

FOREST HARVESTING CASE STUDY

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THE IMPACT OF TIMBER HARVESTING ON THE AVAILABILITY OF NON-WOOD FOREST PRODUCTS IN THE CONGO BASIN

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by

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FOREWORD

This case study is one of a series of publications produced by the Forest Products Service of FAO in an effort to promote environmentally sound forest harvesting and engineering practices. The purpose of these studies is to highlight both the promise of environmentally sound forest harvesting technologies as a component of sustainable forest management, and the constraints that must be overcome in order to assure widespread adoption of those technologies.

The study benefited from extensive collaboration with the GCP/RAF/398/GER: Enhancing the contribution of non-wood forest products to food security in Central Africa – a project aimed at identifying and promoting a more effective contribution of non-wood forest products (NWFP) towards improved food security in Central Africa.

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EXECUTIVE SUMMARY

The humid dense forests of the Congo Basin are of great economic importance to the six countries (Cameroon, Central African Republic, Congo, Democratic Republic of the Congo, Equatorial Guinea, and Gabon) of the region, e.g. contributing up to 18 percent to the gross domestic product (GDP) of the Central African Republic and 20 percent to the foreign exchange earnings of Cameroon. However, such revenues are calculated from timber harvesting, while the value of non-wood forest products (NWFPs) is generally not accounted for in national statistics. This failure to show the importance of NWFPs in national statistics might explain why there are few clear policy statements defending the role of NWFPs in management plans, forest codes and logging control strategies. These tools are necessary to ensure good governance and to enable a move towards sustainable forest management in the Congo Basin.

More than 36 percent of the 137 million ha of the humid forest in the Congo Basin is already within logging concessions (86 percent in the Central African Republic) and the pressure to expand is increasing. There have been advances towards more transparent concession awarding systems that follow public purchasing procedures (open bidding) and the elaboration of management plans alongside social responsibility contracts (“cahier des charges”). What remains unclear is the extent to which NWFPs of socio-economic value to local people are taken into consideration in these guiding documents as well as how to ensure that logging companies respect the specifications relating to such products.

This study seeks to address the above concerns by examining the impact of timber harvesting in two villages, one in Cameroon and one in the Central African Republic. It documents many plant-based and animal-based NWFPs of great significance to the livelihoods of the local populations in terms of food security, income generation and health.

With regard to the impact of logging on NWFP availability, the study finds that the greatest impacts have been on tree species with NWFP values that are extracted by the timber companies. Timber exploitation also leads to the destruction of secondary trees and understory species that furnish NWFPs. Damage is associated with tree falls and the passage of heavy machines that also destroy NWFPs. Apart from a few NWFPs that benefit from logging-induced microclimate changes at the forest floor, most plant-based NWFPs decrease in availability following logging. With regard to the availability of animal-based NWFPs, the overall trend is also one of decline after logging.

The forest of the Congo Basin is a major economic asset for national governments, local communities and economic operators. With the drive towards sustainable forest management, it would be ethical to take into consideration all stakeholders in designing policy, management and control tools that minimize the negative impacts of logging and encourage multiple benefits from a greater array of forest products. The study recommends that policies governing forest exploitation should:

- ensure that timber companies establish a platform where local communities’ voices can be heard;
- arrange for the local population, the administration and the logging company to work together to draw up social responsibility contracts and clarify the role of NWFPs in management plans;
- create agroforestry zones that would enable local people to operate in their own domain while the logging company operates on its own area, thereby reducing conflict;
- ensure systematic multi-resource inventories especially of timber species with NWFP values;

- help develop alternative activities of interest to the local population;
- involve local non-governmental organizations in the overall strategy of education and information dissemination on the rights of all stakeholders;
- ensure proper monitoring of logging activities;
- improve forest governance and reduce illegal logging;
- minimize disparities in the forest policies of the Congo Basin countries.

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LIST OF ACRONYMS

ATO	African Timber Organization
CEFAID	Centre pour l'Education, la Formation et l'Appui aux Initiatives de Développement au Cameroun
CIFOR	Center for International Forestry Research
COMIFAC	Forestry Commission of Central Africa
FAO	Food and Agriculture Organization of the United Nations
FMU	Forest Management Unit
GDP	Gross domestic product
GNP	Gross national product
GPS	Global Positioning System
GTZ	Gesellschaft für Technische Zusammenarbeit (German development agency)
MEFCP	Ministry of Water, Forest, Hunting and Fishing
MINEF	Ministry of Environment and Forestry (now MINFOF)
MINEFI	Ministry of Finance
MINFOF	Ministry of Forestry and Wildlife
NGO	Non-governmental organization
NWFP	Non-wood forest product
PCI	Principles, criteria and indicators
PEA	Exploitation and management permit
PTE	Temporary exploitation permit
RRA	Rapid rural appraisal
SBB	Bayanga Wood Company
SSV	Sale of standing volume
STD	Sexually transmitted diseases
WWF	World Wildlife Fund

CHAPTER 1

BACKGROUND

The Food and Agricultural Organization of the United Nations (FAO) commissioned this study by the Center for International Forestry Research (CIFOR) as part of a long-standing collaboration between the two institutions on research and development in the forestry sector of the Central African subregion. Within the context of FAO, the study was conceived as a joint activity between the FAO Forest Impact Assessment Regular Programme and the FAO Project “Enhancing food security through NWFP in Central Africa” (GCP/RAF/398/GER) funded by the German Government. Results from the study were considered relevant in setting concrete recommendations that could contribute to the integration of non-wood forest product (NWFP) management in sustainable forest management systems and strategies.

For the purpose of this study, NWFPs are defined as: “*products of biological origin other than wood derived from forests, other wooded land and trees outside forests.*”

Tropical forests are home to more than 50 percent of the world’s terrestrial animal and plant species. Furthermore, 80–90 percent of the 1 200 million people living in extreme poverty worldwide depend on a variety of NWFPs for their livelihoods (Roerhorst, 2006). However, most economic appraisals of tropical forests have focused exclusively on timber resources or the possible creation of agricultural land. The importance of NWFPs tends to be underestimated because most are not traded through established market channels and do not appear in national economic statistics. As a result, NWFPs often remain beyond the vision of policy-makers and development planners in most of the tropical forest world, and in the Congo Basin in particular.

The forest of the Congo Basin has received special attention from member states of the Forestry Commission of Central Africa (COMIFAC) and from the international community because of its biological diversity and impact on global climate. The total population inhabiting this region is slightly more than 78 million people, giving an average population density of 5.1 inhabitants/km² and a forest area of 2.9 ha/person (FAO, 2005).

The humid dense forest of the six countries of the Congo Basin (Cameroon, Central African Republic, Congo, Democratic Republic of the Congo, Equatorial Guinea, and Gabon) covers a total surface area of 137 million ha, of which 49.4 million ha (36 percent) had already been allocated to forest concessions by 2004 (Karsenty, 2005). A higher proportion of 45%, representing 82.2 million ha of concession area was estimated by Minnemeyer (2002) for both the dry and humid tropical forests of the Congo Basin. The total area allocated to concessions in the Congo Basin hides the disparity in percentage terms between the six different countries. For example, for Cameroon, Congo, Gabon, Central African Republic and Equatorial Guinea, the share of humid dense forest within logging concessions is 45, 77, 80, 86 and 93 percent, respectively. The Democratic Republic of the Congo has 16 million ha of its humid forest within logging concessions, representing 18 percent of the country’s humid forest but more than 32 percent of the total concession area in the six countries of the Congo Basin. The above statistics suggest that forest concessions form a major land use in the forest of the Congo Basin.

Forest concessions are a major land-use type in the permanent forest domain of most countries in the subregion. They are not solely timber factories. They are inhabited or surrounded by many families that have depended for generations on NWFPs from the same forests for subsistence, health, shelter and/or income. Logging, the most important activity for forest concessionaires in the Congo Basin, alters the primary structure and composition of the forest as well as its

accessibility. This has been documented as affecting the availability of NWFPs and the livelihoods of those dependent on them (Ndoye and Tieguhong, 2004). Therefore, this study on the impact of logging was carried out in order to provide information on the potential or actual changes that occur in NWFP quantity and quality after logging. The study objective took into account existing publications in order to present updated information in the light of recent developments and perceptions about the impacts of timber concessions and timber harvesting activities on the availability of NWFPs for communities. It also took into account recent progress in forest management policies that deal with this issue. Cross-checks were made on: timber species exploited by timber companies, volumes exploited over recent years, timber species of NWFP value, and the social obligations of logging companies. Such information was considered useful in guiding and informing decisions on resource use and/or setting forest management strategies that would include NWFPs.

In order to generate the data and information required to meet the objectives of this study, the following specific tasks were carried out:

- Assessment of current legislation with respect to the obligations of timber concession holders concerning the protection of NWFPs within their concessions and community access to these (where relevant) for subsistence and/or commercial purposes.
- Identification of potential and actual social, economic and environmental conflicts in policies of forest management relevant to timber harvesting and the harvesting of NWFPs from the same areas (i.e. forest concessions).
- Assessment and analysis of the impacts of logging activities on the availability and accessibility on NWFPs based on the perceptions of different stakeholders, i.e. local communities, timber companies, national administrative staff in charge of forests, and non-governmental organizations (NGOs).

For the subsistence economy of forest-dwelling people, NWFPs offer an important source of food, shelter, household equipment, forage and medicine. Efforts to further develop markets for NWFPs, such as fruits and nuts, natural oils, latex, rattan, bamboo, orchids and similar products, are designed in part to provide alternative income from the forest to a broader range of stakeholders rather than income from timber harvesting alone (which is largely controlled by timber companies). This means that identifying, protecting and managing the Congo Basin's forest for a broader range of values than timber alone would be more desirable in future.

CHAPTER 2

METHODOLOGY

DESCRIPTION OF STUDY SITES

For this study, two case studies were undertaken in two villages: Zega in Cameroon, located in a logging concession owned by ALPICAM; and Nguengueli in the Central African Republic, located at the periphery of the northern border of the Bayangan Forest. Two dominant indigenous ethnic groups inhabit the study sites. These are the Bantus (a predominantly farming population) and the pygmies (predominantly forest-centred hunter-gatherers). The Bantus are known as Bilos in Bayanga (Central African Republic) and Bangando or Bakweli in Zega. The pygmies are popularly known as Baka in Zega, and Ba'aka or Bayaka in Bayanga. Their population is estimated to be between 8 000 and 20 000 people (Jackson, 2004). The term "pygmy" is used by indigenous activists and supporters as a general and widely understood term to emphasize commonalities between the estimated 500 000 indigenous forest hunter-gatherers and former hunter-gatherers of central Africa. It is also used to distinguish them from other ethnic groups who may also live in forests but have a greater reliance on farming, and who dominate pygmy people in economic and political life. Many pygmy peoples refer to themselves as "people of the forest" and see themselves as distinct from their settled farming neighbours, whom they call "village people" and in some cases *patrons* because they are deemed to "belong" to the neighbouring Bantus, and so do not have independent representation in administrative and legal matters (Abéga, 1998).

In both Cameroon and the Central African Republic, the pygmies are known as prior occupants of forest. They have extensive traditional forest-related knowledge of forest ecology, wildlife and plants (including medicinal plants). This forms an integral part of their cosmology and their holistic view of the forest and themselves as being intimately connected and indivisible (Jackson, 2004). The forest lands and resources on which their subsistence economies depend are coming under increasing pressure from the expansion of logging and conservation areas and the encroachment on forests by the expanding farming population. These trends pose a continuing threat to indigenous peoples' traditional forest-related knowledge. Many have become increasingly dependent on subsistence agriculture for survival, either working on their own plots, or through labour provision for neighbouring Bantu farmers. However, both ethnic groups cohabit peacefully without open confrontations or conflicts.

THE ZEGA SITE IN CAMEROON

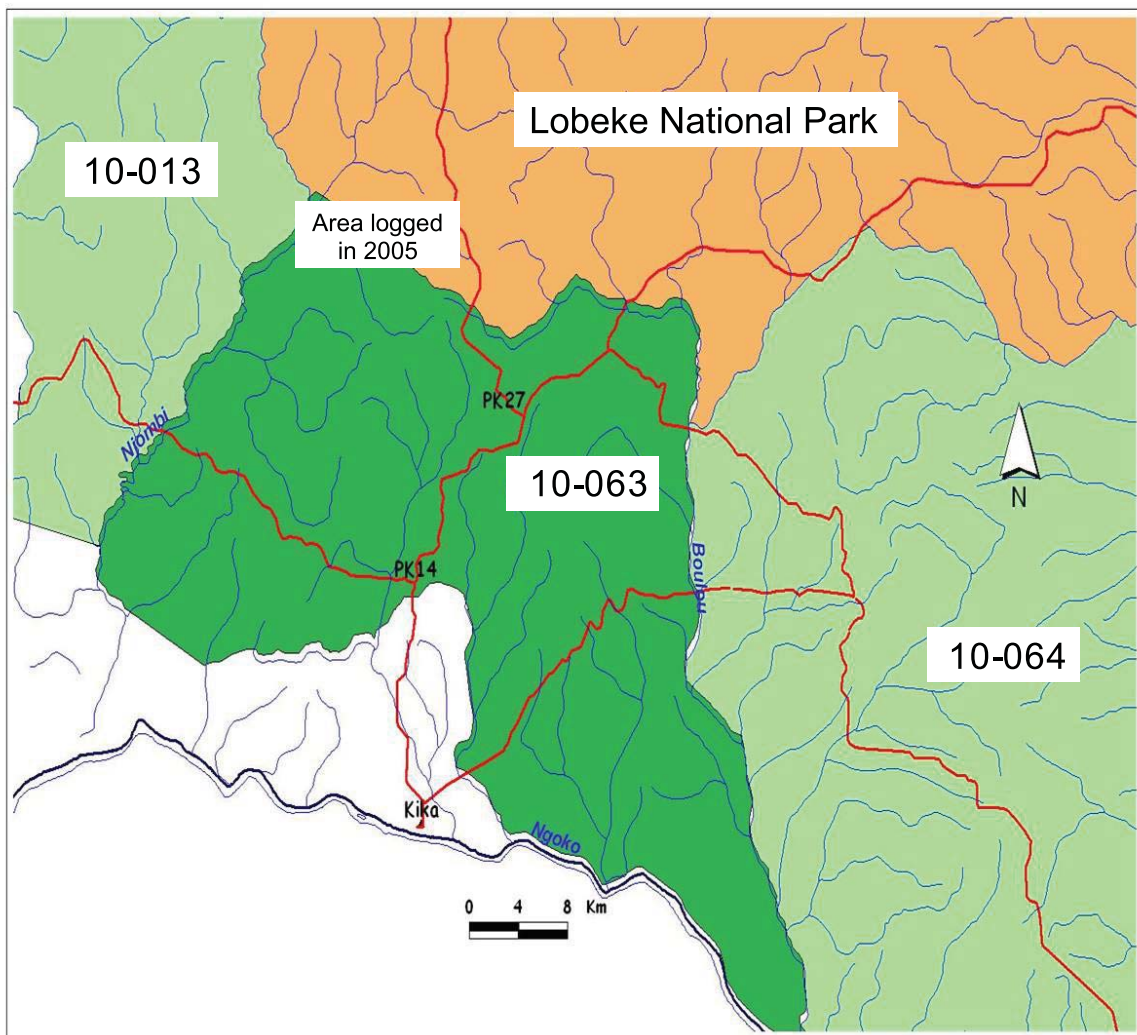
The first case study (Zega case study) was carried out in Forest Management Unit (FMU) 10-063 in southeast Cameroon (Figure 1). The total area of the forest concession (FMU 10-063) is 68 933 ha, located between latitude 1°45'–2°10' N and longitude 15°30'–15°50' E. Zega is located in Moloundou Subdivision of Boumba and Ngoko Division. The village was established in its present location 18 years ago. It lies about 14 km from Kika and about 60 km and 250 km from Moloundou and Yokadouma, respectively. Zega is bounded to the south by Kika at the Bango stream, to the west by a village called Ndjombi, to the north by the Lobeke National Park and by FMU 10-064 to the east.

History of Zega

History holds that the first chief of Zega was the founder of the village Zega, which means families that come together and live on natural resources. He was attracted to the site by its location at a road junction and by the fertile soils. From Kika to Mbendja before the River Ngoko was the “promised land” where the chief and his friends carried out hunting, fishing and gathering of NWFPs. Within this region, he found the long-present forest-dwelling Baka people, who were also accustomed to hunting, fishing and gathering. Together, they formed the village of Zega. The founding chief died in 2001 and was succeeded by his nephew, who is the interim acting chief (another chief will be installed following village norms). The population of Zega is estimated at 350, of whom 24 percent are Bantu (Bangando and Bakwele), 75 percent are Baka and 1 percent are from other parts of the country.

The village lacks a school, health centre, potable water, and electricity. Moreover, the village was ignored in the process of delimiting the permanent forest domain of Cameroon. As a result, more than three-quarters of the village is located within FMU 10-063.

FIGURE 1
FMU 10-063 and the position of Zega



THE NGUENGUELI SITE IN THE CENTRAL AFRICAN REPUBLIC

The second case study (Nguengueli case study) was carried out in the northern border of the Bayangan Forest, owned by the logging company called Bayanga Wood Company (SBB), in the Central African Republic. The village of Nguengueli was created before 1972 (before the arrival of Catholic missionaries in Monassao) by Ba'aka people. These people migrated from the road leading to the Salo sector where Baboungue, Ngola and Kandja are today. With the opening of the Bayanga road, the village became established in its present location. The current chief of the village is Bongo Gervais. The economy of the village is based on hunting, collecting forest products, agriculture and livestock rearing. The village is bordered to the north by Monassao, Kandongo to the south, Salo to the west and Gokosso to the east, a site for small-scale diamond exploitation.

The SBB operated in the Dzanga-Sangha Dense Forest Reserve (3 150 km²). This logging company started its operations in Nguengueli village in 2004 but stopped them after six months. This forest falls within the Southwest Block of the tropical moist forest of the Central African Republic and is inhabited by more than 20 000 indigenous people, mostly Ba'aka (pygmies). Major villages include: Mossapoula, Lidjombo, Bayanga, Nyangoate, Bonadjukou, Mongambe, Yandoumbe, Nguengueli, Monassao, Kandongo and Salo. The exploitation of timber in this region has a sporadic history and has witnessed the presence of some five companies with different exploitation titles.

RESEARCH METHODS

Instead of conducting in-depth and time-consuming ecological studies (population ecology and ethnobotanical studies), the decision was taken to conduct an evaluation of community perceptions of changes related to the availability of NWFPs before and after logging. Rapid rural appraisal (RRA) tools were used to outline: (i) the overall perception of logging in two randomly selected villages around two forest concessions (one in Cameroon and one in the Central African Republic) where logging had recently been carried out (not more than one year before the study); and (ii) the effect of logging on the availability of plant-based and animal-based NWFPs. In each village, the population was divided into four focus groups based on age, gender and ethnicity (Baka in Cameroon or Ba'aka in the Central African Republic, and Bantu in Cameroon or Bilo in the Central African Republic). Similar semi-structured questions were asked in each group as a form of triangulation exercise, and the information gathered was synthesized and corroborated at a general meeting. In addition, meetings were held with local administrative authorities in charge of forest management as well as with resource persons from logging companies operating in the concessions under study. Secondary data on timber species exploited and volumes as well as past socio-economic studies in the regions were also explored. The management plans and "cahier des charges" (social responsibility contracts) of logging companies were consulted in order to discover their social responsibilities with respect to local people living close to forest concessions.

The method employed in this study was an adaptation from the work done by Menton (2003) in the Brazilian Amazon. Key elements used included meetings with local institutions followed by 12 days of RRA activities in the two villages. In order to ascertain the impacts of logging activities on the availability and accessibility of NWFPs, the views of villagers, local forest administrators and logging companies were solicited. Two sets of semi-structured questionnaires were developed and used as a guide during the study; one set for logging company personnel and local administrators in charge of the forest, and the other set for the focus groups in the villages. Specific activities included:

- Key informant interviews. Interviews were conducted with staff of institutions active in the region in order to obtain background information on study villages, villagers and the activities of logging companies.

- Introductory meetings were held with village communities in order to obtain information on study objectives and to encourage participation in the study.
- Community mapping. The 4–6 key informants were asked to map community lands and important forest features. Maps were presented to the entire village and discussed and adjusted at the final general meeting.
- Reconnaissance walks were conducted with 5–6 villagers (composed of both Bantu and Baka people) in order to identify and discuss resource-use areas and observe logging damage. Specific damages were noted and later discussed and Global Positioning System (GPS) points were recorded for major areas where villagers collected specific NWFPs. Personal observation served as a major tool during this process.
- Formation of focus groups. Focus groups were formed based on the composition of the village in terms of age, gender and ethnicity as well as on the level of interaction within groups. For example, the four focus groups identified in Zega were: Bantu men, Baka men, Bantu and Baka women together, and Bantu and Baka youths together. The Baka men were separated from the Bantu men because, when there were together, the former would not speak. This was not the case with the women and the youth groups that were a combination of Bantu and Baka.
- Species selection. In each focus group, members were asked to list the NWFP species used in two categories: (i) plant-based NWFP species; and (ii) animal-based NWFP species. They were asked to give their perception on the availability of the products listed before logging activities started and after the logging company had departed the specific site. For plant-based NWFPs, the groups were asked to make estimates of monthly (or weekly) productivity, village-wide pre- and post-harvest rates, local prices and the extent of product marketing. The groups were asked for their impressions of NWFP species variation in productivity or harvest rates after logging. For animal-based NWFPs, the groups were asked to estimate monthly (or weekly) hunting rates for the village before and after logging and to give reasons for the increase/decrease or lack of change.
- General perception of logging. Groups were asked to list the advantages and later disadvantages of logging operations in a forest of interest to them and to state possible solutions to problems that may seem to surface.
- Corroboration of results. A general meeting with all the groups involved was conducted in order to corroborate the perceptions of villagers as well as the resource-use map, and adjustments were made accordingly.

CHAPTER 3

POLICIES GOVERNING NWFP MANAGEMENT IN FOREST CONCESSIONS

Forestry policies have only recently begun to take into consideration the value of NWFPs in the overall management strategies of tropical forests at national and regional level. The FAO regional code of reduced impact of forest harvesting for Central and West Africa proposes that multiresource zoning plans should be an integral part of overall forest management plans and that customary products gathered from the forest for various socio-economic interests such as NWFPs should also be taken into account. This might have policy implications of leaving out heritage trees (trees identified before and kept during harvesting, utilized by the local population for nutritional, cultural or religious purposes) (FAO, 2004). The forestry policy-makers of countries in the Central Africa subregion are becoming aware of the socio-economic role of NWFPs in the overall management of forest concessions. Management plans as well as social responsibility contracts sometimes reflect these socio-economic roles. This report examines the extent to which this is true in Central Africa, taking examples from the forestry policy instruments of Cameroon and the Central African Republic.

REVIEW OF THE IMPACT OF LOGGING ON NWFP AVAILABILITY

According to Roerhorst (2006), of all trees felled worldwide, 48 percent are used as raw materials in the forest products industry. This means that the companies involved have a significant influence on forest landscapes and their management. Timber harvesting affects the vegetation structure and the floristic composition of the forest by triggering many disturbance regimes. The effects of canopy gaps and skid-trails on the residual forest have been well documented. However, the effect on NWFPs in terms of potential changes after logging has been the subject of little specific study. Very few studies have looked at this issue and the policy implications of their results are yet to be fully taken into consideration in the overall management of logged-over forests (Laird, 1995, 1999; Shanley, Luz and Cymerys, 2002; Menton, 2003).

Within the context of the Central Africa subregion, Ndoye and Tieguhong (2004) highlighted the growing importance of timber production in terms of both the annual total area logged and the intensity of harvest. They documented that although logging in this subregion is generally selective the removal of individual trees and the consequent alteration of forest structure and access affect the availability of NWFPs and the livelihoods of those dependent on them. Such impacts on the availability and use of NWFPs by local people are either positive or negative. For example, they observed that in the humid forest zone of Cameroon 61 percent of the top 23 species of timber exploited by logging companies were of great value to local communities and poor urban households for subsistence, income and health. Cardoso (2001) documented that logging in East Province in Cameroon has decimated the moabi tree (*Baillonella toxisperma*) to such an extent that the local economic, social and cultural values of the tree to both the Bantu and pygmy populations were becoming a matter of history. Another priority tree species to most timber companies in the subregion is sapelli (*Entandrophragma cylindricum*). Lewis (2001) observed

the sapelli tree as a storehouse for the most sought-after caterpillar (*Imbrasia oyemensis*). This caterpillar is a delicacy that meets more than 75 percent of the protein needs of forest people during the production season. From these foregoing examples, it seems apparent that one of the greatest threats of commercial logging is probably related to those NWFP species that are exploited for their timber.

CAMEROON FORESTRY POLICY ON NWFPs

The Cameroon forest, with a surface area of 22.5 million ha, is part of the vast biodiversity-rich forest of the Congo Basin. The forestry and wildlife sector of Cameroon stands out as one of the mainstays of national economic development. To date, it represents 11 percent of its gross domestic product (GDP) and 20 percent of its foreign currency revenues, second only to the oil sector. The flora and fauna of Cameroon also play a significant role in the livelihoods of both rural and urban populations (MINFOF, 2005).

The management of forest resources in Cameroon is the responsibility of the Ministry of Forests and Wildlife (MINFOF), which recognizes the promotion of NWFPs as a means for fighting poverty in rural areas and for generating revenue for the national economy. This was institutionalized with the creation of the Directorate for the Promotion and Transformation of Forest Resources in the now defunct Ministry of Environment and Forestry (MINEF), under Decree No. 98/067 of 28 April 1997. Two subdepartments were created, one for the promotion and transformation of NWFPs, and the other for wood products. The policy and regulations affecting the exploitation of NWFPs in Cameroon are influenced primarily by the 1994 National Forestry Law, which specifies forestry, wildlife and fisheries regulations (MINEF, 1994), and by its Decree of Implementation (MINEF, 1995).

Ministerial Decree No. 1354 of November 1999 (relating to the creation and management of state forests) defines the composition and mandate of village forest committees in the management of state forests (MINEF, 2002). The rights for subsistence use of forest resources give local communities bordering state forests the right to harvest forest products, fish and wildlife for subsistence, except protected species. However, any commercial exploitation of forest resources by local communities requires a permit or licence from the ministry in charge of forest resources. The financial laws also have some regulatory roles on the exploitation and trade in NWFPs in Cameroon, especially with regard to the taxes and fees paid. Article 11 of the 1999 Finance Law fixed a regeneration fee of CFAF10/kg (US\$0.02/kg) of any NWFP harvested and sold. The national objectives of forestry policy in Cameroon include:

- the rational and sustainable management of forest resources;
- an efficient processing industry, producing high-value-added products;
- the creation of revenue and its equitable distribution.

This paper is concerned more with the first and third objectives, although with greater emphasis on the third because it concerns local communities managing and benefiting from forest resources.

The 1994 National Forestry Law requires that the following documents or information be provided by any person or company interested in the commercial exploitation of NWFPs:

- Stamped application to the ministry in charge of forests specifying:
 - full name, nationality, occupation and place of residence (for individuals);
 - name, articles of association, head office, registered capital and its distribution, and name of the director or manager (for companies).
- The capital invested (attestation).
- The applicant's investment plan and the financing guarantee (means of transportation envisaged, existing storage facilities and other facilities to be set up, measures taken

to process part of the product locally).

- List of species and quantities to be exploited, as well as the location.
- A signed undertaking that the applicant understands and will abide by the regulations and will cooperate with the Forestry Service.

A ministerial committee sits at least twice a year to grant exploitation permits for NWFP. The permits are valid for one year, but are renewable pending presentation of:

- a stamped application;
- a copy of the previous permit;
- receipts testifying the payment of the registration fee and the selling price of the product;
- copies of certificates of origin, if the holder exports the product;
- a detailed report of the activities of the previous seasons, specifying the quantities of the products exported or processed locally.

Based on the above steps, and in accordance with the recommendations of the technical commission of the ministry, a special permit can be issued. Holders of special permits are responsible for obtaining forestry service specifications, which detail the conditions for exploiting and transporting natural products and the terms and conditions for paying taxes. Following the presentation of a copy of the permit and the receipt or payment of taxes, the provincial chief of forestry can authorize a start to exploitation.

CAMEROONIAN FOREST CONCESSION POLICY

The 1994 National Forestry Law classifies the national forest estate into two categories of forests: permanent forest and non-permanent forest. The permanent forest includes gazetted state forests, communal forests and national parks, while non-permanent forest includes community and private forests. Decree 95/531 differentiates forestry exploitation into four types, the two most important being forest concessions made up of one or several FMUs and the sales of standing volumes (SSVs). A forest concession is attributed for a period of 15 years renewable and for a maximum of 200 000 ha. Sales of standing volumes cannot be more than 2 500 ha and the period of exploitation is one year, renewable twice (Egbe, 2005).

STATE-OF-THE-ART FOREST CONCESSIONS IN CAMEROON

In the 1980s, Cameroon launched the process of sustainable forest and wildlife management. Thus, with the aid of its partners (especially Canada), a vast programme of inventory of the resources was put in place. The results obtained from this inventory, as well as several consultations with different stakeholders, permitted the creation of an indicative framework for land use in the southern forestry zone (zoning plan) covering an area of 14 million ha. Decree 95-678 of 18 December 1995 spells out the legal dispositions of this framework and confirms that of Article 20 of the 1994 National Forestry Law on forest regimes, wildlife and fisheries, consisting of the subdivision of the sector into a permanent forestry domain and a non-permanent forestry domain.

In ten years, Cameroon has moved from a system of allocating licences by mutual understanding (without obligation for the elaboration of management plans) to a concession allocation system that follows a public purchasing procedure (open bidding or auction) with supposed greater transparency. The latter system was assumed to be less susceptible to political pressures and more economically efficient than the previous discretionary practices, giving incentives for improved management and reduction in waste. With this, there was the obligation for the winner of a concession to draw up a management plan (Vandenhoute and Heuse, 2006). This came about in response to the growing domestic and international support for sustainable forest management and for reducing the negative impacts of intensive logging. This process has permitted the breaking up of the permanent forestry domain into 105 FMUs grouped into 97 concessions.

According to official figures, the area attributed at present stands at 5 634 512 ha, representing 78 concessions (for 86 FMUs) (MINEF, 2004). In November 2005, a new call for tenders was made public for the allocation of eight new concessions (for 10 FMUs), representing about 400 000 ha. As a result of this new allocation, only nine FMUs, a total area of about 900 000 ha, will be set aside as conservation zones for corridors between transboundary protected areas in the southeast region.

POLICY TOOLS GOVERNING CONCESSIONS

Provisional convention

Under the provisions of the 1994 National Forestry Law, the concessionaire is expected to sign a provisional convention of exploitation with the forestry administration, pending the signing of the final convention. This provisional convention is valid for a maximum period of three years, during which the owner of the concession is expected to have carried out certain activities, especially the putting in place of an industrial unit for transforming wood and the drawing up of a management plan. The signing of the draft convention requires prior payment of a deposit that is equivalent to the annual forest income for the concession. The signing of the draft convention represents an opening into accessing the resource. To date, the 86 FMUs given out have been done so on the basis of a provisional convention. Of these, 85 FMUs remain “active” while one FMU is in a situation of uncertainty (Vandehaute and Heuse, 2006).

Management plan

Management plans are drawn up during the three years of the provisional convention by a technical evaluation committee of the ministry in charge of forests. They are then analysed and approved based on the following criteria:

- respect of the clauses of the provisional convention and its contract conditions;
- conformity of management plans with legal requirements;
- relevance and originality of management proposals.

The first evaluation committee sat in 2001 with two working sessions per year. The approval of management plans is sanctioned by an ordinance signed by the minister in charge of forests. In all, 42 management plans have been validated on 52 FMUs, which are currently governed “under management”, that is an area of 3 561 692 ha. Three management plans have been rejected.

Final convention

In theory, the final exploitation convention is signed at the end of a provisional exploitation convention for a period of three years (generally longer). This convention is based on the conditions that:

- the management plan has been approved;
- a five-year management plan and the first annual operational plan have been established;
- the specific conditions of the contract have been signed (and may particularly include an industrial project, which is always expected).

This final convention is for a period of 15 years renewable. To date, no final conventions have been signed for FMUs, one of the reasons for this being the failure by companies to comply fully with the guidelines set out in the forestry legislation.

Logging control tools

In order to ensure that the above-mentioned tools are applied, the Government of Cameroon has put in place a strategy for forest and wildlife control. Its objectives are to: increase state and local community revenues; create jobs; prevent economic distortions; ensure sustainable production; and conserve biodiversity and ecosystems (MINFOF, 2005). With regard to forest controls, four types of controls are carried out including planned, routine and special controls and

continuous monitoring of the forest heritage. Both the central and external services (provincial, divisional, forestry stations and technical operational units) of the forestry service are involved in exercising these controls. The control and monitoring of forest activities are carried out:

- at logging sites, timber yards, and frontier stations;
- along railway, maritime, and land routes for the transport of forest products;
- at entrances of processing units, and at seaports and airports.

Of particular interest to this paper is the control at logging sites. This generally focuses on:

- the validity of logging titles;
- the identity of the concession holder or subcontractor;
- respect of boundaries;
- execution of clauses of specifications;
- respect of forest inventory standards;
- respect of management regulations, technical logging standards (marking of logs and stumps, minimum exploitable diameter, and keeping logging site records) and tax obligations (regular payment of taxes and forest royalties).

Therefore, for forest under management, control officers must ensure that the minimum exploitable diameters and annual felling potentials are respected. The logging company is bound to respect all the obligations contained in the specification document or social responsibility contract. Overall, an effective control at a logging site requires *inter alia*: a five-year management plan, an annual felling licence, a map of the concession, and specifications of intervention standards in the forest (MINFOF, 2005).

FORESTRY POLICY OF THE CENTRAL AFRICAN REPUBLIC

The Central African Republic is a landlocked country located between latitude 2°3'–11°2' N and longitude 13°25'–27°27' E and covering a total area of 623 000 km² (Bonannee, 1999). It has 5.4 million ha of humid dense forests divided into two distinct blocks:

- The Southwest Block, extending over an area of 3 800 000 ha. This comprises 300 tree species with an exploitable volume of 241 million m³. Sixty-six species have a commercial volume of 93 million m³.
- The Southeast Block of Bangassou has an area of 1 600 000 ha but it is not exploited on a commercial scale because of its great distance from export centres (Demarquez and Petrucci, 2005).

Major characteristics of the Central African Republic forest and management are:

- species richness;
- long distance from port of exports;
- sizeable concessions (250 000–400 000 ha);
- unlimited duration for exploitation and management permits;
- obligation of the logging companies to invest in wood transformation units.

The selective nature of markets and the high costs of transportation provide compelling reasons for cutting only a few highly sought-after species. However, the forestry sector ranks first in terms of its contribution to the national economy in terms of exports and fiscal income, and it provides employment to more than 4 000 permanent workers. In 2004, state revenue from the sector amounted to CFAF 11 400 million, constituting 18 percent of gross national product (GNP) (Demarquez and Petrucci, 2005).

The Ministry of Water, Forest, Hunting and Fishing (MEFCP) is charged with the implementation of the National Forestry Code. It has 350 agents and is governed by an organizational scheme adopted in January 2004. Activities in the field are coordinated by regional directorates and forest inspectors at the level of 16 divisions, and by forest cantonments in subdivisions. The

Directorate of Exploitation and Forest Industries is responsible for the publishing of revenues and recovered forest taxes intended for the treasury (rents, felling tax and reforestation tax). More than ten years ago, the Central African Republic engaged resolutely in a new forestry policy in which the interests of the local communities were taken into consideration and in which forest exploiters were involved fully in management efforts. The country set up the following medium- and long-term objectives:

- To preserve the natural balance of the forest environment and ensure the sustainability of the forest through a better management.
- To ensure the making of a profit from and the rational use of forest and fauna potentials.
- To promote the use of little-known and/or little-used secondary products.
- To elaborate principles, criteria and indicators (PCIs) of sustainable forest management on the basis of those of the African Timber Organization (ATO).

Three priorities are given greater attention: (i) increased knowledge of forest resources; (ii) the establishment of a forest management plan; and (iii) improved valuation of resources. Law No. 90/003 includes the 1990 Forestry Code and has as its major goal the harmonization of the imperatives of profitability of the forest heritage and of conservation in order to ensure forest sustainability. Decree No. 91/018 of 1991 fixes the modalities for granting exploitation and management permits. The granting of all permits is subject to consultation with the local communities and must be accompanied by specifications on technical exploitation conditions. Moreover, there are also provisions concerning the protection of the area during and after exploitation. Simple and pragmatic, the legal framework is able to respond to the essential needs of the sector, even though it needs improvement.

PROCEDURE FOR AWARDING EXPLOITATION AND MANAGEMENT PERMITS

In accordance with the Forestry Code and Decree No. 91.018 of 1991, exploitation and management permits (PEAs) are awarded to timber companies after consideration of the adequacy of their financial capital, type of logging equipment and permanent technical staff. The MEFCP requires the divisional officer of forestry to submit documents related to the financial situation of the company (i.e. the payment of area-based tax, a legal authorization memo, a full description of the forest area, as well as a detailed map of scale 1:200 000 showing the area to be exploited). The divisional officer sends the documents to the Inspectorate of Forest and Water, which examines them and notifies the municipal councils to inform the local people by written notice, poster or radio about the logging company's intention to exploit their forest. The Inspectorate of Forests and Water does this by putting together a technical team to assess the timber exploitation request, to obtain the opinions of the local population and to write a report. In a situation where the population opposes the exploitation of timber in their area, the municipal counsellor is sent to find out why and to arrive at a consensus with them. Where no compromise is reached and opposition persists, the municipal counsellor reports to the divisional officer, who writes to the MEFCP for arbitration.

As a follow-up, after three months of consultation and acceptance by the local population, companies make requests to the MEFCP by submitting a complete set of documents in accordance with the procedure for attributing PEAs. A technical interministerial commission involving representatives of the local people (e.g. mayors and some nobles), selected persons from the technical department of the MEFCP and other concerned ministries in charge of commerce, taxes, and customs is formed to examine the eligibility of companies from their documents submitted. Documents retained as eligible by the commission are submitted to the advisors of the minister for the final decision in accordance with the Forestry Code (Demarquez and Petrucci, 2005).

FORESTRY CODE OF THE CENTRAL AFRICAN REPUBLIC AND NWFPs

Within the context of access to NWFPs in the Dzanga-Sangha forest, local populations have user rights under Decree No. 90.017 of 1990 (Guedje, 1999). Section II of the Forestry Code specifies the subsistence user rights of local people for NWFPs from natural forests while Section III specifies user rights with respect to commercial NWFPs harvested from natural forests (MEFCP, 2001). However, the “cahier des charges” of SBB for the 307 600-ha production forest fail to mention any clause on user rights of local people with respect to NWFPs. Rather, Article 20 places emphasis on social infrastructure for the local people and the need to employ labour from the Central African Republic (SBB, 1999).

CHAPTER 4

MAIN RESULTS OF THE CASE STUDIES

ZEGA CASE STUDY

This concession (FMU 10-063) is now under the exploitation and management of ALPICAM Kika, which was installed in Kika on 10 March 2005. ALPICAM Kika can exploit timber from FMU 10-063, which it inherited from SIBAF, for a period of 25 years. Before handing over the FMU to ALPICAM Kika, SIBAF had exploited five “assiettes des coupes” (annual exploitation units) over a period of five years. This was in accordance with an interministerial decision (MINFOF and MINEFI) of 4 March 2005. This Italian company has been in Cameroon since 1973, featuring mainly in timber exploitation and primary processing (plymilling, sawmilling, etc). In partnership with Grumcam (a German company), the company has other installations at other sites in Cameroon, notably at Mindourou and Douala.

Before logging activities commenced, inventories were carried out that indicated the richness of the concession in terms of priority species demanded by the company’s clients in Europe. A management plan drawn up by SIBAF was adopted by ALPICAM Kika. For the first eight months of logging in 2005, nine species were exploited for a total volume of 23 703 m³ (Table 1).

TABLE 1
TIMBER PRODUCTION BY ALPICAM KIKA, 2005 (8 MONTHS)

Scientific name	Trade name	No. of stems cut	Volume (m ³)	% production
<i>Triplochiton scleroxylon</i>	Ayous*	1 163	18 446	77.8
<i>Entandrophragma cylindricum</i>	Sappelli*	265	3 590	15.1
<i>Pericopsis elata</i>	Assamela	66	819	3.4
<i>Khaya</i> spp.	Acajou*	24	301	1.3
<i>Entandrophragma condollei</i>	Kossipo*	16	228	0.1
<i>Aningeria altissima/robusta</i>	Aningre	14	133	0.06
<i>Guerea cedrata/thompsonii</i>	Bosse*	10	95	0.04
<i>Entandrophragma utile</i>	Sipo*	3	76	0.03
<i>Melicia excelsa</i>	Iroko*	1	15	0.001
Total		1 562	23 703	

* Timber species with NWFP values to local people.
Source: ALPICAM Kika, 2005.

This volume was based on the first exploitation unit of ALPICAM Kika from March to December 2005. Priority species for the company were ayous and sappelli, which constituted more than 90 percent of total production. Most of the timber species (78 percent) are of NWFP value to the local people of Zega either for medicinal purposes or as sources of food (e.g. caterpillars).

IMPORTANCE OF NWFPs TO THE INHABITANTS OF ZEGA

According to the local people of Zega, their different activities in the forest are well defined in terms of periods and location. Among these, the main ones include hunting, fishing, agriculture and especially the gathering of NWFPs. These activities are important not only for meeting food

needs but also for earning income. This income enables them to obtain other basic necessities (e.g. salt, soap, kerosene and modern medicines), to buy clothes and to send their children to school. Most NWFPs are also used as traditional medicines and in the construction of houses. Important NWFPs harvested and/or collected by the people of Zega from FMU 10-063 can be classified according to origin as either animal-based or plant-based NWFPs (Tables 2–4).

TABLE 2
NWFPs COLLECTED BY ZEGA PEOPLE FOR HOUSEHOLD AND COMMERCIAL PURPOSES

Scientific name	Local name	Uses	Average quantities ¹ harvested before logging	Average quantities ¹ harvested after timber exploitation	Trend	Unit selling price in village (CFAF)	Unit price in Yoka
<i>Afromamum</i> spp.	Tondo	Sale	little	35 basins	Increase*	2 400	6 000
<i>Gnetum</i> spp.	Koko	Consumption/sale	little	500 packets	Increase**	25	50
<i>Irvingia</i> spp.	Payo, Pekie	Consumption/sale	42 basins	65 basins	Increase**	5 000	25 000
<i>Annonidium mannii</i>	Wild corossolier	Consumption/sale	100 fruits	50 fruits	Decrease	25	100
<i>Ricinodendron heudelottii</i>	Njansang	Consumption/sale	1.2 basins	4.5 basins	Increase**	10 800	25 000
	Nadjiébé (Bakwélé) Nayembé (Bangando)	Consumption/sale fruits/bark	5.5 basins 5.5 bags	9 basins 5.5 bags	Increase*	1 800 4 500	3 000 30 000
<i>Citrus</i> spp.	Wild orange	Consumption/sale	5 baskets	3 baskets	Decrease	1 000	4 000
			10 basins	7 basins		2 500	6 000
<i>Calamus deeratus</i>	Rattan	Construction	37.5 packets	52.5 packets	Increase*	1250	3 500
<i>Raphia hookeri</i>	Raphia	Making of thatches, houses, beds, shelves	1 000 thatches	1 500 thatches	Increase**	100	200
			5 beds per year	10 beds per year		500	1 500
<i>Maranthocloa</i> spp.	Marantacées	Mats & baskets, houses for Baka, food wrapping	22 mats	60 mats	Increase**	1 250	2 000
			90 baskets	125 baskets		500	1 500
<i>Pogo oleosa</i>	Forest groundnuts (Kana)	Consumption/sale fruits/bark	2 sacks	1 bag	Decrease	10 000	28 000
<i>Apis mellifera</i>	Honey	Consumption/sale fruits/bark	30 litres	30 litres	Same	750	2 500
<i>Dioscorea</i> spp.	Wild yams	Consumption only	5–10 tubers	0–2 tubers	Decrease	-	-
<i>Xanthosoma sagittifolium</i>	Wild cocoyams	Consumption only	1–2 basins	0–1/2 basin	Decrease	-	-
<i>Achatina</i> spp.	Snails	Consumption/sale fruits/bark	10 buckets (15 litres)	2 buckets	Decrease***	500	10 000
<i>Imbrasia</i> spp.	Caterpillars	Consumption/sale fruits/bark	15 basins	1 basin	Decrease	5000	7 000
<i>Termitomyces</i> spp.	Mushrooms	Consumption/sale fruits/bark	200 cups	100 cups	Decrease***	25	100
<i>Piper guineensis</i>	Bush pepper	Consumption/sale seeds/fruits	30 kombo (1 basin = 7 kombo)	30 kombo	Same	500	2 500

¹ = Average quantity consumed and/or sold.

* Increase associated with changes in microclimate conditions at forest floor that favour faster growth of species listed.

** Increases associated with increase in product commercialization because of hitherto unknown market niches; despite a general decrease in quantity in the forest, more effort is put into obtaining larger quantities than before logging.

*** Decrease associated with increase in population in the area that puts more pressure on the products, and with thicker undergrowth at the forest floor after logging that rendered movement in the forest difficult.

Source: CIFOR surveys, 2006.

TABLE 3
MEDICINAL PLANTS USED BY THE PEOPLE OF ZEGA

Scientific name	Local name	Use
	Mamlélengué	Treatment of fever/malaria.
	Mognokou	Treatment of fever/malaria and stomach-ache (kounandjobo).
<i>Swartzia fistuloides</i>	Kalala	Treatment of sexual weakness in men (CFAF2 000–5 000/treatment).
<i>Manniophytum fulvum</i>	Koussa	Treatment of dysentery.
<i>Pycnanthus angolensis</i>	Ilomba	Bark and leaves for the treatment of malaria.
	Soumbelon	Latex for treatment and washing of kitchen utensils.
<i>Gossweilerodendron balsamiferum</i>	Tola/Sidong	Treatment of malaria and cough (CFAF500–5 000).
	Mendi (Baka)	Magic tree / banish witches / treatment of the sick.
<i>Erythropheum ivorense</i>	Tali	Treatment of abscesses and detection of thieves.
	Kolwa	Treatment of many diseases.
<i>Dalhousia africana</i>	Mbindjo (rare sp.)	Treatment of diarrhoea (kounaboubouo)
	Songolibila	Tree that causes rain to end droughts. Used for toothache.
<i>Bombax buonopozense</i>	Baobab	Tree that causes rain and helps treat sexual impotence.

Source: CIFOR surveys, 2006.

TABLE 4
WILD ANIMALS HUNTED AND USED BY THE PEOPLE OF ZEGA

Scientific name	Common name	Use	Average no. hunted per week before logging	Average no. hunted per month after logging	Unit price in the village (CFAF)
<i>Lepus</i> spp.	Hare	Consumption & sale	6	1	700
<i>Cephalophus</i> spp.	Duiker	Consumption & sale	5	1	1 500
<i>Atherurus africanus</i>	Porcupine	Consumption & sale	15	3	500
<i>Manis tricuspis</i>	Pangolin	Consumption & sale	8	2	500
<i>Tragelaphus euryceros</i>	Bongo	Consumption & sale	3	0–1	10 000
<i>Viverra civetta</i>	Civet	Consumption & sale	20	5	250
<i>Cercopithecus</i> spp.	Monkey	Consumption & sale	10	3	1 000
<i>Python sebae</i>	Boa	Consumption & sale	1	0	1 500
<i>Gorilla gorilla</i>	Gorilla	Consumption & sale	3	0	12 000
<i>Trionyx</i> sp.	Tortoise	Consumption & medicine	5	2	500
<i>Thryonomys swinderianus</i>	Grasscutter	Consumption & sale & medicine	0	6*	1 500
<i>Manis gigantean</i>	Giant pangolin	Consumption & sale & medicine	2	0	1 500
<i>Loxodonta africana</i>	Elephant	Consumption & sale & medicine	1	0	
<i>Potamochoerus porcus</i>	Bush pig	Consumption & sale	3	0	10 000
<i>Giraffa camelopardalis</i>	Girafon	Consumption & sale	2	0	
<i>Varanus niloticus</i>	Water Nile monitor	Consumption & sale & medicine	3	1	
<i>Crocodylus niloticus</i>	Crocodile	Consumption & sale	3	1	
<i>Atheris</i> sp.	Viper	Consumption & sale	3	0	500

* Species with high increase in number after logging.

Source: CIFOR surveys, 2006.

The NWFPs harvested from the forest by the local people included leafy vegetables, lianas, mushrooms, tubers, barks, seeds and fruits. Out of 18 plant-based NWFPs identified, 2 (11 percent) were for subsistent food products, 13 (72 percent) for both subsistence and commercialization and 3 (17 percent) for personal construction materials and other uses (Table 2). Although production of five of the listed NWFPs was on the increase, in reality their availability in the forest was decreasing owing to increasing commercial exploitation. Two of the listed NWFPs showed a declining trend not because of low production in the forest but because physical accessibility was hampered by thick forest undergrowth after logging.

Forest products in the form of barks, roots and leaves are very important for the treatment of common ailments in villages as well as urban centres in the humid forest zone of Central Africa. The people of Zega consider the forest as their primary pharmacy. It provides them with medicines for the treatment of various fevers, dysentery, diarrhoea, toothache, stomach-ache and various sexual dysfunctions. Treatment among the people in the village is always free of charge but people who come from other villages or towns pay varying charges ranging from CFAF500–5 000 for malaria/cough to CFAF2 000–5 000 for sexual weakness (Table 3).

Apart from plant-based NWFPs, the people of Zega also cited many animal-based NWFPs that are important to food security and income generation (Table 4). The animal-based NWFPs listed range from small animals (e.g. pangolins) to large mammals (e.g. elephants). Apart from the tortoise, all other animals caught are sold. Animals may also be consumed and/or used for medicines depending on the number caught and on the present needs of the household for meat, medicines and/or cash income. For example, as indicated in Table 4, all the animals caught can be used to meet subsistence food needs, 14 for both subsistence and commercialization, and 4 for consumption, commercialization and medicines. In view of the importance of these products to household food security, poverty alleviation and health, the following sections examine the possible impacts of timber harvesting on their availability.

IMPACT OF TIMBER HARVESTING ON NWFP AVAILABILITY

The impacts of timber harvesting on the availability of NWFPs were observed as positive, negative or neutral. Neutral impacts were rarely reported because local people had varying perceptions as to what the real impact of logging on certain NWFPs could be. Impacts of timber harvesting were perceived differently depending on whether the NWFP was of animal or plant origin.

Impact of timber harvesting on plant-based NWFPs

With regard to positive impacts, the local people believed that roads/trails created by the passage of logging vehicles led to a general increase in the availability of some NWFPs such as tondo, njansang (*Ricinodendron heudelotii*) and some species of yams. The increase could be associated with microclimate changes caused by canopy opening that allowed higher light intensity to reach the understorey plants. The njansang tree grows well in fallow lands and secondary forests because it is a pioneer (shade-intolerant) species.

Apart from the species that enjoy logging-induced microclimate changes at the forest floor, more than 70 percent (Table 2) of the NWFPs suffered a decrease in their availability following logging. The greatest impacts were reported for NWFPs found on tree species that are also extracted by the timber companies, e.g. sapelli, ayous, frake, kossipo, sipo and iroko. When these species are exploited by timber companies, most of the non-wood values disappear. Examples include the exploitation of ayous and sapelli for timber (Table 5). These species produce caterpillars that are much sought after by local people for consumption and sale. Timber exploitation by ALPICAM Kika has also led to the destruction of other trees that furnish NWFPs, such as bush mango and njansang. These are highly priced and widely consumed products by the local people. Damage is associated with the passage of heavy machines that destroy NWFPs such as wild yams (tubers), leafy vegetables such as koko (*Gnetum* spp.) and many lianas, important for food, income and health.

TABLE 5
TOP TIMBER SPECIES WITH OR WITHOUT NWFP VALUES IN ZEGA

Timber trees	Trade name	Local names (Baka)	NWFPs		Specific product/use
			No	Yes	
<i>Entandrophragma cylindricum</i>	Sappelli	Esié (Bakwélé) Mboyo(Bangando)		•	Caterpillars, medicines
<i>Triplochiton scleroxylon</i>	Ayous	Eguess-Bakwélé Sepa (Bangando)		•	Caterpillars, consumption + sale
<i>Melicia excelsa</i>	Iroko	Bangui		•	Making mortars, medicine, aphrodisiac
<i>Terminalia superba</i>	Frakè	Mobanga	•		Making canoes
<i>Entandrophragma condollei</i>	Kossipo	Mokanga		•	Caterpillars, medicines
<i>Entandrophragma utile</i>	Sipo	Goy		•	Caterpillars, medicines
<i>Khaya</i> spp.	Acajou	Deke		•	Medicines

Source: CIFOR surveys, 2006.

The local people have witnessed a general decrease in the availability of caterpillars, raphia, honey, some species of wild yams and mushrooms, which they believe do well in virgin forests. Some species such as *Gnetum* spp. (koko) have witnessed an increase in the quantities commercialized by an increasing population but with an overall decrease in their availability in the forest. However, some species such as njansang and tondo have witnessed increases in availability after logging while that of some species of mushrooms and wild cocoyam has remained relatively unchanged (Table 6).

TABLE 6
IMPACT OF TIMBER HARVESTING ON THE AVAILABILITY OF NWFPs

NWFP		Observations
Species on the increase	Njansang & tondo	These species grow more in terms of densities and growth rates after timber exploitation. However, most njansang trees are destroyed during the process of timber exploitation.
Species on the decrease	Sappelli & ayous	These are priority species for the logging company ALPICAM Kika.
	Bush mango, kana (<i>Pogo oleosa</i>) wild yam, caterpillars (kopo), snails, raphia & honey.	These species have witnessed a decrease in availability and demand is increasing following population increase in the village. Access to them is a problem owing to increased undergrowth in the forest.
Species that have remained relatively the same	Some species of wild cocoyam & some species of mushrooms.	After logging, all these species are disturbed and might decrease in some areas, but overall they still have enough quantities in the forest in most places.

Source: CIFOR surveys, 2006.

The local people of Zega believe that timber harvesting alters and disrupts the biological cycles of some species as well as destroying their habitats. Other reasons put forward for the decrease in some NWFP were linked indirectly to the presence of the logging company ALPICAM Kika. For example, the reduction in the quantity of *Gnetum* and raphia in the forest was associated with the influx of people from other areas of the country in search of employment in the logging company. According to the villagers, this has increased the population of the area dramatically, with consequent increases in demand and pressure on forest resources. In the case of the increased demand for raphia, more houses have to be built and, in the absence of expensive aluminium sheets for roofing, the immigrants turn to local raw materials. These are already limited in supply and people now have to walk several kilometres to harvest them. However, the arrival of the company has also brought about the discovery of previously unknown commercial products such as tondo (which grows more after logging). According to the people of Zega, in the past tondo served as food for wild animals but today the market value is well recognized.

Impact of timber harvesting on animal-based NWFPs

With logging activities, bushmeat, which forms the main source of protein for the local people, has become very rare (Table 7). This is explained by the fact that logging has opened up roads in the forest. This has made it easier for many people in search of employment at the company to invade the forest for bushmeat in order to earn an income and survive while waiting for work at the company.

TABLE 7
IMPACT OF LOGGING ON THE AVAILABILITY OF BUSHMEAT

	Species of animal	Observations
Species on increase	Grasscutter & porcupine	The local people are experiencing an increasing number of grasscutters destroying their food crop plantations. Increase associated with more undergrowth of palatable herbs after logging.
Species on decrease	Duiker, hare, wild boar, monkey, civet & antelope	All the species hunted by local people are decreasing. Failure to employ job seekers by the company keeps them waiting, during which time they hunt. The low wages of some company workers forces them to look for supplementary income by engaging in hunting. Increase in the number of poachers associated with the installation of company. Safari is also a deterrent to free movement of local people in the forest.
Species that remained stable	None	No species has remained stable because of invasion of the zone by poachers practising unregulated hunting.

Source: CIFOR surveys, 2006.

Out of 18 animal species identified in Zega village, the availability of 16 of these has decreased, while grasscutters and porcupines have become more abundant. This increase may be associated with the increased undergrowth of palatable grasses on the forest floor following logging. The population of no animal hunted by the population has remained stable after logging because of invasion of the forest by poachers. Despite the general decrease in bushmeat species after logging, the new plants that have grown as undergrowth after logging have brought new species of animals formerly unknown to the people of Zega. A case in point is the grasscutter (*Thryonomys swinderianus*), which invades and destroys agriculture crops. Local people have yet to understand how to trap or hunt them.

Focus groups listed both the advantages and disadvantages of logging in their locality. According to the people of Zega, the presence of the logging company has led to a disruption in their socio-economic survival strategies. Notable disadvantages include:

- disappearance of many medicinal plant and animal species;
- destruction of the forest;
- facilitation of poachers' activities;
- increase in prices of common commodities;
- increase in theft;
- increase in the level of prostitution;
- incidence of HIV/AIDS and sexually transmitted diseases;
- prohibition of farming by cutting down trees;
- disappearance of springs and streams (associated with traction by logging vehicles).

The overall perceptions of the people of Zega with regard to the presence of the logging company was not entirely negative as they cited some advantages associated with the activities of the company in their area:

- employment possibilities for young people;
- increased possibility to sell agricultural, livestock and forest products;
- living nearer to public authorities and services;

- good state of roads;
- increase in knowledge and discovery of new product values and eating habits;
- existence of the annual forestry and wildlife fees, with a proportion earmarked for community development.

Considering that merely listing disadvantages and advantages does not lead to a clear understanding of what is needed in order to solve existing or potential conflicts of interest over natural resources, the people of Zega were asked to state the major problems and their possible solutions that would enable them and the company to coexist in the forest (Table 8).

TABLE 8
PROBLEMS ENCOUNTERED AND POSSIBLE SOLUTIONS ENVISAGED

Problems encountered	Solutions envisaged
Not taking into consideration the rights of the local people by the company.	Elaboration of a "cahier des charges". Regular consultation between local people and the senior officials of the company.
Invasion of the forest by three groups (sport hunters, poachers & loggers)	Set a base for logging, whereby a forest zone is left for the local population's activities.
Lack of support to Baka and Bantu women for basic needs (healthcare, transport & employment). No consideration of children	Recruitment of women by ALPICAM Kika. Facilitation of access to social services for Baka women (health, school & transport). Take into village children consideration.
Failure to take into consideration the existence of Baka in the forest.	Divide the forest and leave an area exclusively for Baka people.
Repression and restriction of Baka by logging company and safari.	Free movement of Baka in the forest for their activities (hunting, fishing, picking and gathering NWFPs, & agriculture)
Prohibition of felling trees for farming.	Freedom to move in the forest.
Refusal to give sawmill residues to the local populations for their domestic uses.	Ensure access to sawmill residues for local construction needs (houses, sheds, etc.)

Source: CIFOR surveys, 2006.

PERCEPTIONS OF ALPICAM KIKA RESOURCE PERSONS

Local people provide local labour as well as local food items. However, with regard to the local population, the resource person of the company mentioned two main possible problems:

- The rapid increase in agricultural activities by local people in the forest concession (at a rate of at least 0.2 ha/year). Suggested possible solutions were the circumscription and exclusion of the living space of the local population as well as the delimitation of an area of 155 ha for the two villages (Zega and Ndjombi) that are very close to the FMU. Another possibility suggested was the need to stabilize agricultural production of the same piece of land through improved agricultural techniques. This could take the form of providing agricultural inputs and developing alternative non-forest-based activities for the local people.
- Ignorance of the law by the local people, with implications for the rights and activities of the company and resulting in claims and grievances. Here, the need to enlighten local people about the law governing the creation of the permanent forest domain was highlighted.

When asked whether there had been any agreement with local populations on exploitation of the forest, the resource person of ALPICAM Kika asserted that there had never been any direct contact and negotiation between the local people and the logging company, the latter still in the process of installing its factory. However, the company recognizes that such a negotiation is imperative for the execution of its activities without local conflicts. With regard to the respect of "cahier des charges", the resource person attested that only about 30 percent had been realized.

OPINION OF THE MINFOF RESOURCE PERSON

The forestry authority of MINFOF in Kika was of the opinion that local people harvest a good number of NWFPs from the forest, famous among which are: koko (*Gnetum* spp.), péké (*Irvingia* spp.), caterpillars and raphia (*Raphia hookeri*). Raphia leaves form a major construction material for local communities, but pressure on the resource is increasing with the rapidly increasing village population. This is already resulting in some level of scarcity.

With regard to possible disagreement between local people and the logging company, the chief of post Kika did not think there had been any incidence where the former had complained of any decline in NWFPs associated with the activities of the latter. Rather, local people complain of not having enough employment opportunities within the company and of not having access to treatment in the company's clinic as well as not receiving other social benefits that the company is supposed to provide.

Concerning local employment generation by the company, the chief of post attested that the company is installing a new sawmill that utilizes modern technology with little manual intervention required. The implication is that there will be less employment for local people. However, he asserted that the company is supposed to have a "cahier des charges" that defines exactly their social responsibilities in relation to local populations. Within the framework of the fight against poaching, the local MINFOF officer has never received any form of assistance from the company in the process of exercising his functions.

SUGGESTIONS AND RECOMMENDATIONS MADE BY STAKEHOLDERS

Populations

There is need for the company to create a platform where local people's voices can be heard. The local population, the administration and the logging company have to sit down together and draw up the "cahier des charges". Through a consultation process, there is a need to create an agroforestry zone that will enable the local people to operate in their own domain while the logging company operates on its own area, thereby reducing the possibilities of conflicts. The timber species with local NWFP values to the local population need to be subjected to systematic inventories, the results of which may enhance the possibility of allocating a certain number to the logging company, with the remainder for local use.

ALPICAM Kika

According to the ALPICAM Kika resource person, there is a need for a more specific and detailed study in order to understand clearly the problems and possible solutions in relation to Cameroonian forestry law. There is also a need to develop alternative activities that are of interest to the local people. Local NGOs have to be included in the overall strategy of education and information dissemination on the rights of the local people, logging company and the rights of other stakeholders in the forest. Therefore, ALPICAM Kika needs the services of other partners, especially local NGOs, that are closer to the local populations in order to assist in: (i) disseminating information on what the law says; (ii) educating and training local people; and (iii) helping to prevent or manage conflicts.

NGUENGUELI CASE STUDY

The logging company Bayanga Wood Company (SBB) started its operations around Nguenguéli village in 2004 and stopped after just six months. SBB operated in the northern section of the Bayangan dense forest (3 150 km²). The history of exploitation titles in the Dzanga-Sangha forest

block shows that different companies have exploited it since 1970:

- Between 1970 and 1985, a company known as Slovenia-Bois was given a temporary exploitation permit (PTE) to exploit 400 000 ha within the central zone of the Dzanga-Sangha forest.
- Between 1987 and 1988, Groupe A Bonneau took over from Slovenia-Bois to exploit the same area under a PTE.
- Between 1989 and 1990, SA Sangha-Bois took over from Groupe A Bonneau under a PTE.
- From October 1992 to December 1997, Sylvicole-Bois obtained the first exploitation and management permit (PEA) to exploit timber from an area of 307 600 ha.
- Sylvicole-Bois handed over to SBB. SBB started the exploitation of the 307 600 ha of Bayangan forest in 1999 but suddenly ceased operations in November 2005 for reasons best known to the company.

Table 9 shows the timber production volume in 2003 for SBB and all the other logging companies in Central African Republic.

TABLE 9
TIMBER PRODUCTION IN THE CENTRAL AFRICAN REPUBLIC, 2003.

Scientific name	Trade name	SBB		All companies	
		Volume (m ³)	Production (%)	Volume (m ³)	Production (%)
<i>Entandrophragma cylindricum</i>	Sapelli*	11 637	44.33	196 882	38
<i>Triplochiton scleroxylon</i>	Ayous*	10 245	39.02	156 854	30
<i>Melicia excelsa</i>	Iroko*	741	2.82	55 010	11
<i>Aningeria altissima</i>	Aniegre	–	0.0	47 906	9
Others	Others	1 754	6.68	33 675	7
<i>Entandrophragma utile</i>	Sipo*	1 651	6.29	13 336	3
<i>Entandrophragma condollei</i>	Kossipo*	–	0.0	5 296	1
<i>Guerea cedrata/thompsonii</i>	Bosse*	225	0.86	4 589	1
<i>Mansonia altissima</i>	Bete	–	0.0	2 617	1
Total		26 253	100.0	516 166	100
Surface area exploited (ha)		307 600		2 726 882	

* Timber species with NWFP values.

As indicated in Table 9, sapelli, ayous and iroko constituted 79 percent of the total volume exploited by all logging companies in the country (86.17 percent for SBB). In the country at large, a total volume of 516 166 m³ of wood was exploited in 2003, with 83 percent from tree species with NWFP values. By the same calculation, SBB exploited a total volume of 26 253 m³ of timber in 2003 with more than 93 percent from tree species of NWFP value to local people.

In addition to tree species that furnish NWFPs to the people of Nguengueli, many other plant-based and animal-based NWFPs are harvested or collected by local people from the forests of the Central African Republic. For example, Table 10 lists the NWFPs harvested by the people of Nguengueli village from the forest concession exploited and managed by SBB.

The NWFPs harvested from the forest by the local people of Nguengueli included leafy vegetables, tubers, barks, seeds and fruits. Out of 31 plant-based NWFPs identified, 7 were for subsistence food products (22 percent), 21 for both subsistence and commercialization (68 percent) and 3 for personal construction materials and other uses (10 percent). The general trend in the availability of plant-based NWFPs in Nguengueli after logging showed that of the 31 species of NWFPs, 14 (45 percent), 15 (48 percent) and 2 (7 percent) were said to have remained the same, decreased and increased, respectively.

TABLE 10
NWFPS AND THEIR USES BY THE PEOPLE OF NGUENGUELI

Scientific name	Name of NWFP	Uses	Quantity harvested *		Local price	Price outside Bayanga	Change after logging
			Before logging	Now			
(CFAF)							
<i>Dioscorea</i> sp.	Ekoule (wild yam)	C&S**	More	Less	100–200	300	Decrease
<i>Imbrasia</i> spp.	Caterpillars (monkongo)	C&S	More	Less	8 000 per basin (15 kg)	17 000 per basin	Decrease
<i>Gnetum</i> spp.	Koko	C&S	Less	More	50 per bundle	100 per bundle	Increase
<i>Tricholoma</i> spp.	Mushroom (gougou)	C&S	+ more	Less	50/cup	–	Decrease
<i>Afrostyrax lepidophyllum</i>	Yembé	C&S	++	++	25 per 3 grains	100 at Nola	Same
<i>Gambeya</i> spp.	Libambou	C&S	++	++	50 per fruit		Same
<i>Piper guinensis</i>	Poivre noire	C&S	++	+++	2 500 per basin		Increase
<i>Annonidium manii</i>	Mobili (corossol)	C&S	++	++	25 per fruit		Same
<i>Landolphia</i> spp.	Done	C&S	++	++			Same
<i>Diospyros</i> spp.	Ebène (fruit)	C&S	+	+			Same
<i>Iringia wombulu</i>	Payo mobolou	C&S	++	++	50 per ½ kg		Same
	Mosselle	C&S	More	Less	50 per bundle	250	Decrease
<i>Cola</i> sp.	Popoko	C&S	More	Less		1 000	Decrease
<i>Funtumia elastica</i>	Ndembo	C&S	More	Less	50	150	Decrease
	Essemba	C&S	More	Less	1 500	2 500	Decrease
<i>Landolphia</i> spp.	Pembe	C&S	More	Less	1 500	7 000	Decrease
<i>Alchornea mabondji</i>	Mabondji	Consumption	More	Less	Not for sale		Decrease
<i>Pogo oleosa</i>	Bokana	Consumption	More	Less	Not for sale		Decrease
<i>Manniophytum fulvum</i>	Koussa	Consumption	More	Less	Not for sale		Decrease
<i>Ereospatha wendlandiana</i>	Mpombo	Consumption	More	Less	Not for sale		Decrease
<i>Afrostyrax lepidophyllum</i>	Yembe	Condiment for soup	2+ basins per day	2 basins per day	50 per glass	10 000 per basin	Same
<i>Pogo oleosa</i>	Bokana/kana – forest groundnut	C&S	More	Less	50 per glass (30 cl)		Decrease
<i>Raphia</i> spp.	Mbougou or bamboo	construction material	Common in the forest	No change	100 per bundle		Same
<i>Megapyrnum & Maranthochloa</i> spp.	Ngougou / leaves mbili	Wrapping Roof of Ba'aka	Sufficient	No change	Used according to need		Same
<i>Raphia</i> spp.	Mossende or raphia	Palm wine	10–20 litres per day	10–20 litres per day	150 per litre	200/litre	Same
<i>Calamus & Ancistrophyllum</i> spp.	Kpombo (rattan)	Furniture (beds, chairs, cupboards)	Common in the forest	Common in the forest	50–100 per wrap		Same
<i>Tetrapleura tetraptera</i>	Ekombolo	C&S	Sufficient	Little decrease	50 per glass		Decrease
<i>Desplatsia</i> spp.	Liamba or wild okra	Consumption	Common in the forest	Common in the forest	Not for sale		Same
<i>Funtumia elastica</i>	Dembo (fruit)	Consumption	Common in the forest	Common in the forest	Not for sale		Same
<i>Annonidium manii</i>	Mobaï wild corossol	Consumption as fruit	Common in the forest	Common in the forest	Not for sale		Same
<i>Afromamum</i> spp.	Ntondoh (fruit)	C&S	1–2 basins	1–2 basins	50 per cup – barter		Same

* Change in availability: + = not much in availability, ++ = much, +++ = a lot.

** Consumption & sale

Source: CIFOR surveys, 2006.

IMPACT OF LOGGING ON THE AVAILABILITY OF NWFPs

According to the people of Nguenguéli, logging in this forest has had different impacts on different types of NWFPs. While some have witnessed a decrease in quantities harvested after logging, the availability of others has increased or remained unchanged. This pattern holds true for plant-based NWFPs (Table 11), while for animal-based NWFPs, logging activities have led to a reduction in the number of animals hunted in the forest (Table 12).

TABLE 11
TOP TIMBER SPECIES WITH OR WITHOUT NWFP VALUES IN NGUENGUELI

Scientific name	Trade name		NWFP use		Name of NWFP	Uses
	Local name		No	Yes		
<i>Entandrophragma cylindricum</i>	Sapelli	Mboyo		•	Caterpillars Bark	Food Medicines
<i>Autranella congensis</i>	Mukulungo	Banga		•	Bark	Medicines
<i>Triplochiton scleroxylon</i>	Ayous	Gbado		•	Caterpillars Bark	Food, Seasoning
<i>Melicia excelsa</i>	Iroko	Mobangui		•	Bark	Medicine
<i>Gambeya</i> spp.	Longhi	Mongadje		•	Bark	Medicine
		Endjombo		•	Honey	Food
<i>Aningeria</i> spp.	Aniégré	Goyi, mokété	•			
<i>Entandrophragma condollei</i>	Kossipo	Mbagui		•	Roots/leaves	Medicine/salt/ aphrodisiac
		Popo		•	Caterpillars	Food
<i>Entandrophragma angolense</i>	Tiamá	Gbaté		•	Caterpillars	Food
		Dembia		•	Caterpillars	Medicine
<i>Astonia boonei</i>	Emiènne	Gouga		•	Bark	Medicine
		Mobengu		•	Fruits	Bait
<i>Entandrophragma utile</i>	Sipo	Goye		•	Bark	
<i>Diospyros</i> spp.	Ebene	Lembé		•	Bark	Aphrodisiac

Source: CIFOR surveys, 2006.

Of the 15 top timber species listed by local people (Table 11), only one was of no NWFP value to them.

As regards animal-based NWFPs, 25 out of the 32 listed animal species (78 percent) showed a decrease in availability, 2 an increase (6 percent) and 5 no change (16 percent) after logging (Table 12).

The increased availability of some species (e.g. crayfish and grasscutters), after timber harvesting, is associated with the increase in more palatable herbaceous undergrowth at the forest floor after the removal of middle-storey and emergent trees. The result is that canopies are opened allowing greater irradiance for the photosynthetic activity of plant species consumed by grasscutters. Crayfish benefit from more debris and sunlight reaching the surfaces of rivers and streams after logging.

For those species that have remained relatively the same after logging, the villagers believe that the animals moved away from the noise of logging vehicles and chainsaws and then returned to their former habitat after logging.

TABLE 12
ANIMALS HUNTED BEFORE AND AFTER LOGGING AND THEIR USES, NGENGUELI

Scientific name	Local or common name	Uses	No. hunted before logging (no./week)	No. hunted after logging	Local price	Price in Bayanga	Change after logging
	Kororo	C&S*	2	0-1	1 000	1 500	Decrease
<i>Cephalophus callipigus</i>	Mossome/guendi/ngadi	C&S*	5	0-1	5 000	7 000	Decrease
	Gbe	C&S*	3	3	500	1 000	Same
	Ngbom	C&S*	10	1	5 000	7 000	Decrease
<i>Testudo</i> spp.	Koudou (Ba'aka) / tana (Baya)	C&S*	8	2	500	1 000	Decrease
<i>Tragelaphus spekei</i>	Mbouri (Sitatunga)	C&S*	1	0-1	11 000	20 000	Decrease
	Ndjombe	C&S*	5	1	5 000	7 000	Decrease
	Mbenguene	C&S*	5	2	4 000	5 000	Decrease
<i>Cephalophus monticola</i>	Dengbe/mboloko (Ba'aka)	C&S*	5-10	0-2	1 500/half	2 400/half	Decrease
<i>Cephalophus</i> spp.	Gbaibé	C&S*	2-3	0-1	1 500-2 000/leg	2 000/leg	Decrease
<i>Atherurus africanus</i>	Ngomba/ngueze Ba'aka (porcupine)	C&S*	5-10	1-2	1 500-2 000	3 000	Decrease
<i>Cephalophus sylvicutor</i>	Bemba (Dos jaune)	C&S*	5-10	0-3	1 500/half		Decrease
<i>Cercopithecus</i> spp.	Makako (monkey)	C&S*	5-10	2-3	1 500-2 000		Decrease
<i>Colobinae</i> <i>Colombe</i>	Birds (pigeon)	C&S*	4-10	5-8	300-500		Decrease
<i>Cercopithecus cephus</i>	Mambe	C&S*	3	0-1	3 000	3 500	Decrease
<i>Cercocebus galiretus</i>	Moloka or essadu (mangabeys)	C&S*	1-2	0-1	3 000	3 500	Decrease
<i>Cercocebus neglectus</i>	Mossila	C&S*	1-2	0-1	3 000	3 500	Decrease
<i>Colobus guereza</i>	Kalu	C&S*	1-2	0-1	3 000	3 500	Decrease
<i>Cercopithecus albigena</i>	Nganda (albigena)	C&S*	1-2	0-1	3 000	3 500	Decrease
	Nyou	C&S*	1-2	0-1	3 000	3 500	Decrease
<i>Thryonomys swinderianus</i>	Grasscutter cibissi (Bende)	C&S*	2	3	2 000	2 000	Increase
<i>Syncerus</i> spp.	Buffalo	C&S*	2	0	25 000		Decrease
<i>Cephalophus dorsalis</i>	Anti. Dos jaune (Bemba)	C&S*	2	2	12 000		Same
	Birds (deke)	C&S*	2	2	1 000		Same
<i>Varanus varan</i>	Varan (monitor)	C&S*	3	2	1 000		Decrease
<i>Bitis</i> spp.	Viper	C&S*	2	2	3 000		Same
<i>Python sebae</i>	Boa	C&S*	2	0-1	10 000		Decrease
<i>Tragelaphus scriptus</i>	Mbouri	C&S*	2	2	12 000		Same
<i>Apis mellifera</i>	Honey (koma)	C&S*	++	+	100/50 g	200/50 g	Decrease
<i>Termitomyces</i> spp.	Boboh (termites)	C&S*	1 basin	½-1 basin	50-100/glass (30 cl)		Decrease
<i>Aphanomyces astaci</i>	Kpassa (crayfish)	C&S*	½-1 basin	1 basin	100/glass (30 cl)		Increase
<i>Achatina</i> spp.	Ngoloh baya / snails	C&S*	3-5 basins/day	0-1 basin			Decrease

* Consumption & sale

Source: CIFOR surveys, 2006.

The reasons put forward for the decrease in more than 78 percent of the species of animal-based NWFPs included:

- Species were sensitive to the noise of logging equipment (chainsaws and logging vehicles), so they moved away and changed their habitats.
- The opening up of roads into the forest led to easy access by poachers, and the increased hunting rates decimated the animal populations.
- The reproductive cycles of animals were disrupted during logging, leading to the death of young ones in some cases.
- Timber harvesting provided a new market for bushmeat as the number of people living in and near the village increased dramatically. Hunting pressure by the villagers themselves was on the increase for income generation.

PERCEPTION OF VILLAGERS WITH RESPECT TO SBB

The people of Nguengueli were generally positive about the presence of SBB in their forests because they showed some regret about the abrupt closure of the company. They were eager to see the return of the company because they believed their economy was booming when the company was operating. They listed some advantages and disadvantages associated with the presence of the logging company, but hoped that the return of the company would come with some modifications in order to reduce the disadvantages. The advantages they listed were:

- residues from mill site for construction;
- rapid sales of agricultural products owing to the emergence of a new market;
- reduction in unemployment because the company employed some youths;
- easy transportation to Bayanga associated with better state of roads and availability of vehicles.

The local people listed the following disadvantages:

- animals moving away because of the noise of logging vehicles/chainsaws;
- destruction of trees that provide NWFPs (e.g. caterpillars);
- opening up of tracks in the forest, which favours poaching;
- incidence of an unknown disease that led to the death of many Ba'aka people.

PERCEPTIONS OF SBB RESOURCE PERSONS

From when SBB started operations (April 1999) until suspension of activities (November 2005), the company never had any problems with the local people. However, the absence of local conflicts was more by chance than by design because the company never had any direct arrangements (consultation and negotiations) with the local population surrounding the forest. Rather, the company entered into partnership with the Bayangan Project. This is a project for the sustainable management of the Bayangan forest following an accord signed in 1990 by the government of the Central African Republic, World Wild Fund for Nature (WWF) and Gesellschaft für Technische Zusammenarbeit (GTZ). The few contacts with the villages were through the chiefs, who usually asked the company to build houses of sawnwood for them. Such requests were usually complied with.

Despite the absence of open conflicts or any administrative infractions, SBB departed unceremoniously leaving behind timber in the forest, at the sawmill yard, and several cubic metres of sawnwood at the factory (Plates 1 and 2).

PLATE 1
LOGS ABANDONED IN THE SAWMILL YARD



PLATE 2
SAWNWOOD ABANDONED AT SAWMILL



The company ceased operations and left behind more than 70 percent of the logs felled in that period in the forest and at the sawmill yard. In terms of technical provisions, the company respected sound logging guidelines by using proper logging equipment and setting logging camps and gantries. Social realizations in terms of roads and schools were encouraging, although some local projects were never realized because the money for projects went through the mayor's office, which suffered from misappropriation in certain cases. In future, it might be recommended that the successor forest company should engage directly in realizing projects for the local people.

As regards the issue of the company being aware of the possible impacts of timber harvesting on the availability of NWFPs, the resource person of SBB affirmed that the company was quite aware of the local value of caterpillars and other NWFPs but that it had to operate in a business-like way in order to reduce costs and maximize profit. The expectations of the local people are sometimes too high and overambitious. For example, the local people want employment for their children, most of whom do not have the skills and qualifications. They also need schools, health centres, water, good roads, etc. It is not possible for the company to be involved in these ventures as well as keep the company running. Marketable trees must be felled and sold in order to make money despite their NWFP values to local people. He reiterated that the company had tried to ensure that timber trees were not felled around farms.

CHAPTER 5

SUMMARY OF LESSONS LEARNED

According to Karsenty (2005), more than 36 percent of forest in the Congo Basin's humid forest is already within logging concessions, and the pressure to expand is increasing. There is now a greater focus on sustainable forest management because countries have gone from a system of awarding of licences by mutual understanding without compulsory management plans to a concession awarding system that follows a public purchasing procedure (open bidding) that is more or less transparent. With this, there is the obligation to draw up management plans alongside a social responsibility contract. What remains unclear is the extent to which forest products (NWFPs) of socio-economic value to local people are taken into consideration in these guiding documents, as well as how to ensure that logging companies respect the specifications relating to such products.

The Congo Basin forests are of great economic importance to the countries of the region, contributing up to 18 percent to the GDP of the Central African Republic and 20 percent to the foreign exchange earnings of Cameroon. Such revenues are calculated mainly from timber harvesting, while the value of NWFPs is generally not accounted for in national statistics. Failure to show the importance of NWFPs in national statistics might explain why there are few or no strong and clear policy statements defending the role of NWFPs in management plans, forest codes and logging control strategies. These important tools are necessary in order to ensure good governance and to enable a move towards sustainable forest management in the Congo Basin.

This study has documented many NWFPs of great significance to the welfare of the local population in terms of food security, income generation and health. These products are either plant-based or animal-based. The timber companies are aware of the possible impacts of their activities on the resources collected from the forest by local populations. However, they have to do business following business norms in order to make a profit. This means cutting down marketable timber trees irrespective of whether they have local NWFP values and employing staff based on skills and qualifications. At the level of the logging companies, a general effort is being made to reduce negative ecological impacts and to provide social amenities. However, there is still the need to strengthen dialogue and collaboration with local people. This may require sensitization of local people about national forest laws, benefit-sharing mechanisms of forest revenues, and the demarcating of an appropriate portion of forests for the activities of local people.

According to the local people, the overall impact of timber harvesting on the availability of NWFPs is negative as most plant-based and animal-based NWFPs suffer from a reduction after logging. Notable examples include NWFPs from tree species exploited for timber, such as sapelli and ayous for caterpillars, and iroko and ebene for medicines. Reduction in availability varies with locality (locally in the forest or in the urban consumption centres). For example, the perception of the villagers is that there is a general decrease in the availability of caterpillars. Social, economic and/or ecological factors may explain the general decrease in the availability of NWFPs after logging.

ECONOMIC ASPECTS

Changes in the economic focus of youths after logging companies depart from their villages leads to migration to other villages (e.g. Mboy and Libongo in Cameroon and Nola in the Central Africa Republic), in search of employment either in the gold and diamond mining industry or with other logging

companies. With logging companies, the local people become more conscious of the cash value of goods and they are more motivated to become involved in regular salaried activities. This has reduced the number of people engaged in the gathering of some NWFPs for commercial purposes.

Another important economic factor is the opening of new market outlets associated with the influx of populations from other areas. The emergence of new markets and the urge to make more money from such opportunities imply greater demand for desired forest products. Such pressures on resources lead to faster depletion of resources than before logging. This is true for most animal-based NWFPs (more than 78 percent of listed NWFPs declined in availability after six months logging in Nguengueli village). Therefore, migration of people from other regions to the logging sites leads to greater pressure on available forest products. This makes it more difficult for local people to obtain the same quantity of products as hitherto without trekking longer distances and spending more time in the forest.

SOCIAL ASPECTS

Cultural changes are associated with changes in habits. Young people spend less time in the forest than before and seek more modern lifestyles. New people coming to the logging villages bring new cultures and eating habits and harvest previously unknown or underexploited products. Such was the case with tondo, njansang (*Ricinodendron heudelotii*) and *Irvingia* spp., whose commercial value became apparent with the installation of the logging company in Kika.

ECOLOGICAL ASPECTS

The scarcity of some NWFPs is associated with the autecology of individual species, with production responding to flowering patterns, seasonality and microclimate changes after timber harvesting. Some NWFPs are usually rare in some years and people have to make an extra effort in terms of time and distance walked in order to obtain appreciable quantities. This is associated with the phenomenon of good and bad seed/fruited years for fruit-bearing plants. According to the villagers, caterpillar production is higher in undisturbed forests, and once a forest is disturbed by logging activities, it becomes difficult for them to find caterpillars for many years. This adds to the fact that forest exploitation removes the large trees usually inhabited by caterpillars. According to the villagers, smaller-diameter trees do not favour caterpillar production.

Some NWFPs become scarce because of the increased undergrowth at the forest floor after logging, which makes movement and access to them more difficult. Such is the case with mushrooms and snails. However, logging favours the growth of some species such as njansang and *Gnetum* because they grow well in logging gaps and secondary forests. The major problem lies with the thicker herbaceous undergrowth that does not favour the free movement of people after logging.

With regard to similarities or differences in the timber and NWFP portfolios in the two countries, it was observed that in both Cameroon and the Central African Republic there are great similarities among logging companies in terms of the top timber species exploited. For example, this study has documented that three tree species, i.e. sapelli (*Entandrophragma cylindricum*), ayous (*Triplochiton scleroxylon*) and iroko (*Melicia excelsa*), constituted 93 and 86 percent of timber production for ALPICAM Kika and SBB, respectively. These timber species also provide NWFPs (caterpillars and medicines) to local people in both countries. This similarity holds true for the other NWFPs such as *Gnetum* spp., *Irvingia* spp., snails, tondo, and bushmeat species found in both countries. Such observations suggest that there are few variations in the forest biodiversity

of the two countries as well as little variation in the habits of the indigenous people inhabiting the forests. The implication is that similar policy and technical tools can be used to manage the forests of the two countries. However, their current forestry policies vary significantly.

COMPARISON OF FORESTRY POLICIES

A comparison of the forestry policies of Cameroon and Central African Republic as indicated in Table 13 gives an idea of the changes and the lack of coherence concerning the sector in the Congo Basin.

TABLE 13
COMPARISON OF THE FORESTRY POLICIES OF CAMEROON AND THE CENTRAL AFRICAN REPUBLIC

Variable	Cameroon	Central African Republic
Responsibility for the elaboration of management plans	Concessionaire	State
Community forests	Yes	No
Communal forests	Yes	No
Fiscal decentralization	Yes	No
Limit of concessions size	200 000 ha	Unlimited
Need for user rights defined for NWFPs in cahier des charges	Yes, but need to be enforced	Unclear
Concession allocation process	Auction	Auction
Social responsibilities defined	Yes	Yes
Date of new forestry law	1994	2000
Duration of concessions	15 years renewable	Lifetime of the company

Table 13 shows that the two countries share common approaches to only 20 percent of the variables. This indicates the extent to which the countries of the Congo Basin have yet to harmonize their forestry policies as accepted in the 1999 Yaoundé Declaration. COMIFAC's role in the implementation of the Convergence Plan has to be taken seriously, in order to ensure that the forests of the Congo Basin are managed in a sustainable manner.

COMIFAC and its member countries must work together to harmonize and thus minimize divergence in concession sizes, duration of concessions, concession allocation processes and responsibility for the elaboration of management plans. Unlimited concession sizes and the unspecified duration of concession rights, as observed in the Central African Republic, may encourage extensive exploitation of few highly prized timber species over very short time span. Following exploitation of these species, the concession is often abandoned. This may explain the sporadic history of logging in the Bayangan region of Central African Republic, where the estimated rate of logging damage was 30 percent (Forest Monitor, 2001).

The problem lies with the fast removal of desirable trees, resulting in higher levels of harvesting damage as well as the circumvention of the obligation to respect social responsibility contracts. In the former case, product harvesting per unit area are neither specified in management plans nor monitored and controlled. Driven by the hit-and-run scenario, there is no incentive for concessionaires to use sustainable harvesting techniques because there are no serious penalties for abandoning concessions unceremoniously. This encourages over-harvesting and waste and in the final analysis, the money paid by the concessionaire for timber extraction does not equate with the economic, environmental and social costs of NWFPs availability.

Another point that needs to be addressed is the possible weaknesses embedded in the elaboration of management plans by concessionaires. The Central African Republic is the only country in the Congo Basin that has set up a competent public institution to elaborate forest management plans. There is need for other countries to follow suit because no concessionaire would elaborate a management plan that would not meet its company's objective of maximizing profits.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

GENERAL RECOMMENDATIONS

The forests of the Congo Basin are a major economic asset. With the drive towards sustainable forest management, consideration must be given to all stakeholders when designing policy, management and control tools that minimize the negative impacts of logging and encourage multiple benefits from a greater array of forest products. To date, NWFPs have not received due attention in most management plans, forest codes, and control strategies. Logging companies acknowledge the importance of NWFPs in the livelihoods of the communities adjoining their forest concessions. However, clarity is needed on the policy governing forest concessions, access rights to NWFPs by local communities, and the rights of the companies to do business and make normal profits. This requires the full involvement and sensitization of both the logging companies and the local communities. To this effect, the policies governing forest exploitation in the Congo Basin have to reflect local needs for survival as well as the perceptions of the timber companies.

A suitable approach might involve the following actions:

- The timber company establishes a platform where local communities may voice concerns and contribute to solutions related to the availability and accessibility to NWFPs. As was observed in this study, this has not yet happened.
- The local population, the administration and the logging company together draw up the “cahier des charges” or social responsibility contracts and clearly define the role of NWFPs in the management plans of concessions. (Current forestry laws in the region could be revised, taking NWFPs in the sustainable management of the forest.)
- Consultation leads to the creation of an agroforestry zone. This would enable the local people to operate in their own domain while the logging company operates on its own area, thereby, reducing the chances of conflict.
- Systematic inventories of timber species with NWFP values are conducted. The results may enhance the possibility of allocating some trees to the logging company, with the remainder for local use.
- Timber companies are compensated by the government (e.g. through tax relief) for not exploiting all timber species with local NWFP values.
- Alternative activities are developed that the local communities may become engaged in, such as small-scale forest-based enterprises, with special attention to the most important NWFPs in the region.
- Local NGOs become involved in the overall strategy of education and information dissemination on the rights of local communities and the rights of other stakeholders in the forest. These approaches could help prevent or mitigate possible conflicts.
- The monitoring of the activities of logging companies is enforced in the region by improving the required logistics and personnel aspects. This would ensure that social responsibilities and logging standards are respected. The respecting of logging

standards (girth limits, timber harvest plans, timing of logging, listing of mother trees, rotations and annual allowable cuts) would reduce logging damage and, therefore, reduce the impacts on the availability of NWFPs.

- There are sustained efforts to improve forest governance and reduce illegal logging (which has greater negative impacts on the availability of NWFPs as logging guidelines are ignored).
- Disparities in the forestry policies of the countries in the Congo Basin are minimized or eliminated.

In conclusion, this study has highlighted several areas of concern related to timber harvesting and the availability of NWFPs. More information is still needed to determine the full extent to which the livelihoods of local communities are affected by timber concessions and in particular how widespread these effects are across the region. In addition multiresource inventories should be conducted in order to estimate the actual quantities and volumes of NWFPs in the Congo Basin forests. This information may be used to assist the development of marketing strategies for NWFPs.

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