COMMUNITY DEVELOPMENT AND KNOWLEDGE MANAGEMENT FOR THE SATOYAMA INITIATIVE (COMDEKS)

CAMEROON PROGRAMME LANDSCAPE STRATEGY

Contents

Abbreviations and acronyms

CAR: Central African Republic

CBD: Convention on Biological Diversity

CBO: Community Based Organization

COMDEKS: Community Development and Knowledge for the Satoyama Initiative

COP: Conference of the Parties

CSO: Civil Society Organization

GEF: Global Environment Facility

CIG: Common Initiatives Groups

IRAD: Institute of Agricultural Research for Development

MINADER: Ministry of Agriculture and Rural Development

MINEPIA: Ministry of Livestock, Fisheries and Animal Industries

MDG: Millennium Development Goals

NGO: Non-governmental Organization

NSC: National Steering Committee

PACC: community-based adaptation to climate change

SEPL: Socio Ecological Production Landscape

SGP: Small Grants Programme

UNDP: United Nations Development Programme

VDC: Village Development Committee

Executive Summary

Bogo has been identified as a target socio- ecological production landscape of Cameroon in participatory manner by the SGP National Steering Committee of UNDP Cameroon GEF/ SGP COMDEKS Cameroon for the Satoyama Initiative.

The Bogo landscape, located in the Sahelian zone, lies in the southern part of the Lake Chad Basin and the western foothills of the Mandara Mountains. This subdivision has a surface area of 93000ha with a population of 95,230 inhabitants, in which 78% live in rural areas with a density of 102hbts/km². It is jointly administered by an administrative authority (the sub-divisional officer) and a traditional authority, namely the Lamido of Bogo (who is also mayor of the Bogo municipality). Bogo district is divided into 12 cantons. Each canton is ruled by a Lawanes who is assisted by neighborhoods leaders called Djaouros. The 12 cantons with some holding village development committees (VDCs), have been chosen for the implementation of the baseline survey.

The Bogo landscape is unique in this Sahelian region. It is endowed with diverse natural resources with agricultural systems, hydro and rich alluvial soils (despite the dry climate), a diversified pasture and cultural system conducive to tourism and which provides a solid foundation for economic activities and sustainable development.

The main environmental challenges facing the Bogo landscape are linked to increased destruction of natural habitats (threats on plants and birds lead to the loss of biodiversity and reduction of ecosystem services) some non-sustainable agricultural practices; degradation, soil erosion and crusting (*hardés* in local idioma) ; inadequate livelihood means (lack of funds), the lack of women empowerment; health problems (malaria is endemic with at least 300 deaths per year) and weak institutional capacity to support conservation and production.

The consequences of these environmental challenges faced in the area are amongst others the loss of biodiversity, land degradation and reduction of soil fertility, scarcity and loss of flora and fauna, increasing erosion and widespread poverty. In order to promote healthy socio-ecological systems productions for the conservation of biodiversity while meeting socio - economic needs of communities living in the landscape, a participatory transformative strategy was developed by stakeholders. The overall long-term objective of this strategy is to improve the socio -ecological production and resilience of the landscape through community based activities.

The COMDEKS program seeks to achieve the following results: (a) The conservation of natural and semi-natural habitats and ecosystem services in the Bogo landscape (wildlife habitat, agro-biodiversity areas); (b) The implementation of sustainable agricultural and pastoral practices favoring traditional production techniques', the adoption of new technologies; (c) The development and strengthening of livelihoods and well-being of social target groups (women and youth) in the landscape by developing livelihood enterprises (micro credits) adapted to the local tradition and culture and (d) Institutional capacity strengthened at the landscape level to achieve the integrating goal of conservation and production in the management of the target landscape.

The successful implementation of this country strategy will ultimately : (a) Reduce the degradation of natural as well as semi-natural landscape in order to preserve native biodiversity and promote the adoption of sustainable agricultural and pastoral practices; (b) Enhance

sustainable livelihoods and well-being of all social groups (including women and children); (c) Incorporate traditional ecological knowledge with modern science to ensure a stable supply of ecosystem services and (d) Strengthen the institutional capacity and integrated forms of co-management of traditional land holdings.

It is expected that the COMDEKS country programme landscape strategy for Cameroon, will finally propose appropriate concrete measures through community projects, which must be developed and implemented by eligible non-governmental organizations (NGOs), civil society organizations (CSOs) and community based organizations (CBOs).

General Introduction

Landscapes is composed of visible features of a piece of land, including the physical elements of landforms such as mountains , hills, rivers , lakes and the sea; the biological elements of land cover including vegetation and wildlife; human elements such as forms of land use , buildings and infrastructure, cultural and spiritual values, and then, finally, the transitional elements such as weather.

A landscape approach is based on the principles of a diverse natural resource management that recognizes the value of different ecosystem services for multiple stakeholders, and how these principles lead them to pursue different objectives or land use strategies for subsistence. This approach is extended to societal concerns related to the conservation and development, including increased integration objectives of poverty alleviation, agricultural production and food security, while focusing on adaptive management and involvement of stakeholders.

The importance of biodiversity management and building resilient rural communities in the landscapes of socio-ecological production has become increasingly necessary due to their relevance in supporting key ecosystem functions and the role of biodiversity in the livelihoods of millions of people worldwide. Thus, the conservation of biodiversity involves not only preserving pristine environments, but also that of the natural environment influenced by man such as farmland, pastures and water systems, that people have developed and maintained sustainably over centuries.

Indeed, the natural environment influenced by human activities often provide habitat for a wide variety of terrestrial and aquatic plant and animal species, hence their important role in maintaining and enhancing biodiversity. Landscapes as well as sustainable practices and knowledge are too much threatened by unplanned urbanization, industrialization, overexploitation of natural resources and erosion, climate change and natural disasters as well as rapid population growth in rural areas. Therefore, urgent measures are needed to permanently preserve these types of natural environments influenced by man through broader global recognition of their value. This is the raison d'être for the Satoyama Initiative whose implementation is provided by the UNDP through COMDEKS.

Satoyama is a Japanese word that can be broken down into two words: *yama* means mountains, woodlands, forest and savanna; then *sato* which means the surrounding villages. It is used to define a landscape in which human activities take place and are practiced in harmony with nature.

The purpose of this initiative is to promote the sustainable use and management of natural resources in the socio-ecological production landscapes (SEPL). The Satoyama Initiative aims to maintain, rebuild and revitalize the socio -ecological production landscape for the conservation of biodiversity, while addressing socio- economic needs of local communities living in the area, including by providing livelihoods. Indeed, among the benefits attributed to the Satoyama Initiative, we can notice:

- The realization or achievement of the Millennium Development Goals (MDGs) for poverty reduction;
- Adaptation to climate change;
- The achievement of sustainable management and conservation of biodiversity;
- Improving livelihood and the human condition;
- Social inclusion and equity.

Funded by the Japanese Biodiversity Fund setup within the Secretariat of the Convention on Biological Diversity (CBD), the Community Development and Knowledge Management for the Satoyama Initiative (COMDEKS) is a unique global project implemented by UNDP and delivered through the Small Grants Programme, as a pilot flagship of the International Partnership for the Satoyama Initiative. The COMDEKS program, already experienced in more than 10 countries, seeks to develop livelihood activities and sustainable management of biodiversity in local communities, to rebuild and revitalize the socio-ecological production landscapes through collaborative and adaptive management. Indeed, it appears as a very useful tool to better understand and support the natural environment influenced by man for the benefit of biodiversity and human well-being.

Cameroon is one of the countries participating in the second phase of the global pilot program. Bogo has been identified as the socio-ecological production landscape COMDEKS Cameroon in a participative manner by UNDP Cameroon through the SGP National Steering Committee / COMDEKS Cameroon. The project proposal on the study of the baseline was assessed by the National Steering Committee (NSC) of the SGP / COMDEKS Cameroon for granting funding in June 2013.

This strategy has been developed with stakeholders between September and October 2013. It will guide the implementation of COMDEKS activities in Cameroon for a period of 02 years. The overall long-term objective of this strategy is to improve the resilience and socio - ecological production landscapes through community based activities.

Its implementation will reduce land and natural or semi -natural habitats degradation in the landscape to preserve local biodiversity and promote sustainable agricultural and pastoral practices. It will also improve sustainable means of livelihoods and well-being of all social groups (including women and children). Lastly, it will incorporate traditional ecological knowledge with modern science to ensure a stable supply of ecosystem services and strengthen the institutional capacity and integrated forms of co-management of traditional land tenure.

This landscape strategy program COMDEKS – Cameroon, begins by analyzing the situation of priority sectors of Bogo. Then it finally proposes concrete and appropriate measures (indicators and impacts) through community projects, which must be developed and implemented by eligible non-governmental organizations (NGOs), civil society organizations (CSOs) and community based organizations (CBOs). It ends with a monitoring and follow-up plan for knowledge management.

1. - Priority Area for COMDEKS in Cameroon

1.1. - Landscape Identification

The socio-ecological production landscape identified for the COMDEKS project in Cameroon is the area of Bogo. Administratively, Bogo is a district of the Diamaré Division in the Far North Region of Cameroon. It is limited southwestwards by the Dargala District, at the North East by the Maga District, on the northwards by Petté and by the Maroua III Municipality and at the southeast by the Moulvouday District (Figure 1).

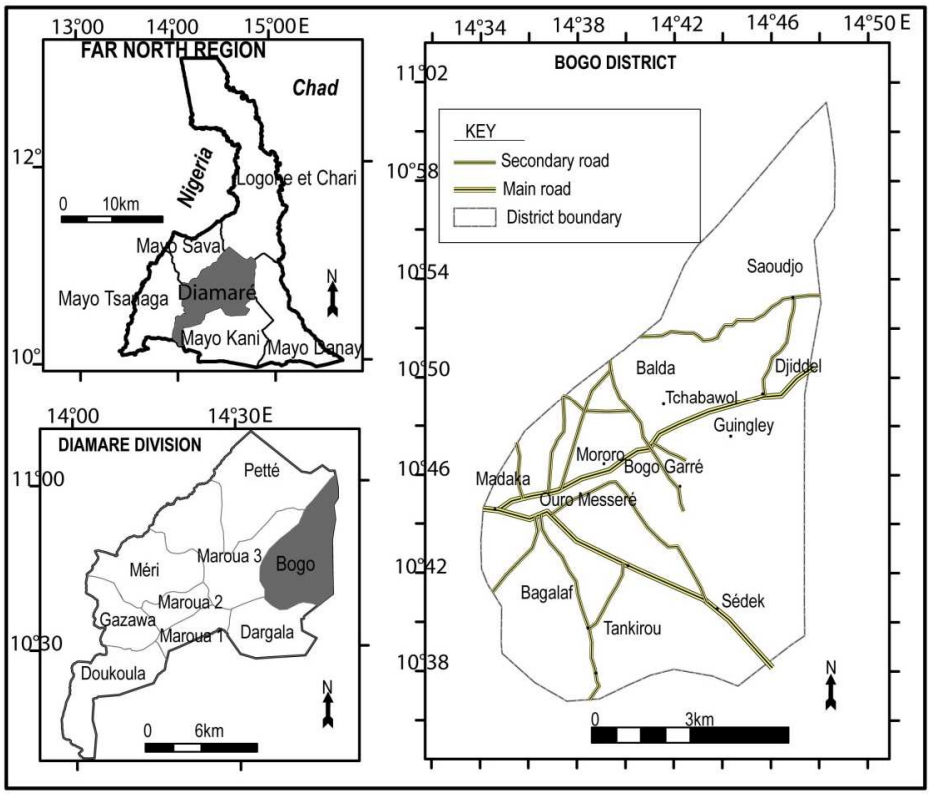

Figure 1: Location Map of Bogo within the Far North Region and the Diamaré Division

It covers an area of 93000ha with a population of 95,230 inhabitants among which 78% live in rural areas. The population density is 102hbts/km². It is jointly ruled by an administrative authority (the sub-prefect or Sub divisional officer) and traditional authority represented by the Lamido of Bogo (who is also Mayor of the Bogo Municipality).

Bogo is located in the Sahelian zone of Cameroon. As the Nile is a gift to Egypt, we can say that Mayo Tsanaga is a gift to Bogo. For, the district is crossed abroad throughout its length by the Mayo Tsanaga River support the life and activities of most of the rural and urban populations. At least, Bogo District consists of two major topographic features : a large plain (310- 330m average) which gradually descends towards Lake Chad and a few hills that bristle South West Township of Bagalaf (*Hosséré* Goboré, 493m) and North West Township of Balda (*Hosséré* Balda, 679m).

1.2.- Description of the Bogo socio ecological production landscape

Bogo district extends between 10 °41'10" N and 14 ° 36'39"E. It is splitted into 12 cantons. Each of them is ruled by a Lawan assisted by local neighborhoods leaders called Djaouros. These 12

cantons with some holding village development committees (VDCs), were selected for the implementation of the baseline survey which led to the strategy (Figure 2).

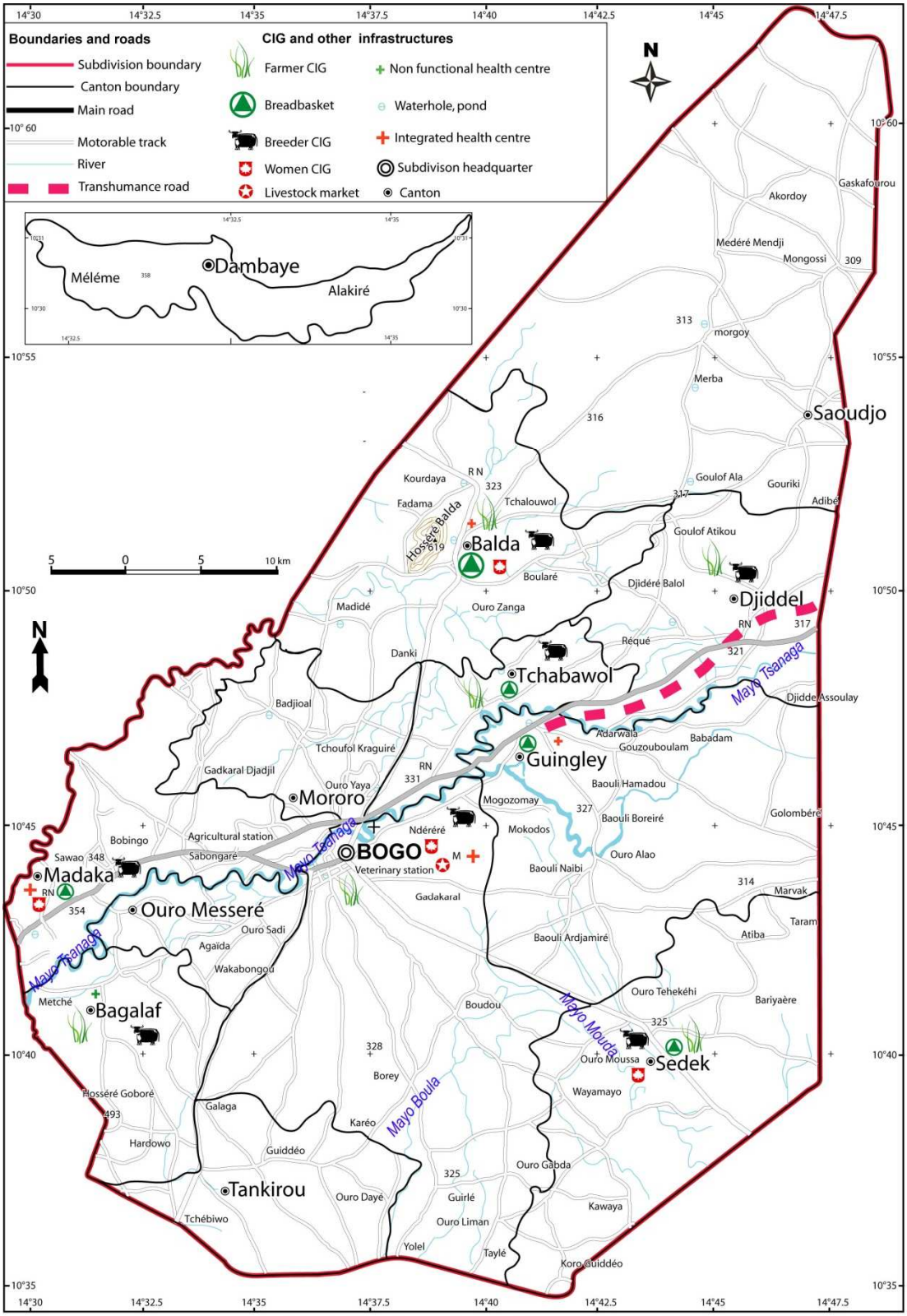

Figure 2: Townships and resources of the Bogo landscape

The Bogo District belongs to the dry tropics (7-8 dry months against 4 – 5 rainy months/year). It is characterized by a Sahelian climate with low monomodal rainfall regime (500- 700 mm), high temperatures (28-35°C) and low humidity, swept by hot and dry winds (Harmattan). This Sahelian area has two types of landscape plants: thorn plants like *Acacia seyal, Acacia nilotica, Tamarindus indica and Balanites aegyptiaca* as well as periodically flooded prairies called *Yaérés*. There are some dominant grassland like *Echinochloa stagnina* (bourgou) *Vetiveria nigritana*, *Hyparrhenia rufa* and *Oryza* (wild rice).

1.3. - Justification of the Bogo landscape selection

Due to the presence of migratory birds and *Yaérés* wetland, Bogo represents a hot-spot of animal biodiversity (birds) of national and regional significance poorly known in Cameroon. It has unique natural assets in the Sahel region for the livestock transhumance from Cameroon, Nigeria, Chad and Central Africa Republic (CAR). So, it holds at least three ecosystems functions:

- Integrating agriculture - farming and agriculture - Fishing
- Agroforestry through the Neem tree (*Azadirachta indica*) and fruit trees including mango (*Manguifera indica*) and guava (*Psidium guajava*)
- The transhumance for large herds coming from Chad and transit to Nigeria (Niger too) not to mention serious potential of milk production. Moreover, Bogo, the headquarter and center of these cantons is home of the largest livestock market in the region.

In any case, at the level of ecosystems service, Bogo forms a mosaic of landscapes combining picturesque hill environments with diverse habitats and land use patterns, urban landscape (Bogo Garré or center) and rural (villages and townships), farmlands and rangelands for livestock and transhumance, natural reforested areas, agroforestry plantations of mango and guava trees, periodically flooded meadows, wetlands and water ponds.

1.3.1. - A high agricultural and natural biodiversity

Local agriculture covers over 10 species of products consumed locally in food systems. It counts a variety of cereals : sorghum (*Sorghum bicolor*), mouskwari, sesame (*Sesamum indicum*), finger millet (*Eleusine coracana*), millet (*Panicum miliaceum*), corn (*Ze mais*), rice (*Oryza sativa or Oryza glaberrima*); groundnuts (*Arachis hypogaea*), cowpea (*Vigna unguiculata*), onions, beans (*Phaseolus vulgaris*), sweet potato (*Ipomoea batatas*) tubers with cassava (*Manihot esculenta*), vegetables including okra (*Hibiscus esculentus*), the foléré (*Hibiscus sabdariffa*); vegetable crops including calabash (*Crescentia cujete*), cucumber (*Cucumis sativus*), melon or squash (*Cucurbita maxima*), eggplant (*Solanum melongena*), some tomatoes (*Solanum lycopersicum var. lycopersicum*) without forgetting the cotton, single industrial plant that requires for its culture many inputs. Some cantons such as Tchabawol and Bagalaf have started the experience of growing soya bean (*Glycine max*).

The ability to retain water during the dry season in this dry environment explains the abundance and diversity of livestock including cattle (*Bos taurus*), sheep (*Ovisaries*), goats (*Capra hircus*), donkeys (*Equus asinus or Equus africanus asinus*), horses (*Equus ferus caballus or Equus caballus*). Water retention ability also makes this area to become a transhumance zone par excellence where animals are used for agricultural traction activities and transport within the

Diamaré plain. The strong hydrographic network explains why Bogo townships are habitat for a diverse seasonal birds among which one can recognize Cattle Egret (*Bubuculus ibis*), the Intermediate Egret (*Egretta intermedia*), the African cormorant (*Phalacrocorax africanus*), Egrets (*Egretta ardesiaca*). Outside guinea fowl (*Numida meleagris*), ducks (*Anas*) and geese (*Anser*) that are frequently encountered, there are a few specimens of wildlife including wild warthogs (*Phacochoerus africanus*) and hyena (*Crocuta crocuta*). In the Mayo Tsanaga River and floodplain, fishing is active and involves species such as catfish (*Silurus glanis*), *Tilapia sp*, eel and carp (*Cyprinus carpio*) that are consumed and sold locally.

1.3.2 - . Socio- cultural importance of Bogo

Although sacred traditional conservation areas decreased, Bogo appears with its (12) cantons as an area with high potential for tourism related to its physical features (scenic hills of *hossérés* Balda and Goboré), crafts with animal skins, artisanal fishing, fantasia, birds, etc. . Bogo is inhabited by people with deep cultural beliefs that have guided the conservation of biodiversity and the protection of sensitive and ecological zones. The landscape is marked by forms of adaptation to local climatic conditions as well as geographical, cultural and socio -economic conditions. Thus, the resident population of the landscape depends largely on the environment. Species such as the Baobab (*Adansonia digitata*), Neem (*Achzadirata indica*) and *Acacia faidherbia* etc. are used as firewood, canoes building material, sometimes forage, and are part of traditional medicine plants.

1.3.3.- Resilience native landscape

During the last 5 years, the GEF SGP has worked with some local communities in the Biodiversity conservation practices (building of improved stoves) and community-based adaptation to climate change (PACC). Among those projects one can underlined, the rehabilitation of degraded land in the Mokolo plain and the projects fighting against climate change in the Mora plain. Also, in the Meri District (Mbozo village located at 60km from Bogo), the GEF SGP funded at least 06 community social equipments for the collection and storage of rainwater from the roofs of houses. These interventions have helped to raise awareness and promote a culture of conservation of plant biodiversity by limiting the pressure on wood resources with the fabrication of improved stoves.

Current thinking around COMDEKS Bogo centers on pursuing these efforts of resource management approach by socio-ecological production landscapes for the conservation of biodiversity and climate change. This requires the protection of biodiversity through the revitalization of degraded areas or degraded agricultural land (*hardés*) for resilience.

1.4. - COMDEKS Cameroon Consistency with GEF-SGP Country Strategy Program

The selection of Bogo as landscape for COMDEKS project in Cameroon is part of the strategic objectives of the GEF-SGP OP5 program strategy for Cameroon which aims to integrate biodiversity conservation and sustainable use in production areas through community base management of natural resource conservation while taking into account the known or anticipated impacts of climate change.

COMDEKS Cameroon will contribute to the achievement of OP5 as follows:

- ♣ Protection of socio -ecological production Landscape for the benefit of biodiversity and human well -being;
- ♣ Maintenance and reconstruction of landscapes in which land and natural resources are used and managed more sustainably ;
- ♣ Rehabilitation and management of threatened habitats for the conservation and promotion of community development sites, to support the sustainable use of biodiversity through training in setting up projects , the provision of small loans to women , the handicrafts and ecotourism, appropriate intervention techniques and crop processing , storage and packaging activities supporting livelihoods and traditional medicine.

2. - Situation Analysis

2.1. - Human Resources and Production

According to the 2010 census, Bogo has a total population of 95,230 inhabitants with 22 % of urban population. This population is composed exclusively of Mousgoum, Moundang, Massa, Toupouri, Kotoko , Mbororos and Fulani. Poorly educated, the level of training and qualification of this population is not good. 63% are illiterate, 21% have an equivalent level of study in primary education, 12% have a level equivalent to secondary education and only 4 % have a higher education level. This reflects a sub empowerment and vulnerability of these local landscape actors.

2.1.1. - Household wealth and subsistence

The population thus described has 51 % men against 49% women. Communities in the townships are predominantly made up of farmers and breeders for at least 98% of the families. Therefore, the livelihoods of the communities come from agriculture, livestock and fisheries and to a lesser extent small business. Then, the biggest market of livestock (sheep, goats and cattle mainly) in the region takes place every Thursday at the heart of the Bogo City (Bogo Garré). This activity is added to the active transhumance which requires 1000CFA francs (i.e. US$ 2) per cattle head through the transhumance corridors. Moreover, these animals are also used for farm labor and transportation in this very isolated region. Overall, only 2% of household's revenues come from the formal sector.

In addition, land and properties are common household assets of the Bogo landscape. Other current assets include livestock, cash crops such as cotton, food crops, light equipment such as TVs in urban areas, radio etc. There is no rural community radio. The average annual household income in the area is about 75 000 to 150 000 CFA F, i.e. 150 to US$ 300

Several products such as cassava, sweet potatoes and millet are sold locally. It is also the case of seafood and livestock, but they are not integrated into urban markets. The prices are extremely low (50CFA francs for a cooked cassava package or 100 CFA francs the pile; i.e. US$0.1 to 0.2) . Demand is not strong. Agriculture is practiced on clay and alluvial soils (*karal*), sandy or loam soils. Sterile soils (*hardés*) are abundant and sometimes left to the pasture. However, it's become a real problem for grazers and farmers and raised conflicts. Nevertheless, these rudimentary techniques still maintain biodiversity, but latent land disputes between farmers and herders are not going without problem.

Agriculture, farming, artisanal fishing, hunting and small businesses are therefore the main livelihood activities of these populations among which more than 50 % on average, live below

the national poverty line . Agricultural parcels rarely exceed 0.50 ha except the land reserved for agroforestry.

2.1.2. - Intangible Cultural Heritage

Beyond the local *fufuldé* language, intangible cultural heritage of the local population mainly includes songs of griots in a local music much appreciated. Islam is the dominant religion followed by Christianity and traditional African beliefs. Attractions consist of the famous fantasia which takes place during the festive ceremonies, inthronment of lamido etc.

2.2. - Markets and other services

In terms of markets, they are weekly in each canton. Market at the Bogo Garré city take place every Thursday. However, banking services are lacking and there is only one microfinance institution at the Bogo center (*Express Union Money Transfer*). There is no industrial activity. Trade is an ancient activity. It handles the sale of livestock products, distribution of homemade products and manufactured goods.

2.3. - Key stakeholders of Bogo landscape

By virtue of their involvement in the various economic activities, the main actors of the Bogo landscape are farmers, ranchers, fishermen, firewood collectors, herbalists healers, traditional authorities (*Lamido, Lawanes and Djaouros*), administrative authorities, religious authorities and communities (Muslims and Christians), women, elderly and youth groups . All these groups are closely dependent on the landscape and they are direct beneficiaries.

Secondary stakeholders include agricultural CIGs, District delegation of the Ministry of Agriculture and Rural Development (MINADER), the Ministry of Livestock, Fisheries and Animal Industries (MINEPIA), the Institute of Agricultural Research for Development (IRAD), NGOs, CSOs and CBOs that will take care of agricultural knowledge dissemination and technical training of farmers in the projects applications. These partners are important and they support the implementation of the project. They help to mobilize public opinion and to disseminate information; they will collaborate in the management of resources, the monitoring and the follow-up of resource management as well as the development and capacity building of stakeholders.

2.4. - Key issues of the landscape

Different ecosystems in the Bogo landscape, including hydrography, ecosystems and herbaceous pasture, streams and ponds, watersheds, hills and woody species are constrained. There are no conscious protection and management strategies for these resources, even though if the knowledge about the characteristics of those resources and landscape are very good throuh orality. In addition, the governance system to regulate the use of land for agriculture, biodiversity conservation and environmental security do not exist. Environmental safety and recovery of agro pedological and pastoral systems are weak and very slow because of underlying considerations (environmental challenges) and climatic changes that make life difficult and unsustainable.

2.4.1. - Environmental challenges and threats

The main environmental challenges of this landscape can be summarized in five stakes that are all closely related to the climatic conditions for which people are poorly resilient.

Food insecurity linked to climate variability. Low rainfall distribution is coupled with an intensification of droughts over the past three decades (1972-1973 and 1983-1985) with a variability of rainfall up to 40-80 %. These droughts occurring suddenly provoked drying of crops and reduced yields, and therefore superficial crusting driving to the decrease of soil fertility and poverty.

The natural vegetation has disappeared from most of the Bogo cantons. The surface crusting due to old fire practices, the extension of grazing, climatic degradation and erosion are responsible for the degradation of soil quality, the reduced productivity and the loss of biodiversity. Sediment loads of rivers during the rainy season undermine the river bank, gully slopes and destroy the quality of soils and surface waters.

In general, the use of landscape resources is unsustainable. Baseline data show that chemical fertilizers given to people for cotton production are diverted to subsistence agriculture. In addition, river banks, sandbars and valleys of the rivers are cultivated, artisanal fishing is active in streams that dry quickly because the river banks are not afforested. A reduction in soil fertility is found as well as the scarcity and loss of flora and fauna, the increasing of erosion and flooding. The root causes of these identified problems are population growth, lack of hydrological and grassland ecosystems management plans, the total consumption of resources from agriculture, the ignorance of the ecosystems importance, the lack of professional competence and finally the lack of sustainable livelihoods, including lack of credit.

Health is a challenge that can be linked to the low volume of drinking water, drought and the occurrence of extreme weather conditions. People are exposed to water shortages during the dry season. Wells and boreholes do not always provide good water quality. Frequent floods of the rainy season increase the spread of waterborne diseases such as cholera, parasitic infections and cause casualties. In addition, excessive warming temperatures causes the spread of diseases sensitive to weather conditions (endemic malaria, meningitis, measles threatening children from 5-15yrs) and the appearance of parasites such as hookworms and roundworms. Finally, in the health domain, the consequences of drought and heavy rainfall with floods and high winds are:

- High mortality rates (infant, child , maternal and senile) ;
- Low life expectancy at birth;
- Onset of diseases such as acute respiratory infections, malaria, diarrhea, cardiovascular disease, cholera, meningitis, measles, skin diseases and eye diseases.

The fourth environmental challenge is **deforestation**. Population pressure coupled with the increase of arable land leading to land saturation, suggests examining any possibility of recultivation of degraded land.

The final challenge is **the administrative and institutional governance** that arises in terms of control of land and access to basic social services (health, education, water). Thus, institutional capacity to support production and conservation is low.

Ecologically, the production landscape is threatened by the expansion of cultivated areas and pastures, increased erosion (Plate 1 & Appendix 2) not to mention the increase in wasteland (*hardés*). This region, traditionally agricultural and pastoral, is characterized by poor soils outside *karals*.

Plate 1: famous hardés preventing agriculture; expansion of pastures and agricultural intensification which operates up sandbanks within the Mayo Tsanaga River bed despite threats related to erosion.

2.4.2. - Opportunities

The current vegetation results from selection and voluntary reforestation by humans through agroforestry for the exploitation of the fuel wood and traditional medicines. In addition, as an opportunity, very few wildfires are practiced today, except within the *Yaérés*.

Nevertheless, soils found in the region are poor in phosphorus and nitrogen, due to the low organic matter. However, animal manure (cow dung and bird droppings), if exploited rationally would appropriately enrich the soil without chemical fertilizers.

As opportunities, reforestation can be exemplified. Indeed, multidisciplinary studies have attempted to recover production capacity of *hardés*. The latest techniques used seem more successful, it has been implemented through afforestation by Green Sahel Operation launched by the Ministry of Environment and Nature Protection since 2008. It consisted of removing the first 50 cm of the *hardés* (which are battleships) and implementing agroforestry nursery. This afforestation, coupled with the distribution of improved stoves among the local population, solves the problem of fuel wood momentarily in this landscape.

Also, initiatives such as SNV that captures biogas for direct use as an energy source for cooking are welcomed. In addition, reforestation seems to support the restoration of plant and animal biodiversity exposed to threats related to livestock, agriculture etc. Agroforestry can thus help reviving ecosystem services in the landscape and it is also an element of weight in the fight against desertification.

The introduction of crops to fight against malnutrition such as soya bean and *Moringa* is an opportunity, because these plants can be transformed and used appropriately during the dry period, etc.).

3. - COMDEKS Bogo landscape strategies

As part of the baseline assessment and consultation process, Cameroon COMDEKS used a set of indicators for resilience in socio-ecological production landscapes developed by Biodiversity and International University - United Nations - Institute of Advanced Studies (UNU -IAS), in collaboration with UNDP, in order to help measuring and understand the resilience of the target landscapes. These indicators (SEPL) resilience were measured in four interrelated dimensions namely: protection of ecosystems and biodiversity conservation; agricultural biodiversity; knowledge, learning and innovation and finally, social equity and infrastructure.
The baseline was conducted from the SEPL standard questionnaire. Eight cantons participated in various consultations and community audience. The SEPL questionnaire was applied to a total of 330 people including 214 men and 116 women with an average of 28-40 people per canton. Consultation and participatory evaluation were conducted in compliance with social conventions in the region of the Far North Region of Cameroon, namely the men on one side and women on the other. Such a process has allowed efficient, effective and increased participation of women in the planning process and in the implementation of the Strategy. It also released the men who would hardly express themselves if women were present. Thereafter, focus group were held with each Lawan and neighborhood leaders (*Djaouros*) to discuss the problems and challenges of the township and address the changes related to indicators. Finally, we conducted participatory mapping sessions in the townships with populations. At the end of this process within 08 cantons, a community hearing was attended by over 200 people (men, women and children included) to return again and discuss the strategy achievements and difficulties of its implementation at the cantonal level before approval.

Following these consultations and community audience, stakeholders agreed to support a change and participate in the management of natural resources with COMDEKS Program. They are willing to reverse current practices to better manage resources in their territory. However, these good intentions require external support in various forms and the development of implementation plans for effective management.

3.1. - Landscape Perception

After administering the questionnaire to stakeholders, the general synthesis of Figure 3 and Table 1 shows a balance of perception in learning knowledge and innovation, social equity and infrastructure that have standard deviations relatively low (and some divergence in the ecosystems protection and agricultural biodiversity : 0.62 & 0.60).

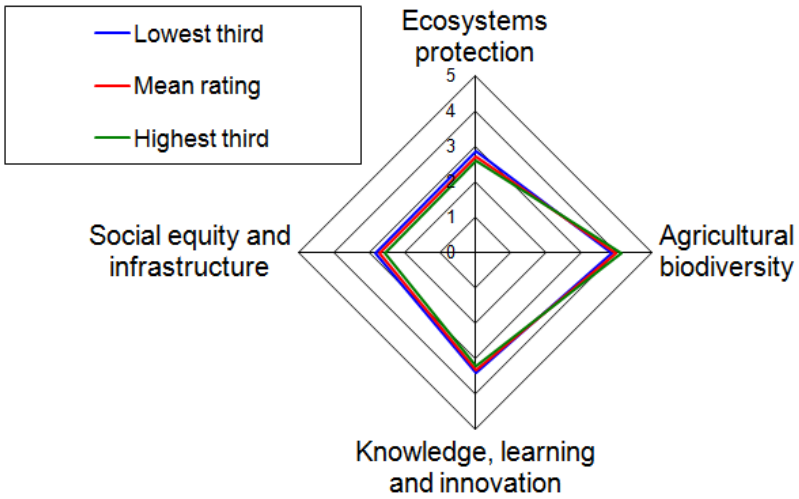

Figure 3: synthetic radar diagram of SEPL performance indicators at Bogo

General synthesis of SEPL at Bogo	Ecosystems protection	Agricultural biodiversity	Knowledge, learning and innovation	Social equity and infrastructure
Lowest third	2,85	3,87	3,41	2,84
Mean rating	2,73	3,98	3,31	2,72
Highest third	2,60	4,11	3,19	2,55
Standard deviation	0,62	0,60	0,45	0,44

Table 1: SEPL performance score synthesis of Bogo landscape (source: GMEM baseline survey, 2013).

This situation is explained by the occurrence of the famine in the transition period between the end of the dry season and the beginning of the rainy season. Certainly, there is diversity in the genetic heritage coupled with the introduction of new varieties adapted to drought. The old system of granary which was previously held only by men, however, has now been abandoned because the number of elderly decreases drastically. Also, populations of the canton and religious denominations have then created community granaries trying to effectively address these shortcomings; but such structures must be generalized, well-managed, enhanced and extended to the whole district. Finally, it is necessary to reduce the use of chemical fertilizers that aggravate land degradation already exposed to water erosion and also contaminate the aquatic environment used for all kinds of needs (dishes, clothes, drinking, bathing, agriculture, beverage of livestock).

Regarding the ecosystems protection, some cantons have recognized a few sacred sites (Mororo, Sedek and Balda) although their number has declined. However, their knowledge of ecosystems is traditional. Trees are protected and maintained by selection because they provide shade and vital resources for human as medicinal plants like the Baobab, neem, shea butter etc.

The struggle for survival and maintenance of all kinds of agricultural biodiversity is a priority. The use of local crop and animal species varieties as well as the consumption of local foods (cereals, vegetables, fruits and wild plants) are preferred. This agricultural biodiversity well preserved in oral tradition (not in written documents) is perfectly transmitted to the younger generations of this region.

The theme of knowledge, learning and innovation is of interest in terms of innovations in agricultural and pastoral sector to improve the resilience of populations. The consensus is real in the absence of institutions that can support the efforts of people outside lawanats and some CIGs. The relatively low standard deviation indicates that institutional development is a priority for all the Bogo cantons.

Finally, the theme of Social equity and infrastructure measures the impact of previous indicators and showed a real consensus in the absence of health infrastructure, roads, schools, markets, water supply and electricity, social facilities and other community facilities for young people in this landscape. This theme everywhere has received the lowest scores. However, the perception has always run the glaring inequalities between men and women known; even though if today, men and society at large recognizes certain rights, some power and wisdom of the women.

Based on the key issues facing the Bogo landscape, the COMDEKS program in Cameroon seek to maintain and revitalize the landscape by promoting sustainable management of land and natural resources. The program's vision is a thriving socio-ecological production landscape where local communities are actively involved in the management and sustainable use of natural resources to increase farming production resources, restore biodiversity and create wealth in order to optimize the ecosystem services. Nevertheless, within these communities, the role and contribution of women in climate resilience must be acknowledged as well as the protection of youth against endemic malaria.

3.2. - Landscape Strategies

The objective is to improve the socio-ecological resilience landscape production (SEPL) through the core of local communities. Six strategy elements are proposed.

S1: The diversification of resources and livelihoods in order to increase welfare by alternative activities and diversification of types of production. For the case of Bogo cantons, one will have vegetables (tomato, eggplant, cucumber, watermelon (*Citrullus lanatus*) , carrots (*Daucus carota*), squash and the diversification of vegetables and fruit trees (mango, guava, orange, lemon, mandarin) through agroforestry. The implementation and diversification of agroforestry products and organic farming without external supply of chemical fertilizers are suitable.

S2 : Conservation of water for all types of needs including agricultural and irrigation needs, drinking and human activities, animal drinking points. It is also useful to keep trees for firewood without forgetting the use of local materials (clay) to implement systematically improved stoves. In this sense, proven methods for collecting rainwater, including watersheds rooftops, the development of micro -watersheds and small earth dams could be a major component of this strategy axis to reduce vulnerability to drought by increasing water supply and improving the carrying capacity of the territory.

S3: The creation and organization of grazing to reduce and avoid conflicts between farmers and herders. Grazing land must be clearly defined including transhumance corridors. Waste collection and feces of animals will be used for organic fertilizer. At the same time, population could convert *hardés* in pasture land or agroforests.

S4: The establishment or strengthening of governance structures and institutions; of social infrastructure and basic facilities (education, health, drinking water, road, electricity including green technologies such as photovoltaics; the sport and recreative activity center for young people) without forgetting microfinance or micro credit facilities.

S5: The advancement and empowerment of women through adult literacy and learning of small trades (crafts, dyeing, soap and oil making with Shea, neem oil and sesame oil extraction, agriculture and transformation of soya bean and *Moringa oleifera* (*guilli gandja* in *Fulfuldé*), sewing, access to micro credit, etc.); provision of micro-credit, but with a priority to the education of girls.

S6: The creation of health CIG in order to fight against malaria through effective distribution of drugs, mosquito nets to populations without forgetting the sensitization of the population, especially young people on their behavior vis-à -vis the environment.

The implementation of this strategy will provide four types of results with their subsequent indicators.

Outcome 1: improve the ecosystems management and protection (wildlife habitat, water, hydrography and watershed ponds) through better management of land and water (water conservation and soil); fight against erosion and fight against desertification, restoration of degraded lands through integrated management. Trees, pastures, soil, water, rivers, and wetlands are managed globally and synergistically protected for better visibility of the landscape.

Indicators R1

- Rate of surfaces and natural ecosystems (herds, water etc.) revitalized and converted
- Water retention, volume of water retained with improved ecosystems and rate of afforestation and fight against erosion.

Outcome 2: Strengthen management of agricultural and pastoral production with agro biodiversity and landscape resilience through good sustainable practices: Promotion of agroforestry, of nursery and multiple staged agriculture, to restore the soil and save landscape integrity. The introduction of hedges around farms to protect crops and increase production will be suitable.

Indicators R2

- Surfaces (ha) where good sustainable practices are applied (hedges and agroforestry) ;
- Number and types of traditional varieties adapted to drought in terms of crops and livestock ;

Outcome 3: Improve the livelihoods quality of life and well-being of social groups through the development of income generating activities and business based on local resources. For example, small business diversification seeds, seed banks, local manufacturing company producing cassava flour and tapioca from cassava tubers, dairies etc.

Indicators R3

- Increased income and household production
- Number and type of alternative sources of income created through diversification of livelihoods.

Outcome 4: Strengthen institutional capacity at the landscape level and integrate the participation of all stakeholders in decision-making in the landscape, especially women and youth. This calls for the establishment, strengthening and implementing structures to secure the health of populations (primary health center, pro-pharmacy, promotion of proven traditional medicine). Finally, enhance the mobilization of women (women's associations and CIGs) and the alphabet learning for adult women without forgetting youth engagement and the creation of agricultural colleges and schools focused on the management of local resources.

Indicators R4

- Number of institutions (participative governance mechanisms covering more than one community) created or strengthened, engaged in integrated landscape management (number of associations established for women and young people , many women and young people involved);

- Number and types of relevant plans and decisions for the target landscape agreed and implemented, and number of the community members and women participating in decision-making.

4. Typology of potential community COMDEKS projects, Cameroon

Possible eligible projects which will contribute to the improvement of landscape connectivity and increasing resilience include: agro-forestry activities and restoration of degraded land, the creation of nurseries, create hedges around crops , restoration and protection of wetlands, ponds, watersheds and associated ecosystem services , conservation of soil and water ; restoration of *hardés*, the establishment of infrastructure for water retention and irrigation. The project will also support the diversification of agricultural and pastoral landscapes by introducing agroforestry and tree management on farms, the establishment of hedgerows around these farms, diversification of production systems through cultivation of a wide variety of plants, crop-livestock integration, trees, agriculture and fishing. Projects of low-input in agriculture, soil conservation and better water management (hedges, mulching, crops cover, collection and storage of rainwater, seasonal crops and crop rotation) will be introduced. Each intervention should have a component on business development of livelihoods based on local needs and taking into account social equity.

4.1. - Typology of potential community based projects to be supported

Community projects must take into account at least 2 of the 4 indicators studied to help communities maintaining and managing landscapes agricultural and pastoral production and improving their resilience. Types of potential projects are as follows.

Project 1 - Ecosystem Protection: Projects aimed at improving the management and protection of ecosystems (wildlife habitat, water, hydro and watershed ponds) to increase connectivity and the resilience of the landscape. These projects will include restoring and protecting the wetlands and watersheds with their associated ecosystem services; effective and efficient management of water and water systems, retention and water conservation through appropriate infrastructure. This type of project may include a component implementation of water harvesting structures (individual wells digging, collecting rainwater, drilling of wells and catchments to collect and use groundwater) for the small-scale irrigation
Eventually, one can therefore check up the rate of surfaces and natural ecosystems (clothes, water etc.) revitalized and converted, then the number of infrastructure of water retention, the volume of water retained with improved ecosystem without forgetting the afforestation rate to fight against erosion.

Project 2 - Agrodiversity. Projects supporting the diversification of agricultural landscapes through agroforestry and tree management on farms , diversification of production systems through the increase in cultivated varieties, multiple staged agriculture to restore the soil and save the integrity of the landscape , as well as crop-livestock integration, trees and agriculture or agriculture - fishery - aquaculture. In this type of project, one must promote farming techniques with low inputs, the multiplication of off season crop varieties, setting up nurseries (with native and exotic species) and hedges around farms for crop protection, increased production and the fight against erosion. This will involve the development of small-scale irrigation related to previous works. Eventually, one can check the number of surfaces ha where sustainable practices are applied (hedges and agroforestry), then the number and types of traditional varieties adapted to drought in terms of plants and livestock.

Project 3: knowledge, learning and innovation. Projects aimed at improving the livelihoods and well -being of social groups through the development of income generating activities and business based on local resources. These projects will focus on the development of small business diversification of seed and seed banks (Create cereal banks, cattle feed bank, wheat, peanut and cottonseed with the support of NGOs, donors and government), local manufacturing company producing cassava flour and tapioca from cassava tubers, dairies etc. These projects will ultimately increase household and communities incomes and one can check the number and type of sources of income put in place.

In principle, the business development of livelihoods that are based on the needs of local population's component must be transversal to all projects.

Project 4 - Social equity and infrastructure projects focused on institutional capacity building and integration of all stakeholders in decision-making on the landscape, especially women and youth. In this type of project, women's groups must be mobilized to raise money and get loans and small loans to finance alternative activities for empowerment. Sensitization and capacity building must be done within disadvantaged people and poor social conditions in the area of consumption and utilization of all water resources (rain, rivers, ponds and lakes) in order to fight against endemic malaria and make resilient communities. In this health component , one can develop traditional medicine around the Neem whose leaves and seeds have many uses and functions (extraction of Neem oil for traditional medicines and manufacture of bio- pesticides, use of sheets (alone or in combination) for the treatment of various diseases such as malaria, amoebas and worms), etc... One can also include the female adult literacy and institutions focused on the management of local resources which certainly would require a contribution from the government or other NGOs.

Hence, the indicators to verify the implementation of the themes will be the number of groups or associations strengthened and engaged in integrated landscape management (number of associations established for women and youth, number of women and young people involved), then the relevant types of plans and decisions for the target landscape agreed and implemented without forgetting the number of community members, including women and youth participating in decision-making.

4.2. - Criteria for selecting communities, CBOs, NGOs and CSOs.

It is imperative that projects to be funded are cross-community grouping two or three cantons. Funding of program activities will be channeled to local communities through non-governmental organizations and community groups (local CIGs). However, GEF SGP must prioritize project selection from CBOs, CSOs and NGOs that have read, understood and completed the SEPL indicators. Non-governmental organizations (NGOs), civil society organizations (CSOs) and community based organizations (CBOs), the CIGs operating in the townships of Bogo and in the Diamaré Division will be preferred and encouraged to apply. It is also urgent to strengthen the capacity of local CIGs grouped in order to help them applying and offering deals after validation of the strategy. The process for the selection, implementation and monitoring of small grant projects will be based on operational guidelines and practices established by the GEF-SGP.

The Proposals to be submitted must absolutely:

- Contribute to the achievement of the vision of the Satoyama Initiative and the Cameroon COMDEKS taking into account at least 2 results and performance indicators identified;
- Strengthen the capacity of recipients to respond and fight against land degradation and desertification; then provide a clear justification of how the proposed activities could contribute to improve sustainable land management in the target landscape ;
- Examine issues of natural resource use in the recognition of the value and importance of local traditions , multi-stakeholder participation and contribution to the socio- economic access to market, trade, in situ processing enterprises and sustainable commercial development of community-based products ;
- Ensure that the focus is on the role of women in natural resource management and decision-making without not forgetting their empowerment and as well as their possible literacy ;

Under these conditions, GEF SGP must specify that participating communities must possess represented and recognized members, then, NGOs, CiGs, CBOs and CSOs must be registered, recognized and legalized. In addition, participating communities must show willingness to contribute to the project cost, in cash or in kind, making the commitment to apply the relevant lessons learned from training and agrees to undertake exchange visits and sharing experience in other localities.

Each project must be received at least one visit a year after receiving the reports. Under COMDEKS and considering the requirements of the landscape, it would be useful to strengthen the capacity of COMDEKS Cameroon NSC and organize it for efficient management of various projects at least three annual meetings on a four month interval. If this is not possible, the NSC should be extended to 01 or 02 members with expertise in landscape issues who will take over.

5.- Monitoring and evaluation plan

The GEF SGP country program in Cameroon will report quarterly to the COMDEKS project management unit on the progress in the implementation of this strategy based on the approval of the project by the GEF -SGP. The progress reports will include gender approach in the description of the results and impacts. They will focus on the achievements, lessons learned, opportunities and best practices.

Cameroon National program landscape level indicators: The SEPL indicators measured at the baseline assessment will be monitored annually. However, a final evaluation of SEPL indicators will take place at a workshop before launching COMDEKS and provides the basis for deliberations on the future country strategy.

Level Project Indicators: Each project will identify the specific landscape strategy outcome to which it is contributing and will monitor the corresponding indicators in the landscape. The results will be updated with progress reports beneficiaries. In addition, each individual project will be funded according to a system of indicators correlated with Bogo SEPL indicators.

Individual grants monitoring and evaluation

The following four steps are applicable to the individual grants monitoring and evaluation.

- ***Ex- ante Visit***: The project management team will engage as much as possible ex ante visits to organizations receiving grants after approval by the National Steering Committee and before the signing of the MOA between the implementing partner and the beneficiary.

- ***Field monitoring visits***: Upon receipt of the first progress report of the beneficiary organizations, each project must be visited at least four times during its implementation period (i.e. once a year). If applicable, each Member of the National Steering Committee with the required skills in technical areas related to the project can join the monitoring team on the ground.
- ***Interim reports or steps***: Grantees must submit sequentially financial and progress reports of the project to the National Steering Committee (NSC). A forecast of resources for the next phase must be submitted by the beneficiary to the NSC as requirements and conditions for the release of the next report. It should also be mandatory the submission of funding proposals in case of emergencies that require immediate and unpredictable financial resources payment.
- ***Final project evaluation report***: beneficiary organizations must submit a final summative report summarizing the profits, gains and lessons learned. The final report should also include the latest financial status of the project.

The strategy will be reviewed each year during the platform meeting of the Advisory Committee to be held between the National Steering Committee of GEF / SGP and members of beneficiary associations of Bogo projects. Changes will be made where necessary to ensure the improvement in the implementation process.

6. - Knowledge Management Plan

The Learning and information sharing aspect constitutes one of the main components of the COMDEKS project. One would expect that each recipient organization contributes to the production and documentation of best practices and lessons learned. Thus, each community is required to allocate a portion of its budget to the production and documentation of specific knowledge that will be developed to summarize the lessons learned from the proposed activities. Types of knowledge products that can be developed directly by the grantee and by the GEF SGP office with support from COMDEKS project coordinator will include:

- COMDEKS Cameroon participates in providing information to the COMDEKS Newsletter which is published four times per year. This quarterly newsletter will be distributed to all stakeholders, including donors;
- Each community project should focus at least 10 % of the budget on tools and production activities of COMDEKS knowledge management (e.g. the development of video and other types of publications at the landscape level);
- Case studies and publications on lessons learned, best practices and new experiences to be shared annually with other COMDEKS members countries. The type of case studies should be determined during the implementation of the project.
- Guidance documents and policy papers
- Brochures and posters
- Study tours for key stakeholders including the media and peer-to-pear exchanges
- Videos and photo stories that are also instruments of information and exchange

Policy influence

The Country COMDEKS program will organize annual roundtable discussion with policy holders and traditional authorities at regional level to share lessons learned from COMDEKS project in Cameroon. The results of the discussions from the roundtable and policy implications will be written into a memorandum to the partner organizations. The program will network with

CSOs, CBOs, NGOs and environmental natural resources management platforms to advocate for relevant changes inspired by the outcomes of the program.

Replication and up-scaling

As part of its practices, the GEF SGP will use the lessons learned from the program to replicate and up-scale COMDEKS good practices from landscape management to support sustainable socio-ecological production activities at the landscape, communities and country levels. At the end of the program, an open day will be organized for all donors, policy makers, the media and other stakeholders to obtain first-hand information on the program results. Best practices will be documented and shared with the government, policy makers, donors and other stakeholders and will serve as a model for other regions.

Appendix 1: some benchmarks of the Bogo socio ecological landscapes Townships.

From top to bottom and left to right, it can be noted: cotton, millet and agroforestry mosaic; fishing in Mayo Tsanaga at Siratare with sorghum on the river bank and sandbanks as well as agroforestry; Tchabawol birds ecological niche; aerial view of some villages of Balda Township, the Hosséré Balda and herd transhumance.






Appendix 2 : threats of erosion and land use

Plate 3b: the threat of erosion within the Mayo Tsanaga course forced the municipal authorities to deflect the bed in order to save the surrounding villages and build a dike to protect the bridge. This dike is now attacked by erosion. Erosion in Balda township at the entry of the lawanat.

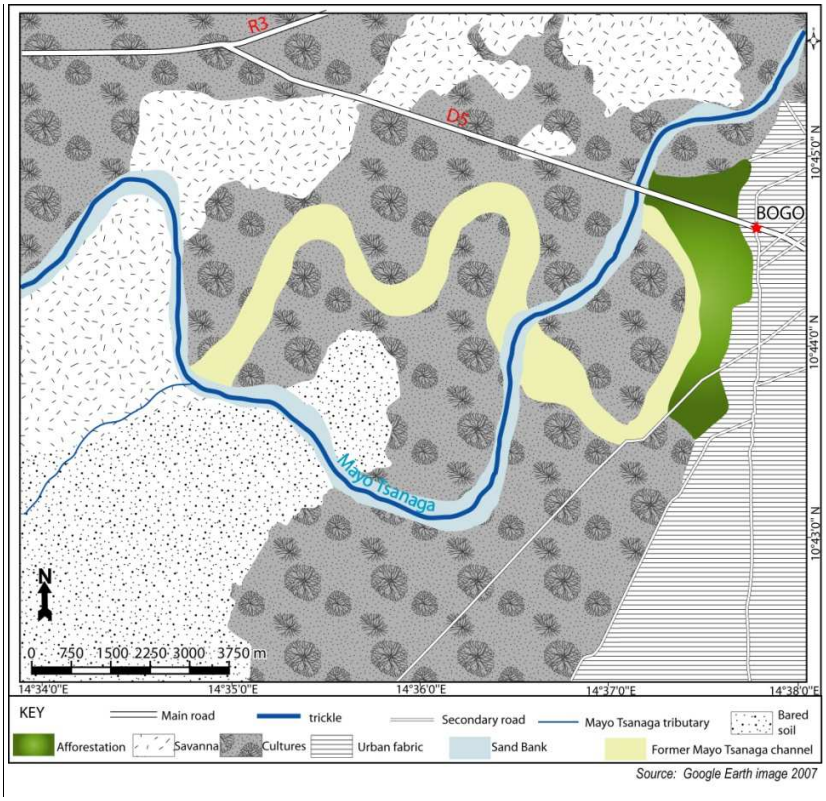

Figure 5: land around the center of the Bogo township. Here one can see the old natural course of Mayo Tsanaga that was diverted to avoid the threat to the village. However, this deviation has not solved the problem and the stream now tends to regain its former bed. These are actions that can threaten the SEPL and further enhance floods. (Source: Google Earth image in 2007, dealt with and taken ARGIS Adobe Illustrator).

Appendix 3: COMDEKS projects planning Matrix.

Objectives / outcomes	Performance indicators	Monitoring means	Activities
Overall objective: a prosperous socio-ecological production landscape where local communities are actively involved in the management and sustainable use of natural resources to increase farming production resources, restore biodiversity, create wealth in order to optimize ecosystem services	• Number of communities and cantons able to meet their basic needs while conserving natural resources. •% increase in community income, and household assets. • Number of persons within the landscape able to innovate and adopt the required changes.	Final Report on the Bogo landscape, Field surveys, sectoral studies Monitoring reports Annual Report	08 projects
Outcome 1: improve the management and ecosystems protection (wildlife habitat, water, hydro and watershed ponds) through better management of land and water (water conservation and soil); fight against erosion and desertification, restoration of degraded lands through integrated management. Trees, pastures, soil, water, rivers, and wetlands are managed globally and synergistically protected for a better visibility of the landscape.	• Rate of surfaces and natural ecosystems (clothes, water etc.) revitalized and converted • Water retention, volume of water retained with improved ecosystems and also rate of afforestation and of fight against erosion.	Annual Report of COMDEKS project Field report Project progress report Monitoring report Scientific publications in journals	02 projects
Outcome 2: strengthen management as well as agricultural and pastoral production with agro biodiversity and landscape resilience through good sustainable practices : promotion of agroforestry, nursery and multiple staged agriculture to restore the soil and save landscape integrity. Introduction of hedges around farms to protect crops and increased production.	• Surfaces in ha where good sustainable practices are applied (hedges and agroforestry); • Number and types of traditional varieties adapted to drought in terms of crops and livestock ;	Annual COMDEKS project Report Observations Field report Project progress report Monitoring and evaluation report	02 projects
Outcome 3: improve the livelihoods and well-being of social groups through the development of income generating activities and business based on local resources. For example, small business diversification seeds, seed banks, local manufacturing company transforming cassava flour and	• Increased income and household production • Number and type of alternative sources of income created through diversification of livelihoods.	Field Report Socio-economic surveys Monitoring and evaluation report Annual COMDEKS project Report Observations	02 projects

tapioca from cassava tubers, dairies etc.			
Outcome 4: Strengthen institutional capacity at the landscape level and integrate the participation of all stakeholders in decision-making on the landscape, especially women and youth. This calls for the establishment, strengthening and implementing structures to secure the populations health (health center, propharmacy , promotion of traditional proven medicine). Finally get the mobilization of women (women's associations and GIC) and learning the alphabet for adult women without forgetting youth engagement, the creation of agricultural colleges and schools focused on the management of local resources.	• Number of institutions (participatory governance mechanisms covering more than one community) created or strengthened, engaged in the integrated landscape management (number of associations established for women and youth, number of women and youth involved) ; • Number and types of relevant plans and decisions for the target landscape agreed and implemented, number of members of the community and women participating in decision-making ;	Field Report Socio-economic surveys Monitoring and evaluation report Annual COMDEKS project Report Observations	02 projects