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## HOW TO INTEGRATE A GLOBAL ISSUE OF FOREST CONSERVATION WITH LOCAL INTERESTS: INTRODUCTION TO THE SATREPS PROJECT IN SOUTHEASTERN CAMEROON

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**ABSTRACT** Conservation of tropical rainforests, with their rich biological diversity and high potentials for carbon sequestration, has become a major global issue. While Cameroon has witnessed an increase in the number of protected areas in the southeastern part of the country during the past 15 years, this has resulted in the restriction of access of local people to the forest. Since the new forest law in 1994, most parts of the forest in Cameroon have been divided either into protected areas, or forest management units subject to current or future logging operations. There is a growing conflict between the global issue of conservation and the interest of the local people in their livelihood. The Scientific and Technological Research Partnership for Sustainable Development (SATREPS), a Japanese overseas cooperation project, addresses this issue through establishing a sustainable use of Non-Timber Forest Products (NTFPs) among the local people, which is compatible with the conservation of tropical forest. In this paper, the outline of the SATREPS project is described, and some of the interim outputs from the Projects are presented.

**Key Words:** NTFPs; Sustainable use; Local livelihood; Interim reports.

### IMPORTANCE OF THE FORESTS TO GLOBAL AND LOCAL COMMUNITIES

Since the Lio Summit in 1992, conservation of biological diversity has attracted a global interest, and conservation of tropical rainforests, which accommodate rich biological diversity, has become a major global issue. Tropical rainforests in central Africa also play an important role of carbon sequestration, which is expected to mitigate the global climate change. In central Africa, these concerns have come out as massive movements toward conservation of the rainforests. Conservationists, such as WWF (World Wide Fund for Nature) and other international NGOs have been actively promoting the projects, which aim at establishing protected areas for the forest ecosystem and faunal and floral diversity. In Cameroon, the Lobéké area in Eastern Province was declared a national park in 1999, following a recommendation from WWF. In the same year, a protected area of tri-national parks was formed, comprised of Lobéké in Cameroon, Dzanga-Sangha in Central African Republic, and Nouabalé-Ndoki in Republic of Congo. To the west of Lobéké National Park, Cameroon and Gabon have been working on the Tridom project to create a tri-national “interzone” bordered by the Minkebe, Boumba-Bek, Nki, and Odzala National Parks and the Dja Wildlife Reserve. Projects such as these have created a network of protected areas over the last 15 years. The areas protected for wildlife conservation in Cameroon now cover more than 7 million hectares, accounting for 15% of national territory (Topa et al., 2009).

However, this means, to the people who have been living in the forest, that they are deprived of their means of livelihood. In fact, the access of the people is restricted to the forest resources which they have been customarily using for many centuries. This is really a problem for the local or indigenous peoples, since they have no other means for making their living. We have to find out a way, therefore, to integrating the global issue of forest conservation with the need of local people to secure means of livelihood and to contributing to their poverty reduction. I will introduce here our approach to this problem, that is, on the reconciliation between the global issue of forest conservation and the local issue of peoples' livelihood.

The Congo Basin Forest covers an area of approximately 150–170 million hectares, which stores at least 30–40 billion tons of carbon (Debroux et al., 2007). It is the second largest tropical forest block in the world, after the Amazon. The forest in this region attracts global attention for various reasons. First, it is valued for its wood resources, which comprise one of the major export products and are expected to bring substantial national revenue. Second, it is important in terms of biological diversity, which is the first in Africa in the diversity of mammal and bird species, and third in floral diversity (Debroux et al., 2007). There are also rare and endangered species, such as gorillas, chimpanzees and bonobos (smaller relatives of chimpanzees), okapis, leopards, forest elephants, and so on. Thirdly, there is a growing interest in the forest for its global environmental services; in particular, in the forest as carbon sequesters, because tropical forests store about 200–300 tons of carbon per hectare of forest area (according to the report of UNEP, cited in Debroux et al., 2007). There are, therefore, good reasons for a global concern for the forest conservation in this region.

However, there are in this region about 60 million local people who depend heavily on the forest resources for fuels, food, medicine, tools and ornaments, and other material culture. In particular, there are so-called “indigenous peoples” who are most dependent on the forest resources, but underprivileged, compared with other peoples, in social, economic and political aspects. Therefore, the problem is how to reconcile these opposing interests; in the global concern for conservation on the one hand, and interests of local people in maintaining and improving their livelihood, on the other.

Concerning the issue of forest conservation, there was an important international movement. The UK government issued a report in 2006 on the climate change and its effects, titled as “*The Economics of Climate Change*” (Stern, 2007) which is also called, “*The Stern Review*.” According to the Review, the action for reducing CO<sub>2</sub> emission is necessary, and also economically viable. The problem is NOT just the conflict between “economy” and “environment.” Even from an economic point of view, conservation of the forests is necessary (Ichikawa, 2014). There has been a new scheme, called REDD that stems from the recognition of environmental services provided by forests. It is to assist developing countries in their efforts to reduce emissions from deforestation and degradation (REDD) by providing value to standing forests.

There are risks in this scheme, however. Conservation of forests may bring enormous economic benefits to the recipient countries. If there is no adequate

consultation with the local people, nor appropriate management of the benefits from this scheme, it may not bring intended benefits for the poor people, especially for the forest-dependent indigenous peoples (Oliver, 2008; Ichikawa, 2014). Moreover, it would worsen the conflicting relationship between conservation groups and forest-dependent populations, and eventually lead to the expropriation of indigenous forest people, and violation of their customary rights.

However, we think that there may be a way to combine forest conservation with local people's needs. That is, the use of Non-Timber Forest Products (NTFPs). The use of NTFPs, which are extracted from living trees and animals depending on them, is compatible with carbon sequestration and other environmental services, so far as it does not deteriorate the forest ecosystem. It will enable us to integrate the global issue (REDD = reducing emission from deforestation and degradation) with local welfare (mitigating poverty through exploiting economic value of NTFPs).

There is a problem of sustainability of forest resource use in this scheme. The sustainability of the resource base is most likely to be endangered by over exploitation in a state of free access to the resources, according to the theory of "tragedy of the commons" (Hardin, 1968). We think that the sustainability is realized through securing the people's customary rights to the forest and its resources. If free access by the outsiders is restricted, the local people would be able to avoid excessive competition and eventual over exploitation, based on a long term sustainable management plan.

The aim of the SATREPS (Scientific and Technological Research Partnership for Sustainable Development) project addresses these issues through a project in southeastern Cameroon. I will describe this project, which aims at establishing a sustainable livelihood strategy, while conserving the forest ecosystem.

## THE RESEARCH PROJECT

### I. Aim of the Research

The STAREPS project aims at establishing a system for sustainable use of forest resources, which would provide the local people with an alternative forest use to industrial logging. It is focused on NTFPs. NTFPs are comprised of fruit, leaves, bark and roots that are produced by plants, and also include animals which depend on the forest plants. Since the NTFPs are produced by living trees in most cases, the use of such resources is compatible with the forest conservation, unlike the use of wood which is the final and dead form of tree products. In other words, it is the use of "interest" (forest products) without damaging the "capital"(trees that produce the products).

The Project is promoting the research on the (1) ecological potentials, that is, distribution, abundance, seasonal/annual changes and regeneration of NTFPs in the forest, (2) the importance of NTFPs to the livelihood and household economy of the local people, and (3) on a social system that enables the people to use the

NTFPs on a sustainable basis by avoiding excessive competition over the resources. Based on the results from these studies, it ultimately aims at establishing a co-existing relationship between forest conservation and life of the local people. While various studies have been carried out on the NTFPs and people's livelihood in the central African forests, there have been few studies that cover such a range of research in a single project. We think it necessary to conduct an integrated, systematic research on the forest ecology, people's subsistence and household economy, and social systems for sustainable management.

We do not think, however, that the problems of the forest conservation could be solved within the forest sector alone. The forest conservation, in particular in Africa, must be supported by enhancing human carrying capacity outside the forest through intensification of agriculture, which would eventually mitigate the expansion of agricultural lands into the forest areas. In other words, it is necessary to take a landscape approach, which combines different types of land use, in addition to protected forest areas, in order to properly address the issue of forest conservation.

## II. Outline of the Research

### (1) Study site

The study site was selected in the area around Gribé village, Department of Boumba-Ngoko in the East Region. We selected this site for various reasons. The first reason is its location, that is, proximity to less-disturbed forest. The site is surrounded by protected areas (Boumba-Bek and Nki National Parks) on the one hand, and forest management units (FMU) which are allocated to either current or potential logging operations, on the other. The people are trapped between conflicting demands for conservation and development, and suffer from the loss or restriction of their access to the forest and its resources. The second reason is the characteristics of the village that consists of two major ethnic groups, the Konabembe (Bantu-speaking people) farmers and the Baka hunter-gatherers, who are supposed to have different relationships with the forest, and whose populations are approximately the same, i.e., 300–400 individuals each. Their population size is suitable for a comprehensive research. There are also logistic reasons, access to road networks, and distance from the unstable border areas.

The actual research consists of the following activities (Woin et al., 2012).

### (2) Construction of research station

The first activity is to construct a research station in Gribé village. The station will be used for storing the research equipments, as well as meeting space for holding on-site seminars, etc. Since the forest land is designated as state property in the Cameroon forest law of 1994, the construction site was allocated with the co-operation and approval of the local government. Building materials, techniques and labor required for the construction were sought in the locally available resources as far as possible (Yasuda et al., 2014).

(3) Survey on the ecological potential of NTFPs

The research on the flora and fauna is carried out. In particular, the surveys on vegetation composition, and animal distribution and abundance are carried out with transect and quadrat methods. Abundance, regeneration status, seasonal and annual changes (phenology) in the fruiting of major NTFP species are also documented.

(4) Use of NTFPs and their importance to the livelihood of the local people

The resources that the Konabembe, Bantu-speaking shifting cultivators, and the Baka hunter-gatherers, extract from the forest as materials of their livelihood are recorded. The major NTFPs species are identified and the importance of NTFPs to livelihood and household economy is evaluated. For animal resources, hunting activities and bushmeat market activities are surveyed in order to assess the sustainability of hunting.

(5) Creation of NTFPs database (AFlora database)

Along with the vegetation survey, ethnobotanical surveys on local names and usage of NTFPs are carried out. The ethnobotanical information will be stored in a network-type database called AFlora (Kimura, 2013).

(6) Nutritional analysis of NTFPs

The nutritional composition of edible wild plants is analyzed.

(7) Creation of the resource distribution map and participatory mapping of forest resource uses

This is to collect the data for creating the maps that illustrate the distribution of different types of land use including cultivated lands and fallows, and of forest resources. Individual trees remaining in the abandoned and active field plots are also documented. These maps are to be used for establishing a social system for sustainable resource management. At the same time, the overlapping relationships among the people over the land and resource uses will be shown through visualizing the peoples' use of spaces and resources.

(8) Social system for the sustainable use of NTFPs

A social system is sought for mitigating the excessive competition over the resources among the local people, based on the map created above. For this purpose in mind, various social organizations of the village are investigated.

## THE CONTENTS OF THIS ISSUE

This supplementary issue is based on the results from some of the studies mentioned above. It consists of the interim reports of the research conducted around Grike village and its neighboring areas.

The first part is comprised of the papers on the ecological potentials of NTFPs. The report by Tajeukem et al. describes the species composition, vegetation structure

and plant diversity on the northern periphery of the Boumba-Bek National Park, using a 16.4 km-long baseline from the village to the park border, along which 16 transects with 5 km long and 5 m wide were set on both sides of the baseline. From comparisons between different transects belonging to different types of land use, they suggest that the current level of cultivation with long fallow and NTFP use by the local people have little negative impacts on the floral diversity.

While there have been many studies on NTFPs, most of these have concentrated more on socio-economic issues than their biology. Because of their importance to local livelihood and biodiversity conservation, there is a need to investigate the ecological potentials of NTFPs. There are plenty of cacao gardens in the study area, in which various trees are left uncut to provide the cacao fields with favorable shades. Penanjo et al. conducted the survey on the tree species composition of the cacao agroforests in a total of 40 cacao garden plots of different ages, and found that the tree diversity increases with the age of the garden. They also pointed out that the majority of these trees are useful as food, medicine and other materials of the people's life, and that some of these are important NTFP species.

Hirai gives a brief description on the seasonal and annual changes in the production of some of the major NTFP species in part of the last chapter of this issue. He set simple traps under the NTFP trees, four traps each under each of 6–25 individuals of 10 major NTFP species, and counted the numbers of ripe fruit dropping into the traps on a weekly basis. In this way, he has been recording the seasonal/annual changes in fruit production for clarifying the various fruiting patterns of the major NTFP species. Based on the preliminary results, he suggests that the changes in fruit production affect the people's subsistence and household economy. As the phenologies of the trees in the tropical rainforest are extremely complicated, Hirai plans to analyze the influences of the phenologies on the livelihood in more detail in a forthcoming paper.

In order to maintain the ecological potentials of NTFP species, regeneration of the NTFP species is indispensable. Fongnzossie Fedoung et al. surveyed the density, population structure and the status of natural regeneration for eight of the major NTFP species (*Afrostryax lepidophyllus*, *Baillonella toxisperma*, *Irvingia gabonensis*, *Panda oleosa*, *Pentaclethra macrophylla*, *Ricinodendron heudelotii*, *Scorodophleus zenkeri* and *Tetrapleura tetraptera*) which are highly important to their subsistence and household income. They observed that some NTFP species, such as *Afrostryax*, *Ricinodendron* and *Pentaclethra* have a higher density and numerous seedlings and immature individuals, whereas other species like *Baillonera* have a much lower density, in particular of seedlings, saplings and young trees, and emphasize that these latter species need a special care for conservation and regeneration.

As to the fauna in the study area, Bobo et al. provide the basic data on the abundance and spatial distribution of large and medium-sized mammals in the northern periphery of Boumba-Bek and Nki National Parks. Their survey was carried out on a total of 397.9 km survey line, and 31 large and medium-sized mammal species were recorded. They point out that relatively high densities of threatened species such as gorilla and elephant indicate the potential of this area for biodiversity conservation, whereas human activities were widely observed in



the study area, and may affect the mammal abundance negatively.

Yasuoka studies the major game abundance and hunting by the Baka and other forest peoples in the Congo Basin. While the major hunting targets in the region have been thought to be several species of duikers, Yasuoka points out that there is a difference in the relative abundance of red duikers (larger-sized duikers) and blue duikers (smaller-sized duikers) in different areas of the region. According to him, where larger-sized red duikers are relatively abundant, hunters use spring traps adapted to capture larger duikers, whereas net hunting is used in the area with more abundant blue duikers. In this way, he shows the difference in the major hunting methods employed by the peoples in this region, and discusses how these differences are affected by the relative abundances of the game species.

The use of NTFPs in the livelihood of the Baka has been investigated by Hirai, who recorded all the livelihood materials brought into the settlement. The commercial transactions of NTFPs are also recorded in order to evaluate their importance to household economy. From these studies, major NTFPs in their livelihood and household economy are identified, and their importance is evaluated. This research is carried out on 25–30 Baka households with the assistance of literate Baka people. The involvement of the local people in the research activities, coupled with sharing of the results and their implications, would certainly contribute to the capacity development of the local people in coping with the forest issues.

In order to establish a social system for sustainable management of forest resources, we must also know the social relationships of the local people. Toda provides basic information of the people and societies of the Gribé village, including population, kinship and various other social organizations, and history of the village. These kinds of information are indispensable to establishing a social system for the forest and resource management.

Hirai also investigates the cultivated field plots in Gribé village by employing GPS/GIS methods. He collected the information for a total of 3,911 cultivated plots, both active and abandoned, and tried to evaluate the sustainability of their agricultural land use. The area allocated to the Gribé inhabitants for practicing agriculture (Agroforest Zone) is estimated at 7,144.5 ha, whereas the people actually cleared for cultivation a total of 46.9 ha in the season of 2012–2013. It will, therefore, take another 150 years before a cultivated plot will be cleared again, according to Hirai's estimate. This time length is sufficient for a cleared plot to be covered again with sufficient secondary growth. Actually, more than 90% of the plots were cleared in the secondary forests, and there was little expansion of the cultivating area into the mature forest during the past several decades. This means that, shifting cultivation in the study area may be sustainable, as long as the agricultural production remains on the present level.

There are also various other studies, such as quantitative research on local hunting activities and analyses of their impacts on the animal population, trading and market networks of bushmeat in the area, and participatory mapping of forest land and resource use, among others. These are still ongoing, and the results will soon appear.



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