in terms of the livelihoods component of its conservation strategy.

First, the external assessment suggested that greater emphasis needed to be put on livelihoods activities in support of conservation objectives. In order to do so, the report gave three specific suggestions. First, it recommended that new partners should be brought into the landscapes that have competencies in rural development. Second, it noted that, among the three categories of CARPE “macro-zones”, a preponderance of fun-

<sup>1</sup> Congo Basin Forest Partnership, a multilateral initiative for conservation in Central Africa. CARPE is the U.S. Government’s principal contribution to the CBFP.

<sup>2</sup> The Central African Republic, Equatorial Guinea, Gabon, Republic of Congo, Burundi, Cameroon, Rwanda, Sao Tome & Principe, and the Democratic Republic of Congo.

<sup>3</sup> Known as “Intermediate Results” or “IRs” in the language of USAID.

<sup>4</sup> Community-Based Natural Resource Management.

<sup>5</sup> This does not include matching funds from other donors or complementary U.S. Government funding such as Economic Support Funds (ESF) from the State Department or the Great Ape Conservation Fund from the Fish and Wildlife Service.

ding was being spent by CARPE landscape partners on protected areas. In order to achieve the broader landscape objectives it would be necessary to “place growing attention on addressing threats and opportunities in forest concessions and with communities”. Forest concessions and community zones imply human multiple use of forest areas and are therefore closely linked to livelihoods issues. Finally, the report suggested establishing some minimal level of required funding for development activities with local communities to better integrate them into conservation objectives.

In response to the external assessment’s recommendations, the CARPE/USAID management team took the following measures as reflected by the terms of reference (TOR) for the Phase 2B RFA<sup>6</sup> funding proposals (USAID/CARPE, 2006). The new TOR required an explicit “Strategy Document” that outlined the steps necessary to elaborate a landscape-level management plan. A template was developed by the US Forest Service which describes in detail the required components of a strategy document. One key component involves the identification of macro-zones, including all three categories, within each landscape.

This planning requirement was an effort to move away from a PA focus to a landscape-level focus that included an emphasis on community areas and extractive zones as well as the environmental interrelationships that exist between all the macro-zones at a landscape level. To further reinforce this integrated landscape-level approach, the TOR required that at least 50 percent of budgetary resources be spent outside PAs.

Finally, the TOR mandated that the landscape lead conservation NGO’s<sup>7</sup> form consortia including “complementary organizations with the competencies necessary to carry out complex landscape planning and the execution of landscape plans”. In addition, a minimum skill set for the consortia was required to include competencies in PA management, biological and socio-

economic monitoring, livelihoods and economic development, participatory community development, natural resource governance, sustainable forest management and gender. By specifying these minimum competencies, the USAID/CARPE management team intended to further guide the potential recipients in their selection of consortia partners and the list clearly reflects an increased emphasis on the promotion of alternative livelihoods for local communities.

#### **1.4 Conservation vs. development: a false dichotomy**

Prior to Phase 2B, the language used to describe CARPE activities generally made a distinction between activities that promoted “conservation” and activities that promoted “development”. For example, even the 2006 external CARPE evaluation called for a “more precise approach to balancing conservation and development activities in the landscapes”. The report further suggested establishing a “development window” to search for development funding to complement conservation funding in the landscapes (Weideman, 2006). This use of language implies that development funding is by its nature distinct from conservation funding. Indeed, a frequent sentiment expressed by individuals working in conservation NGOs in the Congo Basin was that money spent on development activities within a conservation programme resulted in less funding being available for conservation activities.

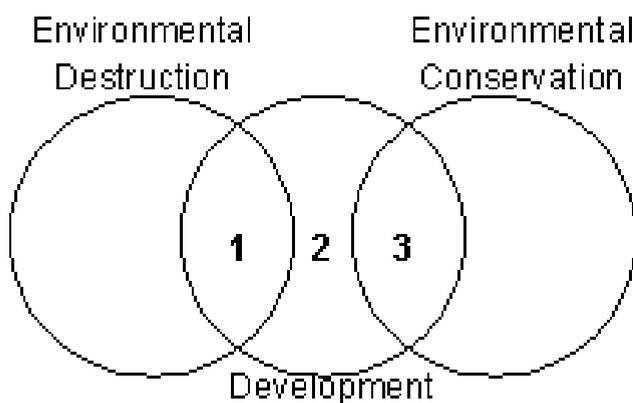
Clearly not all development activities promote conservation objectives. Clearing forest areas for large-scale ranching or building a factory that pollutes both the water and air may indeed provide employment, augment individual incomes and increase a country’s gross national product and therefore contribute to “development”, but are antithetical to conservation objectives. However, where unsustainable natural resource use by local communities exists, development activities in the form of sustainable alternative livelihoods can support conservation. For example, if a programme of small animal husbandry provides an

<sup>6</sup> “Request for Assistance” – a USAID mechanism for eliciting project funding proposals.

<sup>7</sup> World Wildlife Fund (WWF), Wildlife Conservation Society (WCS), Conservation International (CI) and African Wildlife Foundation (AWF).

economical source of protein and thereby reduces bushmeat hunting, does it make sense to classify this as a non-conservation “development activity”? Similarly, if permaculture<sup>8</sup> or wood lots reduce the felling of forests are they not part of a conservation strategy? The dichotomy between conservation and development appears at best inaccurate, at worst misleading.

Figure 1 indicates that certain development activities lead to environment destruction (area 1), others are environmentally neutral (area 2), and others support environmental conservation (area 3). The CARPE approach is to engage in an environmental threats-based analysis to identify those livelihood activities that are currently leading to environmental destruction (area 1) and seek to promote sustainable alternative livelihoods that contribute to conservation (area 3).



**Figure 1. Relationships between environment and development**

Perhaps an even more important question is whether conservation efforts can succeed without support for alternative livelihoods? Three of the principal causes of environmental degradation in the Congo Basin are bushmeat hunting, slash-and-burn agriculture and harvesting of fuel wood from natural forests (State of the Forest, 2006). All of these activities are characteristic of rural communities in the Congo Basin living in poverty.

For example, in the DRC, which contains over 50 percent of the basin’s forests, 59 percent of the population lives in extreme poverty subsisting on less than US\$ 1.25 a day<sup>9</sup> and 76 percent of the

population is undernourished (World Bank, 2007). The predominant livelihood activities of rural communities in the DRC likewise include slash-and-burn agriculture, hunting, fishing and gathering of forest products. Fuelwood/charcoal is the principal source of energy for cooking. These activities all involve extraction from the natural resource base and thus can contribute to environmental degradation. Further, with a demographic growth rate of 3.1 percent, the population of the DRC is expected to increase from 68 million in 2010 to 108 million in 2025, i.e., an increase of 40 million in only 15 years (United Nations, 2008).

If these livelihood activities are the principal causes of environmental degradation, can conservation objectives be achieved solely by restricting poor rural households’ access to these resources on which their very survival depends? Aside from the moral implications of depriving vulnerable populations of basic sustenance, consider for a moment the logistics. Given that there are millions of rural households in the Congo Basin living in remote and highly dispersed environmentally sensitive areas with little or no presence of the State, conservation strategies based uniquely on denying individuals access to these natural resources are simply not logistically feasible. In sum, given the extreme poverty, rapid population growth and the high dependence on natural resources for survival combined with the logistical difficulties and negative moral implications of denying poor people access to natural resources, a conservation strategy which does not promote sustainable alternative livelihoods will not achieve its environmental objectives.

### 1.5 A typology of livelihood-conservation linkages

This sub-section proposes a specific typology of how livelihood activities can contribute to conservation. This typology can help to analyze the type of linkage that exists between livelihoods and conservation as well as to better design livelihood activities to meet conservation objectives. Table 1 displays the four-category typology.

<sup>8</sup> Permanent agriculture as an alternative to shifting slash-and-burn agriculture.

<sup>9</sup> The Millennium Development Goals measure of extreme poverty.

**Table 1. A typology of livelihood-conservation linkages**

Threat-based	Interdependency
Quid pro quo agreements	Unlinked

The threat-based linkages have already been referred to in Section 1.4. As mentioned previously, hunting, slash-and-burn agriculture and fuelwood collection are three principal causes of environmental degradation in the Congo Basin. In the case of a threat-based linkage, a conservation organization identifies the particular threats in the area it is working and proposes livelihood alternatives that are direct alternatives to the identified threat. For example, in the case of hunting, a logical alternative is small animal husbandry such as chicken, goat and/or pig raising. For slash-and-burn agriculture, improved soil fertility management (e.g., leguminous fallows, chemical and/or organic fertilizer amendments, etc.) can allow longer use of a given parcel and decrease agricultural expansion into the forested areas. In addition, improved seed and other productivity-enhancing practices (including for aforementioned fertility practices) can allow farmers to produce more using less land and thereby reduce deforestation. Tree plantations are a further example of a threat-based livelihood alternative to the felling of trees for fuelwood in natural forest areas.

Interdependency linkages imply that a livelihood activity depends on the conservation of the natural environment. Perhaps the most famous example of these is the Brazilian rubber harvesters who extract rubber from natural forests in the Amazon and who have strongly resisted forest conversion to other uses, notably ranching. They have been strong advocates of forest conservation precisely because their livelihoods depend

upon it. In the Congo Basin, a few of the most common non-timber forest products (NTFPs) that depend on the conservation of the forest are forest honey<sup>10</sup>, medicinal plants and caterpillars<sup>11</sup>. If these and other forest-based products can be promoted through greater commercialization to markets which, in turn, increases local communities' incomes, then a constituency for forest protection can emerge.

Aside from NTFPs, ecotourism is another important example of how a livelihood activity depends on conservation of the natural environment. If the natural environment is destroyed, then tourists will no longer spend money to visit a site. The critical question here is whether or not local communities are receiving benefits from touristic activities. For example, is there revenue sharing of park entrance fees with local communities? Do the local communities own or work in businesses that provide goods and services to tourists (e.g., hotels, restaurants, artisanal products, cultural shows, etc.)? Are individuals from local communities employed in the park as rangers, guides and maintenance workers? If local communities are integrated into tourism activities such that the benefits of tourism outweigh the previous benefits received from extracting natural resources within the park<sup>12</sup>, then a local constituency for environmental conservation will emerge.

Interestingly, safari hunting is an activity that combines both forest-dependent products and tourism. Forest animals are indeed forest "products" that depend on conservation of the forest as a habitat needed for their survival. Safari hunting is a touristic activity that has the potential to generate significant revenues to local communities as typically safari hunters pay hefty fees to hunt. If local populations receive significant benefits from safari tourism, then they will have a direct stake in fighting illegal hunting. If there are no longer game animals to hunt, then the safari hunting and its accompanying revenues to communities will

<sup>10</sup> In some cases, forest dwellers traditionally referred to as pygmies fell trees in order to harvest honey for subsistence consumption which would not be sustainable in a commercial context.

<sup>11</sup> Caterpillars are consumed as an important source of protein in the Congo Basin.

<sup>12</sup> In fact, certain extractive activities within a park are not unsustainable or environmentally destructive. Subsistence fishing, the collection of "dead" firewood, the gathering of traditional fruits, nuts and medicinal plants all may be compatible with ecotourism activities and, if so, should be encouraged as they lower the opportunity cost to local communities of establishing a protected area.

cease.

The third type of livelihood-conservation linkage is through *quid pro quo* agreements. A *quid pro quo* agreement means that one party agrees to do something in return for the agreement of another party to do something else. In this case, a conservation project agrees to fund a livelihood activity in return for a local community agreeing to restrict their use of certain natural resources such as hunting and farming in a protected area. For this category, the livelihood activity may not be directly linked to an environmental threat or interdependency.

A conservation project, for example, may agree to build wells for clean drinking water or install electrification to run small-scale mills to transform grains and cassava into flour, neither of which typically have a direct link to conservation. In some cases, the agreed-upon support to a local community may not be a direct livelihood activity that provides current household sustenance needs, but rather an activity that indirectly supports livelihoods such as provision of schools and medical facilities. A payment for environmental service (PES) is generally another example of this type of agreement as one party (e.g., a buyer of a carbon credit) agrees to pay another party (e.g., a local community) if they agree to provide an environmental service (e.g., the protection of a forest).

The critical issue for a *quid pro quo* agreement is that it should be formally recognized by both parties so each clearly understands and accepts their rights and obligations. Given the emphasis put on land-use planning in the CARPE programme, a logical place to formalize these types of agreements is in the context of a management plan. These plans establish restrictions concerning natural resource use but they also generally have a section on support to communities in the form of development activities.

The final category of livelihood-conservation relationships is where there are no linkages. Support to agriculture, for example, that doesn't improve soil fertility or isn't linked to production in

already cleared areas may result in increased clearing of forests for cropping. In the case of community health projects, there is no *a priori* reason to believe that healthier individuals won't hunt more animals and fell more trees if there are no formal linkages between support for health projects and environmental conservation.

## 2. A review of the livelihood-conservation case studies

### 2.1 Introduction

The CARPE lessons learned initiative included three case studies of the integration of livelihoods into conservation programmes. The three case studies are based in the Salonga-Lukenie-Sankuru Landscape, the Maringa-Lopori-Wamba Landscape and the Maiko Tayna Kahuzi-Biega Landscape. This section reviews these case studies using the typology presented above and synthesizes the lessons learned as identified by the authors.

### 2.2 The Salonga-Lukenie-Sankuru Landscape case study

WWF, the leader for this Landscape (abbreviated as the Salonga Landscape), included PACT<sup>13</sup> as part of its consortium for CARPE Phase 2B. PACT is an NGO with competencies in community development and has taken on the bulk of alternative livelihoods activities in the landscape. PACT started off with a threat-based analysis of environmental degradation and identified slash-and-burn agriculture, commercial hunting and indiscriminate overfishing as the principal conservation threats (Makambo, 2009).

To date, PACT has focused on the promotion of groundnuts as an alternative to slash-and-burn agriculture. Groundnuts, a nitrogen-fixing leguminous crop, were found to have high potential to grow in fallow areas already deforested thereby obviating or at least minimizing the need to clear new forest areas. Furthermore, while not yet implemented, small animal husbandry and fish ponds have been identified as two potential so-

<sup>13</sup> Participating Agencies Collaborating Together.

lutions to commercial hunting and overfishing reflecting once again the threat-based approach of PACT.

PACT has also put substantial emphasis on quid pro quo type agreements that link livelihood and conservation objectives. These agreements are formalized in the establishment of “Simplified Management Plans” (PAGS)<sup>14</sup> for CBNRM zones. In order to work more effectively with communities to develop these plans, PACT has supported the creation of local natural resource management committees as communal platforms to make decisions about conservation and livelihoods. Members sign a “charter of responsibilities” that identifies both their rights and responsibilities. In order to further increase the buy-in of local populations, PACT uses a variety of participatory research techniques that helps the communities themselves identify problems and solutions that are incorporated into the management plans.

In addition, PACT uses value chain analysis to identify the products that have a reliable market and positive profitability. However, a major constraint to all commercial livelihoods activities in the Salonga Landscape is a lack of transportation to markets due to the remoteness of the landscape, poor infrastructure and corruption. PACT is currently engaged in developing a business plan that includes transportation costs in its financial calculations and is evaluating options for improving commercialization routes. In this context it was recognized that an additional product, copal (a type of tree resin prized for its natural beauty), given its small size and high price, could be commercialized much more easily than more voluminous products and is being promoted as a livelihood alternative.

A summary of the lessons learned identified by PACT in Salonga are as follows. Support to livelihoods is a necessary precondition to conservation. Communities are very difficult to engage in the development of a management plan for improved natural resource management if material improvement in their wellbeing is not included up

front. Simply put, communities are more concerned about their daily survival than conservation. There is therefore a need to find alternative activities that harmonize the two. In addition, there is a critical need to improve transportation routes to markets. Otherwise alternative livelihood activities will lead to surplus production beyond subsistence needs and no increased revenue for local communities. Finally, there is a need to reinforce the capacities of local communities to enable them to engage in natural resource management planning decisions and attain economies of scale for the production and commercialization of products from alternative livelihood activities.

### 2.3 The Maringa-Lopori-Wamba Landscape case study

The African Wildlife Foundation (AWF) is the leader for this Landscape (abbreviated as the MLW Landscape). The MLW Consortium has a number of institutions active in alternative livelihood-related activities. AWF takes the lead on landscape planning, biodiversity conservation and conservation enterprises. The World Agroforestry Centre (ICRAF) promotes innovations in land-use practices to create alternative and additional sources of livelihoods, including the domestication of high-value and threatened tree species, and NTFP enterprise development. The World Fish Center (WF) provides expertise in sustainable fisheries management. The Netherlands development organization Stichting Nederlandse Vrijwilligers (SNV) leads on multi-stakeholder consultation and civil society strengthening. Finally, a regional NGO, the Network of African Women for Sustainable Development<sup>15</sup> (RE-FADD), focuses on gender issues throughout the landscape planning process.

The MLW Consortium uses an explicit threats-based analysis to selecting livelihood activities. Their approach began with socio-economic and biological surveys in diverse areas of the landscape. The results of these surveys were then discussed with relevant stakeholders in a “Threats and Opportunities Analysis” workshop in

<sup>14</sup> In French a “*plan d'aménagement et de gestion simplifié*”.

<sup>15</sup> Réseau des Femmes Africaines pour le Développement Durable.

2004. A central conclusion of that workshop was that, due to the collapse of marketing infrastructure, the costs and risks of the commercialization of crops such as coffee, maize, rice and cassava had increased substantially. As a result, many households had moved deeper into the forest in order to hunt forest animals which offer a higher value-to-transport-cost ratio. At the same time, these same households engage in slash-and-burn agriculture for subsistence needs in primary forest areas leading to particularly damaging environmental degradation.

As a solution to this threat-based problem analysis, the MLW Consortium decided upon a combined approach of supporting agriculture production and commercialization. On the production side, small grants to local community-based organizations helped finance the acquisition of improved germplasm, and agricultural tools. On the commercialization side, the consortium helped arrange and pre-fund a barge to transport agricultural products from the Landscape to the Kinshasa market, a distance of roughly 1500 km.

The MLW Consortium has also engaged in quid pro quo agreements with local communities in the context of land-use planning. The consortium strongly insists on the participatory nature of this approach :

*The very basis of our approach is participation of and ownership by the local communities of the landscape LUP process...final decisions depend on a participatory assessment of needs and opportunities and collaborative decision taking with the beneficiaries, who are the local communities and government (Dupain et al., 2009).*

In the context of support to agriculture, the project has worked with local communities to identify micro-zones for agricultural production outside of primary forest areas. Through quid pro quo agreements embedded in the LUP process, farmers may only receive project support if they

agree to limit their production to these agreed-upon micro-zones.

A final component of the MLW Consortium strategy is based on the interdependency linkage between livelihoods and conservation in the form of ecotourism. With support from the Consortium, the Faunal Reserve of Lomako Yokokala (RFLY) in the MLW Landscape was officially gazetted in June 2006. An agreement was facilitated with ICCN, the DRC National Parks Agency, that the local population will be involved in both the development and execution of the reserve's management plan.

The core of this interdependency strategy, according to the MLW Consortium, is to ensure that the reserve will create more benefits for local communities as a protected area with tourism revenue generated by international visitors than as a source for commercial bushmeat hunting. In order to achieve this goal, the Consortium has been constructing tourism infrastructure and has created a revenue-sharing mechanism for reserve entrance fees that will be used to fund local livelihood activities. The communities themselves will have a voice in determining the uses of these funds.

A summary of the lessons learned as identified by this MLW Landscape case study is as follows. First, the support to livelihood activities must include a public participation strategy in the context of the overall LUP strategy design and development. Secondly, the support for livelihoods must have an explicit link made to conservation such as in the case of agricultural micro-zoning to avoid further forest clearing. Finally, local capacity building is critical as in the case of small grant support to local community-based organizations even if this leads to some failures as a part of the normal learning process of the local organizations.

<sup>16</sup> Seed in the case of maize (corn) and vegetative cuttings in the case of cassava, the two crops receiving the most support.

<sup>17</sup> Institut Congolais de Conservation de la Nature.

## 2.4 Maiko Tayna Kahuzi-Biega Landscape case study

Conservation International (CI) is the leader for this landscape (abbreviated as the MTKB Landscape). Livelihood activities on the ground are carried out principally by the Dian Fossey Gorilla Fund International (DFGFI), a local community organization known as the Union of Associations for Gorilla Conservation and Development in Eastern DRC (UGADEC), and the Jane Goodall Institute (JGI). The strategy of the MTKB Consortium has centred around the establishment of an institution of higher learning, the Tayna Center for Conservation Biology (TCCB). This institution began operations in 2003 and since 2005 has been located at Kasugha, near the Tayna Nature Reserve.

This strategy described in the MTKB case study has focused on the quid pro quo agreement approach to linking livelihoods and conservation. The case study clearly states :

*One of the important pillars of this community conservation programme was that, in exchange for local communities' commitments to conservation, DFGFI would provide local development and health projects as alternative livelihoods to offset local people's opportunity costs as they ceded land use rights to create nature reserves (Mehlman, 2009).*

This quote, in fact, sums up nicely the concept of a quid pro quo linkage between livelihoods and conservation. A university by itself is not inherently linked to conservation as in the case of threat-based or interdependency linkages and therefore necessitates this type of agreement.

The selection of a university as a priority development intervention was made by a large majority of the community leaders who identified access to a centre of higher learning as their highest priority for local economic development. Several other livelihood-development activities were also prioritized by the communities and have led to the following interventions. A micro

hydro-electric station was build with support from JGI and is now providing power to the TCCB and the nearby village of Kasugha. Health interventions were also prioritized and have included important levels of support to the rehabilitation of clinics, family planning, the provision of medicine, and access to clean water. Other social infrastructure has included the construction of a road to the university, the refurbishment of schools, the construction of an orphanage and the establishment of a community radio station. Some more direct livelihood activities have included funding to agriculture, fish ponds, small animal husbandry and a brick-making project for widows.

This *quid pro quo* agreement has been firmly anchored in the participatory LUP process centred around the Tayna Reserve Management Plan. The participatory zoning plan for the reserve includes a core protected area, a buffer zone and a development zone. The TCCB complex and the adjacent village of Kasugha are located in the development zone. In addition, the MTKB consortium has put substantial effort into micro-zoning around the university and village, as the "magnet" effect of the university and various development activities has attracted substantial spin-off economic activities and entailed a certain developmental sprawl that has needed to be contained.

Some of the key lessons learned identified in this MTKB case study are as follows. First, a participatory approach is critical to achieving community buy-in. In this case study, the local community contributed substantial labour and even funding to support certain development activities because they themselves were able to establish their own development priorities. Important infrastructural investments such as the university, the hydroelectric plan and the road connection to markets have created significant opportunities for other livelihood and development activities. Early land-use planning through micro-zoning has been critical to control any potential negative impacts of uncontrolled sprawl resulting from these developments.

### 3. Conclusions and recommendations

A number of common threads have emerged from the lessons learned of these three case studies. First of all, the typology of these linkages proposed in this article proved capable of characterizing the integration of livelihoods into a conservation programme. However, it should be noted that this does not imply the different types of linkages are mutually exclusive. On the contrary, in the case studies they often proved mutually reinforcing as in the case of threat-based agricultural production being linked to a quid pro quo land-use micro-zoning. Even when they were not explicitly linked, the landscape projects are typically undertaking more than one type of livelihood-conservation linkage. This typology does, however, facilitate the integration of livelihoods into conservation programmes by allowing a clear identification of the different types of positive linkages.

In this typology, both the threat-based and interdependency categories had direct and inherent links to environmental conservation. In this specific sense, they are preferable to the quid pro quo-based approach. However, a quid pro quo approach allows greater flexibility to respond to local communities' priorities, such as the case of the MTKB case study where education and health were identified as higher priorities. In practice, all these categories of alternative livelihood activities should be considered and the approach or combination of approaches that makes the most sense, given the local context and including local community priorities, should be adopted.

All three case studies made reference to the concept of opportunity costs of conservation. Perhaps the MLW case study summed this up the most eloquently when it stated that the core of their strategy with the Lomako Reserve was to create more benefits for local communities as a protected area with tourism revenue generated by international visitors than as a source for commercial bushmeat hunting. This objective should be true of any alternative livelihood strategy. It is not enough that an alternative livelihood activity be beneficial, it must be more beneficial than the

current environmentally degrading activity it is intended to replace. For example, while slash-and-burn agriculture may be very environmentally destructive and offer low yields per hectare, it is not necessarily an irrational strategy by rural households. In land-abundant environments such as the Congo Basin, this type of agriculture gives high returns to relatively scarce labour and capital. In order for agricultural alternatives such as groundnuts in the Salonga Landscape planted in previously cleared fallow areas to give a higher return, they need market access so farmers increase their incomes. The interpretation of farmer resistance to adopting alternative livelihoods often reflects either an underestimation of the real opportunity costs of their current environmentally destructive livelihood practices or an overestimation of the benefits of the sustainable alternative.

On this last point, all three case studies found that integration into markets was critical for promoting improved livelihoods. Most improved livelihoods aim to increase production beyond basic subsistence needs, whether in the case of agricultural crops, livestock or NTFPs. If the producers of these goods do not have access to markets then indeed these alternative livelihoods will likely be less attractive than their current destructive activities. Conservation areas tend to be in relatively remote areas with poor access to markets. Attention to market integration is therefore all the more necessary. Nevertheless, many alternative livelihood activities associated with conservation projects have focused on the production side to the neglect of commercialization issues. This oversight typically leads to failure and, all too often, a misguided blaming of rural household resistance to change.

The linkage to markets, however, is not without risks. Indeed improved market access can easily lead to increased commercial hunting of fauna or forest clearing for agriculture. This is a key reason why in all of the case studies the livelihood activities were firmly embedded in an overall LUP process. Admittedly this does reflect the approach required by the USAID/CARPE management team. Nevertheless, all the case studies found that land-use planning such as the establishment of core protected areas or agricultural micro-zones was a necessary component of en-

ensuring coherence between livelihood and conservation objectives.

A final common thread of all the case studies was the need for participatory approaches and local capacity building. Choosing alternative livelihoods solely on the basis of their potential conservation benefits is highly likely to fail if they don't take into account local communities' priorities. Furthermore, capacity building is almost always necessary in order for local communities to agree upon complex decisions about the use of their natural resource base. Natural resource degradation caused by population pressures is often a relatively new phenomena necessitating not only the adoption of new livelihood alternatives but also new governance mechanisms for establishing rules and regulations about natural resource use. Traditional approaches to these changing circumstances are frequently not adequate and therefore capacity building is essential.

As a final conclusion, it is hoped that with the detailed analysis of livelihood-conservation linkages backed up by the concrete examples from the case studies, this article makes the case for those still in doubt of the need for a people-centred approach to conservation that includes livelihoods as an integral part of a conservation programme.

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