DEVELOPING BIODIVERSITY INDICATORS AS A TOOL FOR REGULATING DEVELOPMENT ACTIVITIES IN AND AROUND PROTECTED AREAS AND WETLAND REGIONS IN THE NORTH WEST PROVINCE OF CAMEROON

Final Report

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EXECUTIVE SUMMARY

This COMINSUD (Community Initiative for Sustainable Development) project is one of five projects selected under the CBBIA-IAIA Protected Areas Project (PAP). Its aim is to enhance capacities for biodiversity impact assessment, regulation and monitoring in protected areas and wetland regions in the North West Province, using indicators developed by key stakeholders. This region has very rich biodiversity and contains some globally rare and endemic species, according to some projects carried out by Bird Life International in the area. Protected areas in the North West Province were created between 1934 and 1971. However, although more than eight of such areas exist, due to poor management and neglect, they are all seriously degraded.

The overall goal of the project is, therefore, that people in the North West manage protected areas and wetland regions for the benefit of the local communities while maintaining their ecological value in the long term.

The project was implemented between May – December 2005, according to the following five key steps:

1. CBBIA-PAP training and capacity building activities preceding the 25th annual conference of the IAIA.

2. Discussion meetings with key project partners (SNV Highlands, CAMCOF, WHINCONET) to select the areas where activities will take place and to further develop the project's methods.

3. Consultation and awareness meetings with respect to conservation issues on the state and perception of protected areas and wetlands were carried out at six selected sites with different stakeholders. This was followed by a presentation of the findings to Government Departments at provincial level with major interests in these sites.

4. Six community-based workshops were organised in various sites and over 300 people informed of the issues and trained, so that they are better able to respond to conservation issues and use resources sustainably.

5. Production of a user manual with biodiversity indicators, using information generated during the consultation events and community-based workshops.

The project has succeeded in stimulating conservation and sustainable resource use in all the six sites where activities took place. According to the community members in the areas where reserves are found, it was the time that they had discussions with government officials about the reserves. Natural resource management committees were created in the six sites to continue with awareness activities and the development of action plans to enhance conservation efforts and sustainable resource management practices. As a result, municipal councils and village authorities are strongly motivated to continue with the initiatives set in motion and the government's Technical Services are ready to collaborate with them.

This CBBIA-IAIA PAP initiative should be viewed as a rapid measure to deal with current urgent requirements, as well as providing a basis for future action in this fragile ecological region.

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1 BACKGROUND

1.1 THE PROJECT AREA

The North West Province of Cameroon is located in the Western Highlands of Cameroon (see Figure 1.1). It constitutes part of the mountain chains that cover parts of west Cameroon and East Nigeria and includes the remarkable Mt. Oku, which at 3,008m is the second highest peak in West Africa. The region also contains a multitude of forests, springs, rivers, volcanic lakes and a very rich biodiversity. Appendix 2 lists some examples of important species in the region. The total land area of the North West Province is 17,409km^2 about 3.7% of Cameroon's total land surface.

Two distinct seasons make up the climate of this region: a rainy season that runs from mid-March to mid-November and a dry season from mid November to mid-March. The average annual rainfall in the region is 2,000 mm. During the dry season average day temperatures reach up to28^{0}C but are as low as 15^{0}C in the rainy season.

The North West Province consists of several large water catchments; the Bui and the Noun rivers flow into the Sananga in the East, the Donga, Katsina Ala and Menchum rivers flow West to join the Benue in Nigeria, while the Momo River flows into tributaries of the Cross River in Mamfe. Other water bodies include crater lakes (Oku, Nyos, Awing, Bambili, Wum and Befang) and the Bamendjin, which supplies water for hydro-electricity production and also serves as a major fishing ground.

There are numerous plains between the high peaks such as the Ndop the Menchum, the Mbo and Mbaw plains, which receive sediments from the hills and are very fertile.

1.2 SOCIO-ECONOMIC CHARACTERISTICS

The province is divided into seven administrative divisions (Donga-Mantung, Menchum, Boyo, Bui, Momo, Ngoketungia and Mezam) and 31 sub-divisions. It is one of the three zones with the highest population concentration in the country. There were 429,100 inhabitants in 1953, which rose to 1,120,255 inhabitants in 1987 and it is now predicted that there will be two-million inhabitants by 2010 (though the results of the 2005 population census is likely to indicate that the population is already far higher than this).

Agriculture and extractive activities are the main occupations of the population given the fact that this region is generally lacking in manufacturing and processing activities; making it the poorest region in the country. Coffee, the main cash crop over the years, has declined in production since the mid-1980s due to a fall in prices in the world market. According to Cameroon's Millennium Development Goals Progress Report (December 2003), 52.5% of the population in the province live below the poverty line and it is the second poorest province in the country. This figure contrasts with the national average, which is 40.2% and has decreased from 50.5% in 1996.

Figure 1.1 Map of the Northwest Province of Cameroon showing project areas and Wetlands
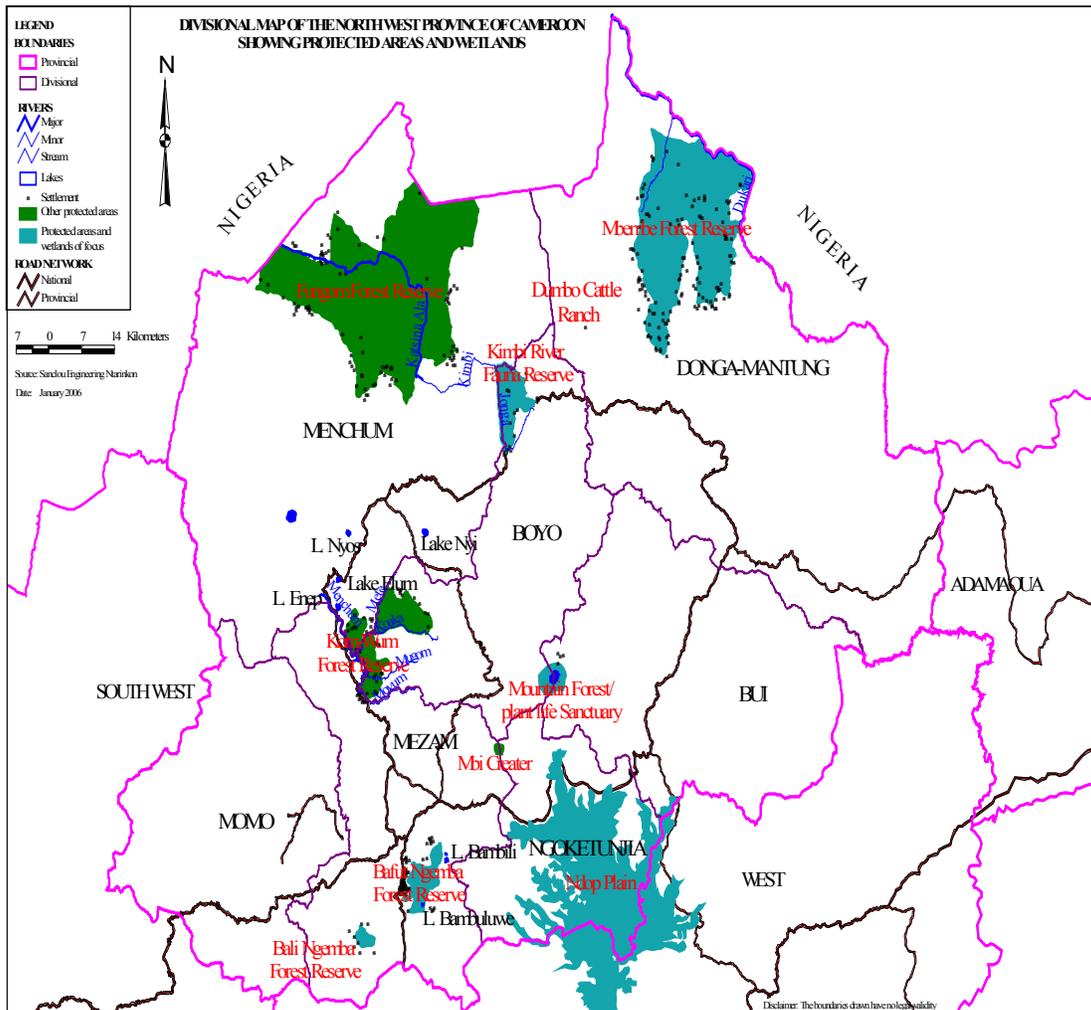
Wetland basins in this region are an important food production area providing over 50% of food resources for the region and a major source of income for different user groups. Continuous and uncontrollable encroachment and over-exploitation of wetland resources due to population growth and the fertility of the land has increased resource pressures and conflicts by upsetting ecological balances and putting biodiversity at risk. Most affected are women who, as a result of cultural factors, have less access to resources and are further exposed to hardship by the depletion of resources on which their livelihoods depend.

Despite the fact that women do much of the work (household and farming) they still suffer the effect of poverty more than men. They lack access and control over productive and social resources and are poorly represented in decision-making in areas affecting their lives at household and community level.

The impact of HIV/AIDS in this region is also very high with an 8.5% prevalence rate as against a national prevalence rate of 5.5% in 2004.

1.3   THE PROBLEMS TO BE TACKLED BY THE PROJECT

The North West Province is an ecological fragile zone that continues to suffer from increasing environmental and biodiversity degradation. The main threats to protected areas and wetlands in this region are:

- Deforestation arising from unsustainable exploitation of forests for fuel wood and timber, and harvesting of non-timber forest products.

- Forest clearing and irrigation for farming and other development projects.

- Bush fires, which are commonly used by hunters in the dry season to obtain game, or by cattle breeders as an easy means of clearing vegetation for regeneration of fresh pasture for their cattle.

- Poverty that has pushed cultivation into wetlands.

- Poor agricultural practices and deforestation, leading to silting of wetlands and alteration of the habitat of certain species.

- Reductions in water levels (by pumping) in wetlands by local inhabitants to facilitate fish catches.

If great attention is not paid to sustainable management practices and conservation efforts particularly in wetland areas the risk of ecological imbalance could be very high as a result of desertification. Threats from different forms of encroachment for agricultural activities, and exploitation of forest and water resources are at the base of biodiversity loss. Communities adjacent to the forests and wetlands are aware of their values and the important resources derived from them but these communities and the responsible departments (NGOs, councils and government services) lack the capacity to achieve effective conservation and sustainable resources management.

Protected areas (reserves) in the North West were created between 1934 and 1971. Although eight protected areas exist in this region unfortunately they have not been given priority in conservation efforts and continue to suffer from different forms of degradation. Apart from the Kimbi Game Reserve, where demarcations of the boundaries of the reserve and erection of new signposts are some recent actions, concrete conservation actions are completely absent. Wetlands ecosystems especially in the woody savannah receive little or no attention. Wetlands in Cameroon have no classification or protection status. The following wetlands are of importance to the project:

- The Ndop plain, which are extensive wetlands and characterised by intensive human activities.

- Lake Bambuluwe (Lake Awing) located in the Bafut – Ngemba Forest Reserve and is classified as an international tourist site. Of equal importance is lake Oku situated in the Mountain/Forest plant life sanctuary and is a site for the rare and globally endangered Bannerman's Turaco (*Tauraco bannermani*).

- Rivers Donga and Kimbi that join to form the river Katsina Ala that flows into Nigeria and is therefore of international importance.

The Government of Cameroon is committed to implementing the Convention on Biodiversity Diversity. Therefore a Ministry of Environment and Forestry was created in 1994 from the Ministry of Agriculture, and subsequently several laws and policies have been enacted in accordance with international conventions related to biodiversity management and conservation. A typical example is the creation of the National Biodiversity Committee following decision No 0002/D/MINEP/CAB/CT1/PF-CBD by the Ministry of Environment and Protection of Nature. The main stakeholders are relevant government services (Provincial Delegations of Agriculture, Environment and Forestry, Livestock and Fishery, Tourism), local

councils, NGOs and community based groups, and those that rely on biodiversity, including farmers, fishermen, hunters, sand excavators, craftsmen, herbalists, and cattle breeders.

2 PROJECT GOAL / OBJECTIVES

The overall goal of the project is to enable people in the North West Province to manage protected areas and wetland regions for the benefit of the local communities while maintaining their ecological value in the long term.

To achieve this, the project's objectives are to ensure that:

- Sufficient capacities for biodiversity impact assessment and monitoring exist for the regulation of activities in the protected areas and wetland regions based on indicators developed by key stakeholders.

- Ten NGOs and three relevant government services increase their capacity to undertake impact assessment and advocate for sustainable management and conservation of protected areas and wetland regions with local communities.

- Biodiversity indicators as tools for regulating development activities in and around protected areas and wetland regions are developed and produced in a user manual.

- A wide public constituency emerges that supports conservation and sustainable resource management in five protected areas and wetland regions, with the backing of the local councils and user groups.

3 APPROACHES AND METHODS

The project was carried out through:

1. **Participatory community mapping**

    In each location participants worked in groups to develop a community map showing different wetland types in their community, the area covered by the reserves in relation to adjacent villages and communities and activities carried out in the reserves.

2. **Stakeholder analysis**

    To effectively understand the activities of all the stakeholders, an analysis of the activities carried out in wetlands and reserves was done with particular focus on those that are threats to biodiversity.

3. **Action plan preparation**

    To enhance community-based management of wetlands and reserves, communities prepared action plans as a step towards biodiversity conservation. The action plans for the communities were drawn up following the threats resulting from the activities of the different actors in the wetland and forest reserves. The following points were considered in the elaboration of each action plan:

    - What are we going to do?

    - Enhancement of community based management of wetlands and forest reserve.

    - Objectives (proposed solution to be implemented).

    - Use of indicators within the user groups.

4. Contact and sensitisation meetings using information collection sheets

Initial contact and awareness meetings were carried out in the six selected sites. During this process information was collected from different stakeholders using questionnaires (see Appendix 3) on:

- Stakeholders and their activities at each selected site.

- Initiatives affecting conservation and sustainable use of resources and control/regulatory measures being undertaken at each site.

- The characteristics of each site.

- The main types of plants, animals and birds species typical of each site.

- The major threats to the sites.

- Priority skill gaps that need to be filled.

- Flagship species at the sites.

- Ecological functions and values of the sites.

4 RESULTS

A summary of the project's achievements is provided in Appendix 4 and photographs of the project area and project activities are included in Appendix 5.

The information collated by the project on each protected area is included in Appendix 6. General indicators identified by the project are listed in Table 4.1 below. Specific indicators for each of the areas and detailed descriptions of each site are given in Appendix 7 with each community action plan.

Table 4.1 Biodiversity indicators developed with different stakeholder

Stakeholders	Main threats to biodiversity	Areas where they are practiced	Target biodiversity resources affected	Consequences on biodiversity	Biodiversity indicators for protected areas and wetlands
Hunters	-Bush burning -Hunting with dogs -Digging -Poisoning - Hunting with guns and spears	-Mbembe forest reserve -Kimbi game reserve -Kilum/Ijim plant sanctuary -Ndop wetlands -Bali-Ngemba forest reserve -Bafut-Ngemba forest reserve	- Small and big game - Snakes and birds -Plants/trees -Soil -Soil organisms like crickets, worms, microbes etc.	- Indiscriminate killing of animals and birds -Destruction of forest and undergrowth by fire and digging -Destruction of animal /bird habitats -Noise from guns and dogs scare animals and birds -Soil organisms are killed and soil structure distorted by bush fire	-Number and type of traps per area - Number of killed animals decreases - Number of same animal species carried by a hunter -Fewer or no fire incidences per year -Decrease in the number of holes made by man on the forest floor - Fewer or no dogs sighted in the reserve or used per hunter -Dense undergrowth -Increase in the

Stakeholders	Main threats to biodiversity	Areas where they are practiced	Target biodiversity resources affected	Consequences on biodiversity	Biodiversity indicators for protected areas and wetlands
					number of wildlife corridors
Farmers	-Clearing of grass -Felling of trees -Burning of grass and soil -Tilling -Chemicals	-Mbembe forest reserve -Ndop wetlands -Bali-Ngemba forest reserve -Bafut-Ngemba forest reserve	-Soil -Grass -Plants/trees -Wildlife -Soil organisms (worms, crickets etc.) -Water	-Indiscriminate cutting down of tree and plant species -Destruction of soil organisms - Erosion of top soil -Destruction of soil texture and structure by fire -Burning of litter on the forest floor leading to infertility -Damage to wetlands -Destruction of animal /bird habitats - Soil and water pollution	-Closed forest canopy -Dense undergrowth -Surface area without trees or scanty number of trees decreases - Surface area burn/Number of fire incidences per year decreases -Number of farmers/frequency of shifting cultivation -Surface area with ridges decreases -Quantity of litter on the forest floor increases -Dark soil colour -Fungi, crickets and worms frequently seen
NTFP Users -Herbalist -Wild fruit and spice harvesters - Honey harvesters -Fuel wood collectors and harvesting	-Harvesting of honey with the use of fire -Felling of trees	-Mbembe forest reserve -kimbi game reserve -Kilum/Ijim plant sanctuary -Ndop wetlands -Bali-Ngemba forest reserve -Bafut-Ngemba forest reserve	-Trees -Herbs -Soil -Bees -Honey -Wild fruits and spices -Mushroom -Soil	- Hives and bees being damaged by fire -Felling of trees by some people -Destruction of trees and grass by fire -Digging of the soil - Impacts on some soil fauna -Uncontrolled harvesting and extinction of some plant species	-Decrease in the number of felled trees -Number of holes created by man on the forest floor decreases -Number of birds and wildlife living on wild fruits increases - Quantity of wild fruits and spices in the market increases -Number of colonised hives in the forest increases -Thick forest undergrowth -Mushroom frequently seen -Number of trees in the forest with ringed barks and dug out roots decreases - Forest canopy becomes dense

Stakeholders	Main threats to biodiversity	Areas where they are practiced	Target biodiversity resources affected	Consequences on biodiversity	Biodiversity indicators for protected areas and wetlands
Fishermen	-Damming -Fishing with chemicals -Digging and draining of wetlands	-Mbembe forest reserve and wetlands -kimbi game reserve -Ndop wetlands	-Water -Fish - Water birds and animal species	-Indiscriminate fish catch -Killing of fishers and other aquatic life using natural and artificial chemicals such as Garmaline, tephrosia and some backs of trees -Scaring of water birds and animals during fishing -Pollution of water bodies with chemicals	-Size of fish caught increases per year -Decrease in the quantity dead fish and other aquatic life -Frequent and regular use of the correct type and sizes of nets and cages -Number of and frequency dams and blockages constructed decreases
Grazers	-Free range grazing -Bush burning -Construction of fences -Chemicals	-Mbembe forest reserve -kimbi game reserve -Kilum/Ijim plant sanctuary -Ndop wetlands -Bali-Ngemba forest reserve -Bafut-Ngemba forest reserve	-Grass -Trees and herbs -Soil -Wildlife species and birds -Water	- Soil Erosion - Soil and water Pollution -Soil Compaction -Destruction of wildlife habitats -Destruction of young and fragile plant and tree species	-Few cattle tracks in the reserve -The frequency of bush fires and areas of the reserve affected by bush fires decreases -Undergrowth remains intact - Absence of cow dung or frequency at which cows are sighted in reserve reduces -Purity of water sources -Decrease in the number of eroded areas in the reserve
	-Promotion of tourism -Planting of alien species -Deforestation	-Mbembe forest reserve -kimbi game reserve -Kilum/Ijim plant sanctuary -Ndop wetlands -Bali-Ngemba forest reserve -Bafut-Ngemba forest	-Trees -Various animal/bird species -Water		-Increase in revenue collected from forest exploitation and tourism -Birds and wildlife number increases -Closed forest canopy -Undergrowth become dense - Boundary of reserve remain intact -Area covered by forest increases -Fewer or no eucalyptus and cypress trees and

Stakeholders	Main threats to biodiversity	Areas where they are practiced	Target biodiversity resources affected	Consequences on biodiversity	Biodiversity indicators for protected areas and wetlands
		forest reserve			other alien species in the reserves
					- Increase in the number of tourists per year

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMMON PROBLEMS OBSERVED IN THE PROTECTED AREAS AND WETLANDS IN THE NORTH WEST

The project found that conservation of biological diversity is weak in all the six areas. Although five of the six areas are protected sites by law, a remarkable decline in biodiversity was noticed and reported during the information collection and awareness process as well as during the community-based workshops. The following reasons account for declines in biological diversity in these areas:

- Absence of a functional management plan that defines the purpose of the protected area, and its management approaches and strategies.

- Insufficient personnel and equipment to undertake conservation activities. The Kimbi Game Reserve which covers 6,000ha has only one conservationist to take care of it, while other sites have only one person as a forestry post officer to serve a whole sub-division.

- Sustainable use of biodiversity components is poorly regulated in most of these sites. There is a very high level of encroachment into the protected areas by different interest groups for settlement, farming, grazing, timber and game exploitation, and collection of non-timber forest resources etc.

- Buffer zones do not exist for some of the protected areas while in others they are poorly managed, e.g. in the Kimbi Game Reserve, buffer zones are extensively burned by herdsmen and serve as grazing areas.

- There is insufficient information of what people should do and what they should not do in protected areas. One interesting aspect that was noticed is that local communities see protected areas as zones of complete prohibition as stipulated by law, yet filled with enormous resources that could provide for their livelihoods. Consequently they seek illegal means to exploit resources from these areas without consideration for sustainability or wise use in the case of wetlands.

- Distribution of benefits from conservation is far from being fair and equitable. User groups and local communities are not in any way involved in the management of protected areas. They do not take part in the decisions as far as management is concerned, nor are allocated particular benefits that result from management.

5.2 RECOMMENDATIONS

- There is a very strong need to develop a functional management plan for all the protected areas that take into consideration CBD Decision VI/7A i.e. an Ecosystem Approach that focuses on people nature interactions and stakeholder involvement. In this process, strengthening local communities to play an active part in the management of

conservation efforts as well as increasing the benefits they may obtain from protected areas is fundamental.

- There is a need to undertake a deeper assessment of the impacts of stakeholder activities in wetlands and protected areas on biodiversity, as a step towards developing management plans for each area.

- There is limited knowledge and information about the actual state of biodiversity in some of the sites (i.e. Bafut-Ngemba, Mbembe and Ndop Wetlands), although some recent work has been done in Kilum/Ijim, Bali Ngemba Forest and Kimbi reserves. Therefore, further capacity building is necessary to undertake species inventories and other biodiversity surveys where information is required to plan conservation efforts.

- In view of the fact that there are eight protected areas in the North West province and many more across the country (as well as many large wetlands), there is a need to develop standards for managing and monitoring protected areas. A review of legislation and procedures for managing protected areas and wetlands should be considered with proper guidelines developed to enhance community participation.

- A study and classification of wetlands should be done and included in the legal system. Management strategies and options for different categories of wetlands should also be developed to ensure wise use of wetlands.

- Assessment of the protected areas should be undertaken to provide a proper valuation of each site to determine management objectives for each site. If they are protected areas then there may be reasons to protect them irrespective of their alternative economic values. Also it should be remembered that it is difficult to value some ecosystem functions properly – e.g. flood storage capacity. Such assessments could also provide guidance on mitigation measures to be taken to reduce or avoid detrimental impacts.

- The creation of Regional Conservation Boards for protected areas and wetlands according to different climatic/ecological zones should be considered as an option for decentralized and efficient management. In this way a highly centralized system could be avoided that provides for too much bureaucracy that is the basis of poor management. If such Regional Conservation Bards are created they should also be provided with autonomous status that will enable them to develop and implement management plans according to national guidelines.

5.3   SOME CHALLENGES FROM COMMUNITY BASED WORKSHOP

A key issue with the workshops has been a lack of knowldege amongst the participants on the issues affecting protected areas. The Lord Mayor of Santa Municipal Council, where the Bafut – Ngemba Forest is located, recognised this and therefore encouraged community participation and the sharing of ideas and the gaining of new knowledge on sensitive issues which had been neglected. He advocated the protection of resources, such as water catchments, for the sake of posterity and appreciated the importance of replacing ignorance with knowledge.

His Royal Highness, Fon Gitang Michael Bongla I of Kimbi also raised further challenges. He pointed out that the community has been deprived of its land for a long time without compensation. They do not benefit from the reserve and local people are not employed to work in it. Furthermore he decried the mismanagement of the reserve's resources and asked COMINSUD to help them to regain their Game Reserve. He also noted that the workshop participants realize the valuable resources found in their communities and stated that the communities in and around Kimbi are willing to learn more from the workshop facilitators.

Through the preparation of community maps of their reserves and protected areas and by identifying and accessing their biodiversity resources, the participants gained a deeper

understanding of the richness of their community. They also realised that biodiversity loss was evident, that some species have disappeared while others have declined considerably. They saw the need to embark on conservation measures and hence the need to develop action plans to support this process as a local initiative for which external assistance can be sort. As a consequence, COMINSUD and other stakeholders interested in the promotion of biodiversity conservation have to continue with the initiated process. This is very evident as the communities lack sufficient capacity to continue the process with the reserves in their current state of neglect.

APPENDIX 1: LIST OF ACRONYMS

CAMCOF: Cameroon Mountain Conservation Foundation

CBD: Conservation of Biological Diversity

CBBIA: Capacity Building in Biodiversity and Impact Assessment

COMINSUD: Community Initiative for Sustainable Development

IAIA: International Association for Impact Assessment

MINEP: Ministry of the Environment and Nature Protection

NGO: Non-Governmental Organisation

PAP: Protected Areas Project

SNV: Dutch Development Organisation

WHINCONET: Western Highlands Nature Conservation Network

APPENDIX 2: SOME EXAMPLES OF IMPORTANT BIODIVERSITY SPECIES

English name	Scientific name
Animals	
Olive baboons	Papio anubis
Black and White colobus	Colobus guereza
Patas monkey	Cercopithecus patas
Green monkey	Cercopithecus tantalus
Mona monkey	Cercopithecus mona
Scrub hare	Lepus saxatilis
Striped ground squirrel	Euxerus erythropus
Red legged sun squirrel	Heliosciurus rufobrachium
African giant squirrel	Protoxerus stangeri
Crested porcupine	Hystrix cristata
Marsh cane rat	Thryonomys gregorianus
Waterbuck	Kobus ellipsiprymnus defassa
Bushbuck	Tragelaphus scriptus
African civet	Civettictis civetta
African buffalo	Syncerus caffer
Slender mongoose	Herpestes sanguinea
Emin's Giant rat	Cricetomys emini
Kob	Kobus kob
Birds	

Cattle Egret	*Bubulcus ibis*
Hamerkop	*Scopus umbretta*
Hadada ibis	*Bostrychia hagedash*
African Black Duck	*Anas sparsa*
Osprey	*Pandion haliaetus*
Black kite	*Milvus migrans*
Palm-nut vulture	*Gypohierax angolensis*
Hooded Vulture	*Necrosytes monachus*
African White-backed vulture	*Gyps africanus*
Crowned Eagle	*Stephanoaetus coronatus*
Red-necked Buzzard	*Buteo auguralis*
Black Sparrowhawk	*Accipter melanoleucus*
Western Banded Snake Eagle	*Circaetus cinerascens*
African Harrier Hawk	*Polyboroides typus*
Green Turaco	*Tauraco persa*
Great blue Turaco	*Corythaeola cristata*
Grey parrot	*Psittacus erithacus*
Red-headed Lovebird	*Agapornis pullarius*
Red-eyed dove	*Streptopelia semitorquata*
African jacana	*Actophilornis africanus*
Double-spurred francoline	*Francolinus bicalcartus*
African wood owl	*Strix woodfordii*
Black Cuckoo	*Cuculus clamosus*
Black bee-eater	*Merops gularis*

APPENDIX 3: INFORMATION QUESTIONNAIRE

Name of personnel_____

Project site_____

Information obtained from_____

   1) Name of site_____

   2) Area covered (average depth of lake)_____

   3) Protection status by law N°_____

   4) A) Government interest on the site

       B) Community interest in the site and their perception of biodiversity

5) Key Actors/Stakeholders in the site

Actors	Their activities	Impact on Biodiversity	Impression of the actors to the situation	Conflicts?
1. Users				
2. Government				
3. NGOs				
4. CBOs				

6) Which of the following initiatives is undertaken at the site

Initiatives	Actors	Main focus and scale	Successes	Difficulties	Suggestions
Conservation					
Sustainable use of Resources					
Control or regulatory					

regulatory measures/activities					

7) What are the characteristics of the site

Elements	Characteristics				
	1	2	3	4	5
▪ Species density; birds, animals, birds and plants					
▪ Homogeneity					
▪ Fragmentation (power lines, settlements, tracks, roads, nature outcomes and others)					
▪ Human activities in the site					
▪ Human settlements (Number of villages/communities)					
▪ Protection status					
▪ Others					

1 – very low, 2. – Low, 3 – average, 4 – high, 5 – very high

8a) Which are the plants, birds and animal species typical of the site?

Name of Species	The Importance	Typical habitat	Present State							What is the main threat?	What is being done?	Is there enough capacity?	Is change visible?
			0	1	2	3	4	5	6				
a) Plants													
b) Birds													
C) Animals													
Fishes/Reptiles													

0 – extinct, 1 – Highly endangered, 2 – Endangered, 3 – Threatened, 4 – Available,

5 – Sufficiently available, 6 – Very abundant

8b) What are the priority threats?

8c) What are the priority skill gaps that need to be filled? (link them with the species in 8a)

8d) What are the flagship species in the site?

9) Ecological functions of the site

Function	Extent				
	1	2	3	4	5
Hydrology					
Water quality					
Wildlife Habitat					
Wildlife corridor					
Plant sanctuary					
Water catchments					
Climate regulator					
Biodiversity					
others					

1 – very low   2 – low 3 – average   4 – high   5 – very high

10) Ecological value

Value	Extent				
	1	2	3	4	5
Economic					
Cultural					
Religious					
Esthetics					
Others					

1 – very low   2 – low 3 – average   4 – high   5 – very high

APPENDIX 4: IMPLEMENTATION AND ACHIEVEMENT OF PROJECT OBJECTIVES

Project output	Activities planned	Results realised
1. A wide public constituency in support of conservation and sustainable resource management emerged in 5 protected areas and wetland regions with the backing of the local councils and user groups.	• Carry out contact and sensitisation meetings in the target communities with various stakeholders • Preparations were made with the councils, users groups and other stakeholders for capacity building workshops at community level	• Information sheets for sensitisation and information collection was produced and used in six (6) protected areas and wetland regions. • The level of awareness of 61 key persons representing different target groups was raised (Government service – 19, Local Council –18, Traditional/village institutions 7, and User groups and community Based Organisations 27). • An assessment of the state of each protected site or wetland was made based on information collection sheets prepared for the purpose. • A strong motivation towards conservation, rehabilitation and enhancement of the various protected areas and wetlands was generated. • A round table reflection meeting was organised on the theme: Management of Wetlands and Protected Areas from a Multi-Stakeholder Perspective. • The reflection meeting attended by 14 persons: 3 from government services of Environment and Tourism, SNV 1, WHINCONET 3, Community Leader 1 and COMINSUD 6. • The major conclusion of the reflection meeting was to seek avenues for enhancement of community participation in managing protected areas and wetlands, in keeping with laid down regulations that will promote conservation efforts and wise use.
10 NGOs and 3 relevant government services increase their impact assessment, advocate for sustainable management and conservation of protected areas and wetland sites with local communities	Organise a capacity building workshop for 25 stakeholders (NGOs, Local Councils, Officials, Relevant Government Services and user groups (12 days workshop)	• Community-based workshops were organised in six sites, 4 of which run for 2 days and two for 1 day. • A total of 300 persons took part in the workshops with an impressive representation and active participation of all stakeholders. • During the workshop extensive sensitisation of conservation need of protected areas and wise use of wetlands was carried out through brainstorming reflection sessions. • The communities were enable to have a better understanding of their wetlands and protected areas through participatory mapping exercises of these areas, identification and determination of the state of wide life and an analysis of the types of activities taking place within. • The various stakeholders and user groups analyse their activities in protected areas and wetlands as well as the threats caused to biodiversity. • The different stakeholder groups developed biodiversity indicators that will serve in regulating their activities in protected areas and wetlands. • The communities in six sites drew-up action plans for the future that will contribute in protecting biodiversity and contribute to the enhancement of their livelihood without threatening biodiversity.

Project output	Activities planned	Results realised
Biodiversity indicators as tools for regulating development activities in and around protected areas and wetland regions are developed and produced in a user manual.	Produce a user manual for protected areas and wetlands regions.	• Local Councils and village traditional institutions showed a very strong commitment to continue the process in future and were very instrumental in organising the workshops in their localities. • Biodiversity indicators were developed during six community-based workshop and summarised into a manual. • 200 copies of the manual were produced and 25 copies distributed to each community where the workshops took place.

APPENDIX 5: PHOTOGRAPHS OF THE PROJECT AREAS AND PROJECT ACTIVITIES

Part of Mbembe Reserve with settlement

Extensive Farming and Grazing activities in Bali – Ngemba and Bafut – Ngemba Reserve, a major threat to the reserves

Part of Natural Forest in Bali – Ngemba Reserve with Dense undergrowth

Exploitation of Eucalyptus an Alien species in Bafut-Ngemba Reserve

Kimbi Game Reserve Signpost- State property

Bush fire- a major threat to protected areas

Raffia exploitation

Ndop Wetlands

Rice field in Ndop -a major wetland activity

Awing Lake-a major touristic attraction in Bafut-Ngemba Forest Reserve

A river crossing the Mbembe Reserve

Water catchment in Bali-Ngemba Reserve

Tectonia gradis plantation created in the Mbembe forest reserve by the government

Participants during training workshop-Kimbi

Group work on Participatory village mapping

Participants presenting group work-community maps

Part of the Facilitation Team involved in Community base workshops

Participants during community based workshops

Ndop

Mbembe

Kimbi

Bafut-Ngemba

APPENDIX 6: SUMMARY OF INFORMATION COLLECTED IN THE COMMUNITIES ON THE SIX PROTECTED AREAS AND WETLANDS

1. **Name of Site**: Kimbi Game Reserve

2. **Location**: Bum Sub- Division, Boyo Division

3. **Area covered**: 6000ha

4. **Protection status**: 150/Bh/KGR/77 (State private property)

5. **Year of creation**: 1971

6. **Description:** It is triangular in shape, borded on both sides by two major rivers (river Kimbi and river Donga. Patches of dense forest, scattered woody savanna and extensive grass cover make up the vegetation type.

7. **Characteristics of the site**

Elements	Characteristics				
	1	2	3	4	5
Diversity in animal, plant and bird species				x	
Fragmentation (power lines, track, road, nature out comes and others).	x				
Human activities in the site	X				
Human settlements (number of villages / committees.	x				
Protection status	X				

1 – Very low,   2 – Low,   3 – Average,   4 – High,   5 – Very high

8. **Analysis of conservation and land use initiative in the site**

Actors involved	Main focus & scale	Successes/ Strength	Difficulties/ Weaknesses	Suggestions
-Government (conservator) -Communities of Kimbi members -Herbalist -Brigade control -Carvers -Hunters	-Protect species like Kaya senegalensis -Protect land, streams, rocks and touristic sites where two rivers meet -Control and minimise illegal exploitation of medicinal plants -Sensitisation of the public on sustainable use of resources -Issue of hunting permits that start from November 31st to May 31st. -Ensure effective protection of game	-There are still available number of plants, birds and mammals species in the reserve -Tourists can visit the area thus bringing revenue to the community -Abundant medicinal plants and water essential for regeneration -There is awareness creation because most people come for hunting permit -People pay penalty for illegal exploitation and sell of timber produce -No sawing of	-The whole community is not involve in the conservation initiatives -Serious reduction in game because poachers from Nigeria and neighbouring villages are damaging the reserve thus making conservation very difficult -Over grazing -Commercial permits have not been executed because of the political state of the country -People bribe the conservator to exploit the reserve	-Active involvement of the community in the reserve -Camps be put inside the reserve to host guards -Burning/grazing should stop -Government should compensate the villages that left the reserve land -The reserve should be managed as stipulated or handed by to the community -Anti poaching committee be set adjacent the community to track illegal hunting -Improve farming system should be introduced -There is need for management plan so as to know the limits of every activity in the reserve -Recalcitrant/illegal exploiters should be

		plank in the reserve for fuel wood -No farming in the reserve		punished persons transporting wood -People should be encourage to plant prunusetc

9. Stakeholder Analysis

Stakeholder	Activities and Interest	Resources	Threats to Wetlands and Protected areas	Indicators or signal
Traditional Authority/ Council	-Fishing camp signal danger -Forest and game R.	-Water dog -Buffalos horns -Tiger skin	/	-Number of horns brought in space -Number of Tiger skin/year
Government/Ministry of Environment	-Patrol /supervision -Fire tracing -Control burning	-Animals -Grass/forest	Complicity to graze/burning	- Increase Number of big games -Diverse habitat for game
Farmers	-No farming in the reserve -Burning outside the reserve	-Food crops	-Burning of the hill and buffer zone. -No direct threat the reserve	-Presence of worms in the soil. -Dark soil colour -Special plant species "Nganga", and "Mbiya" -Mushroom/ cricket seen -Litter thickness on forest floor very high
Grazers	-Grazing	-Grass -Water -Stick -Herbs	-Fight between buffalos and cattle -Burning in the buffer zone and reserve. -Grazing in the reserve during dry. -Noise of cow scare small animals	-Reduction in the number and frequency of fire incidences -Area/portions of the reserve affected by fire decreases -Portions of undergrowth not intact due to fighting between buffalos and cows -The frequency at which cows are sighted in the reserve reduces
Council	-Employment -Revenue -Control and protection	-Animals -Plants -Water	/	-Increase Number of tourist (Visitors book) -Same as government
Hunters	-Catch games -Trapping -Digging	-Games	-Noise of gun shoot	-Number of animals hit by vehicle frequently -Number of games moving out of the reserve/ protected area frequently -Fewer or no dogs sighted in and around the reserve as well as use by hunters for hunting -Number of hunting permit issued by government. -Number of holes in the reserve created by man decreases
Fishermen	-Hooking -Diving	-Fishes -Water	/	-Frequent and regular use of net of appropriate size

				-Regular catch of the recommended size of fish -Increase in the quantity of fish catch per year
Herbalist/NTFP	-Harvesting of medicinal plants -Cutting of tree outside the reserve	-Herbs -Wood	/	-Larger plants like mahogany, iroko etc. -Increase Number of medicinal plant species
Government Ministry of Agriculture	-Training on sustainability -Farming	/	/	/
Schools	-Excursion -Research	/	/	/
Administration Divisional Officer (D.O)	-Authorization and implementation of laws	/	/	/

10. Existing and potential Conflicts in the site

Actors	Reasons
Farmers Vs Graziers	There is no Management Plan for the Reserve and lack of reserve demarcation for each activity
Farmers Vs Hunters	
Indigenes Vs Government	
Individual (Alh Baba Ndanpullo forcefully grazed his cows in the reserve) Vs Goverment	Individuals taking rights in to their hands due to strong financial fist
Fon of Kimbi Vs Government	-The Fon refuse the Government to take lake Oku as part of the reserve because nothing good is being done to the reserve already taken -The reserve does not create employment for the indigenes
CBOs Vs Government	CBOs have discovered that their land taken by the government is being mismanaged and want it back. To them it is no more a protected area

11. List of biodiversity (see examples in Appendix 2)

Animals	As of 2003, 21 mammals have been recorded in the reserve
Birds	220 species of Birds have been identified in the reserve
Plants	98 species of plants have been recorded in the reserve

1. **Name of Site**: Mbembe Forest Reserve

2. **Location:** Ako Sub- Division, Boyo Division

3. **Area covered:** 28,490Ha

4. **Protection status:** Decree N° 50 of 21/07/1934

5. **Year of creation:** 1934

6. **Description:** It is punctuated with settlements such as Buka, Ako town, Abongshie, Akwesse and Ngomo. One main river (River Akong) cuts across the reserve to meet with river Donga that shares boundary with Nigeria. Fragmented dense forest, scattered woody Savanna and extensive grass cover constitute the vegetation type.

7. **Characteristics of the site**

Elements	Characteristics				
	1	2	3	4	5
Diversity in animal, plant and bird species				X	
Homogeneity			X		
Fragmentation (power lines, settlement, track, road, nature out comes and others).			X		
Human activities in the site				X	
Human settlements (number of villages / committees.			X		
Protection status		X			
Others					

1 – Very low,   2 – Low,   3 – Average,   4 – High,   5 – Very high

8. **SWOT analysis of conservation and land use initiative in the site**

Actors involved	Main focus & scale	Successes/ Strength	Difficulties/ Weaknesses	Suggestions
-Government -CBOs -NGOs -Community members -Herbalist -Carvers -Hunters	-Protection of the reserve and Wetlands -Sensitisation of the public on sustainable use of resources -Control and enhance the exploitation of medicinal plants	-Existence of FMIs -Tourists can visit the area thus bringing revenue to the community -Abundant medicinal plants -Demarcation of community forestry -Tectonia grandis plantation is in place -Nursery exist	-Rough nature of terrain -Lack of good projects -Wrong perception by communities and differences in opinion on the need for conservation -Limited number of personnel -Much pressure on resources by the population -Conflicts between different actors	-Active involvement of the community in the reserve -More sensitisation of the communities on the importance of the reserve and the need for protection -Conservation projects be developed -More personnel to enhance the protection of the forest

9. Stakeholder Analysis

Stakeholder	Activities/Interest	Biodiversity Resources affected	Threats to Reserve and Wetlands	Indicators
Hunters	-Trapping -Bush burning -Hunting with dogs -Digging -Poisoning - Hunting with guns and spears	- Small and big wildlife - Snakes and birds -Plants/trees	- Indiscriminate killing of animals and birds -Destruction of forest and undergrowth by fire -Destruction of animal habitat	-Number and type of traps per area - Number of animals decaying in the forest decreases - Number of same animal species carried by a hunter -Fewer or no fire incidence per year -Decrease in the number of holes in the forest floor - Fewer or no dogs sighted in the reserve or per hunter
Farmers	-Clearing -Felling of trees -Burning -Tilling	-Soil -Grass -Plants/trees -Animal species -Soil organisms (worms, crickets etc.)	-Indiscriminate cutting down of tree/plant species -Destruction of soil organisms -Top soil eroded -Destruction of soil texture/structure by fire	-Closed forest canopy -Undergrowth remains intact - Surface area burn and Number of fire incidences per year decrease -Number of farmer and frequency of shifting cultivation -Surface area with Ridges
NTFP Users	-Harvesting of honey - Harvesting of wild fruits and spices	-Trees -Soil -Bees -Honey -Wild fruits and spices	- Hives and bees being damaged by fire -Felling of trees by some people -Eating of fruits by animals -Destruction of trees/grass by fire -Digging of the soil and disturbing/killing some soil organisms	-Increase in the number of hives in the trees and soil in the reserve -Number of holes on the forest floor due to digging for honey decreases -Number of trees with empty hives and signs of fire - Quantity of wild fruits in the market increases
Fishermen	-Nets making -Hooking -Fishing line - Masking/spearing - Fishing with chemicals - Fishing with cage -Casting nets - Dam building - Digging of wetlands -Swimming	-Water -Fish -Various water birds and animal species	- Unusual net sizes - Indiscriminate fish catch/killing using chemicals (Garmaline) and tephrosia, some backs of trees -Scaring of other water birds and animals during fishing -Pollution of water bodies using fishing chemicals	- Size of fish caught -Decrease in the quantity of rotten fish -Frequent use of net and cage of the right type -Number of dams and blockages constructed -Quantity of fish in the market increases per year
Council	- Protection of the forest from wild fire - Protection of forest from illegal exploitation	-Trees -Various animal/bird species		-Increase in revenue collected from forest exploitation and tourism -Birds and wildlife number increases -Closed forest canopy and undergrowth

- Promote Ecotourism			intact
-Biodiversity Resource conservation			-Reserve boundary intact
-Revenue collection			- Increase in the number of tourists per year

10. Existing and potential conflicts in the site

Actors	Reasons
Inter village	There is no Management Plan for the Reserve and lack of reserve demarcation for each activity
Users Vs Users (Farmers Vs Wild Fruit harvesters)	
Users Vs Government	
Government Vs Settlers	-Some settlers do not believe that they are enclosed by the reserve -Some settlers want the government to give part of the reserve as farming land
Government Vs Prominent elites	-The reserve does not create employment for the indigenes
NGO Vs NGO	
NGO Vs Government	
NGO Vs Communities	

11. List of biodiversity

Top 10 species	Density/occurrence	Uses/importance
Animals -Bush pig, Deer, Bush Jackal, Hippopotamus -Rock rabbit, Antelope, Monkey, Stone beef, Cutting grass, Cane rat and Porcupine	Low High	-Food -Source of income -Medicinal -Hide/Skin -Decoration - Cultural value
Birds -King fisher, Water duck, Goose -Swallow, guinea fowl, dove, bush fowl, weaver bird, clock bird, Barnerman Turaco, pigeon, Partridge -"Athadu" (Very dirty bird with tiny leg, long neckflies very slugishly). -"Nwanyiethon" (Small bird always on stone in the river)	High	-Food -Feathers for decoration -Decoration -Timing
Plants -Iroko, Mahogany, Big leaves, Njansang, Vokanga, Indian bamboo, Raffia Bush mango, Bitter cola, Nkooko, Akporo, Pue, Iron wood, Elephant grass -Camwood	High Low	Timber, Food Fuel wood Source of income Medicinal Decoration, carving Construction
Reptiles/Amphibian -Mudfish, Python, Tadpole, Frog, Toad, Monitor lizard, crab, Electric fish, Mud fish Egoana, ngombe, Alligator - Crocodile, Tortoise	High Low	-Food, Income -Medicine - Use for fishing

1. **Name of Site**: Bafut- Ngemba forest reserve

2. **Location:** Santa Sub- Division, Mezam Division

3. **Area covered:** 3238ha

4. **Protection status:** Law No 140 of 1953

5. **Year of creation:** 1953

6. **Description:** it is located within 4 villages: Awing, Akum, Njong and Bamendakwe. The Awing lake which is a touristic site is located within the reserve. The reserve is extensively planted with eucalyptus- an alien species, with very few patches of natural forest.

7. **Characteristics of the site**

Elements	Characteristics				
	1	2	3	4	5
Diversity in animal, plant and bird species				X	
Homogeneity			X		
Fragmentation (power lines, settlement, track, road, nature out comes and others).			X		
Human activities in the site			X		
Human settlements (number of villages / committees.			X		
Protection status		X			
Others					

1 – Very low, 2 – Low, 3 – Average, 4 – High, 5 – Very high

8. **SWOT analysis of conservation and land use initiative in the site**

Actors involved	Main focus & scale	Successes/ Strength	Difficulties/ Weaknesses	Suggestions
-Government -CBOs -NGOs -Community members -Herbalist -Hunters	-Protection of the reserve and Wetlands -Sensitisation of the public on sustainable use of resources	-Tourists can visit the area thus bringing revenue to the community -There are still available number of plants, birds and mammals species in the reserve -People pay penalty for illegal exploitation and sell of timber produce	-Wrong perception by communities and differences in opinion on the need for conservation -Limited number of personnel -Much pressure on resources by the population -Conflicts between different actors	-Active involvement of the community members in conservation activities -More sensitisation of the communities on the importance of the reserve and the need for protection -Conservation projects should be developed -More personnel to enhance the protection of the forest

9. Stakeholder Analysis

Stakeholder	Activities/Interest	Biodiversity Resources affected	Threats Protected areas and Wetlands	Indicators
Council	-Protection of water sheds -Promotes tourism -Inventory of biodiversity resources for conservation	-Trees -Animal species -Birds species -Different types of soil organisms, e.g earth worms, crickets etc.	Unwillingness of users to give up activities in the areas	-Increase number of water shed trees -Absence of Eucalyptus and other alien species -No farming activities in the catchments areas -Vegetation around catchments remains intact -Area covered by forest and plant species increases -Increase in the volume of permanent and seasonal streams -Increasing number of tourists (Visitors book) -Surface area of the lake remains constant
Farmers	Vegetable gardening (wetland) activities such as: -Tilting -Clearing -Drainage of wetland -Food crop production -Clearing with bush fire, herbicide matched,	-Water -Trees -Soils -Earth worms -Termites -Ants -Grass -Snails -Snakes -Small wildlife -Frogs -Crickets Other living organisms	-Pollution -Deforestation -Destruction of habitat of living organisms -Indiscriminate killing of organisms -Destruction of soil structure/texture -Drying up of water bodies	-Decrease in the number of portions of the reserve cultivated -Dark colour of soil -Increase in volume of permanent and seasonal streams -Dense forest canopy -Dense forest undergrowth
Grazers	-Transhumance -Bushfire to improve pasture -Deticking with chemicals	-Grass -Water -Insects -Soil -Other living organisms (snakes, rats, etc)	-Erosion -Pollution -Soil Compaction -Destruction of habitats -Killing of living organisms	- Few cattle tracks in the reserve -Reduction in the number and frequency of bush fires -Areas of the reserve affected by bushfires decreases -Undergrowth remains intact -Absence of cow dung

Hunters	-Trapping -Poisoning -Hunting with Gun and fire -Hunting with Dogs -Digging	-Forest/trees -Small and big wildlife (Squirrels, monkeys etc -Water -Birds -Soil -Soil organisms (crickets, earth worms etc)	-Indiscriminate killing of animals and birds -Pollution of water bodies and the soil -Destruction of soil organisms by digging	-Decrease in the number of traps per area -Number of dead animals decaying due to poisoning decreases -Decrease in the number of holes in the forest created by man -Few or no hunting dogs sighted in the forest -Increase in the number birds and wildlife species
Teachers **Clergy**	Excursions Baptism	 Water	Littering Human waste in water	Presence of trash at site -Bad odour from water

10. Existing and potential Conflicts in the site

Actors	Reasons
Inter village conflicts	Control over farming areas and the lake
Users Vs Users (Graziers Vs Farmers)	No differentiation in farming and grazing areas
Users Vs Government	Firewood harvesters and other users having a communication network to escape from government intervention
Communities Vs Government	-Some government officials exploit the reserve for their personal benefit to the annoyance of the communities who are prohibited from it -Government give out unchecked exploitation permit that enhance over exploitation

11. List of biodiversity

S/n	Birds	Animals	Plants	Reptiles
1.	Bannamam Turaco	Monkey	Pegium	Snakes
2.	Clock bird	Chimpanzee (near Ardo Awing)	Small leave	Lizard
3.	Sun Bird	Antelope	Monkey kola	Frogs and toads
4.	Duck	Cutting grass		Crabs
5.	Bush fowl	Porcupine		
6.	White eagle	Squirrel		
7.	Weaver bird	Bush dog		
8.	Swallow	Rat mole		
9.	King fisher	Rabbits		
10.	Wood picker			
11	Cattle eagle			

1. **Name of Site**: Bali- Ngemba forest reserve

2. **Location:** Santa and Santa Sub- Divisions, Mezam Division

3. **Area covered:** 1147ha

4. **Protection status:** Law No 10 of 1953

5. **Year of creation:** 1953

6. **Description:** It is located in two Subdivisions: Santa and Bali and extensively covered by eucalyptus species

7. **Characteristics of the site**

Elements	Characteristics				
	1	2	3	4	5
Diversity in animal, plant and bird species			X		
Homogeneity				X	
Fragmentation (power lines, settlement, track, road, nature out comes and others).		X			
Human activities in the site			X		
Human settlements (number of villages / committees.			X		
Protection status		X			
Others					

1 – Very low, 2 – Low, 3 – Average, 4 – High, 5 – Very high

8. **SWOT analysis of conservation and land use initiative in the site**

Actors involved	Main focus & scale	Successes/ Strength	Difficulties/weaknesses	Suggestions
-Government -CBOs -NGOs -Community members -Herbalist -Hunters	-Protection of the reserve -Sensitisation of the public on sustainable use of resources	-There are still available number of plants, birds and mammals species in the reserve -People pay penalty for illegal exploitation and sell of timber produce	-Wrong perception by communities and differences in opinion on the need for conservation -Limited number of personnel -Much pressure on resources by the population -Farmers farming in and around the reserve and grazers unwilling to stop their activities in the reserve -Inadequate means and capacity to pursue protective measures	-Active involvement of all actors in conservation activities -More sensitisation of the communities on the importance of the reserve and the need for protection -Conservation projects should be developed -More personnel to enhance the protection of the forest

9. Stakeholder Analysis

Stakeholder	Activities/ Interest	Resources	Threats to Reserve	Indicators
Council	-Control illegal exploitation -Forest regeneration -Promote tourism -Biodiversity resource conservation -Revenue collection	-Trees -Timber -Fuel wood -Various animals and bird species		-Area covered by forest and plants increases -Reduction in the number of Eucalyptus/Cypress trees -Closed forest canopy -Increase revenue collected from forest exploitation and tourism -Reserve boundary is intact
Farmers	-Farming -Cutting down of trees -Clearing with fire -Clearing with chemicals	-Trees -Soil -Various birds and wildlife species -Soil organisms (crickets, worms etc) -Water	-Destroy animal habitat -Deforestation -Distortion of soil structure through ridging/burning leading to erosion. -Pollution and drying up of water sources -Dominance of exotic tree species (Eucalyptus)	-Closed forest canopy -Undergrowth intact -Reserve boundaries intact -Reduction in the volume/discharge of permanent/seasonal streams -Decrease in the number of portions of the reserve affected by bushfire/frequency of bushfire
Grazers	-Graze animals -Burn grass for regeneration	-Trees -Grass -Water -Soil	-Destroy young tree species by eating/breaking them -Destruction of wildlife habitat -Pollute water sources -Cattle create tracks on the forest floor giving way for erosion -Noise from cattle scare smaller wildlife -Destruction of undergrowth	-Frequency at which cows are sighted in the reserve reduces -Number of portions of the reserve affected by fire/Number of fire incidences per year -Dense undergrowth -Reserve boundaries intact -Purity of water sources -Decrease in the number of eroded areas in the reserve
Hunters	-Hunting with guns -Trapping -Burning of grass in reserve -Hunting with dogs -Digging	-Small and big wildlife -Various bird species -Grass -Trees -Soil	-Killing of wildlife and birds -Wildlife habitat destroyed.	-Number and types of traps and snares. -Number of birds and wildlife increases -Prominent wildlife corridors -Fewer or no dogs sighted in the reserve or use per hunter -Number of holes on the forest floor decreases -Number of portions of the reserves affected by fires decreases
NTFP Users -Herbalist -Honey harvesters etc	-Peeling of tree backs -Digging of roots -Collection of leaves seeds and herbs -Use of fire in	-Trees -Herbs -Soil -Bees	-Complete destruction of some plant species -Drying up and dead of fragile tree species	-Number of trees with peeled barks or ring barks decreases -Area of the reserve with trees wilting and drying up as a result of ringing and digging of roots decreases

	harvesting of honey	-Honey	-Killing of bees -Destruction of soil structure and killing of soil organisms by digging	-Number of holes on the forest floor - Number of empty hives tree trunks with signs of fire decreases -Closed forest canopy
Timber exploiters	-Cutting down trees -Transportation of timber	-Trees	-Illegal and uncontrolled exploitation -Opening of tracks -Destruction of young plants -Over exploitation	-Area without trees -Break in canopy -Presence of stumps -Undergrowth not intact -Reduction in birds and wildlife population -Reduction in the length/number of wildlife corridors
Researchers	-Carryout research	Biodiversity resources		
Government services	-Sensitization -Exploitation -Environmental impact assessment -Forest management -Control exploitation -Reforestation -Regeneration	-Trees / biodiversity		-Area covered by forest and plants increases -Reserve boundaries intact -Birds and wildlife population increases -Undergrowth intact -No farming activities in the reserve -Closed forest canopy -Number of wildlife corridors increases

10. Existing and potential conflicts in the site

Actors	Reasons
Users Vs Users (Graziers Vs Farmers)	No differentiation in farming and grazing areas
Users Vs Government	Firewood harvesters and other users having a communication network to escape from government intervention
Communities Vs Government	-Some government officials exploit the reserve for their personal benefit to the annoyance of the communities who are prohibited from it -Government give out unchecked exploitation permit that enhance over exploitation

11. List of biodiversity

Species	Occurrence/ densities	Uses / importance
Animals		
Monkey	Low	Meat (food), pet
Squirrels	High	Meat (food)
Cane rats	Low	Meat
Porcupine	Low	Meat, decoration
Antelope (deer, hare)	Low	Meat, skin for drums
Rat mole	High	Meat
Plants		
Cola nuts	High	Income, food

Mahogany	Low	Timber
Pterigota	Very high	Timber
Albizia (small leaf)	High	Timber
Eucalyptus	High	Timber
Voacanga pygeum	Low	Medicine
Pygeum	Low	Medicine
Birds		
Weaver bird	High	Meat
Bannerman's turacco	High	Decoration
Bush fowls	Average	Meat
Clock bird (francoline)	Very high	Meat
King fisher	Low	Meat
Pintail whydale (long tail)	High	Meat
Wood pecker	Low	Meat
Sun bird	High	Meat
Owl	Average	-
Reptiles		
Viper	Low	Medicine, decoration
Cobra	Low	Food
Green snakes	Average	-
Amphibians		
Frogs	High	
Toads	Low	
Snails	Low	Medicine (shells)

1. **Name of Site**: Ndop Wetlands

2. **Location:** Ngokintunjia Division

3. **Area covered:** 16,717ha

4. **Protection status:** Decree No 70/DF/529 creating UNVDA over Ndop Wetlands

5. **Year of creation:**

6. **Description:** The Ndop Wetland is very extensive covering the entire Ndop plain. It characterised by swamps, rice fields and a dam constructed to provide electricity and for fishing.

7. **Characteristics of the site**

Elements	Characteristics				
	1	2	3	4	5
Diversity in animal, plant and bird species				X	
Homogeneity			X		
Fragmentation (power lines, settlement, track, road, nature out comes and others).			X		
Human activities in the site				X	
Human settlements (number of villages / committees.			X		
Protection status		X			
Others					

1 – Very low,   2 – Low,   3 – Average,   4 – High,   5 – Very high

8. **SWOT analysis of conservation and land use initiative in the site**

Actors involved	Main focus & scale	Successes/strength	Difficulties/weaknesses	Suggestions
-Government -CBOs -NGOs -Community members -Herbalist -Hunters -UNVDA	-Catchment protection -Sensitisation of the public on sustainable use of resources -Sensitisation on proper drainage system -Regeneration of tree species and reforestation -Construction of canals	-There are still available number of plants, birds and mammals species in the reserve -3000 different tree species have been planted -Main actors working in partnership	-Wrong perception by communities and differences in opinion on the need for conservation -Poor nature of roads -Much pressure on resources by the population -Very few people interested in tree planting	-Active involvement of all actors in conservation activities -Set up tree planting programmes -Organise education and sensitisation programmes

9. Stakeholder Analysis

Stake holders	Activities/Interest	Resources	Threats	Indicators
U.N.V.D.A	- Land Development for rice cultivation - Production of infrastructures, Roads, Canals, Dams etc. - Supply farming inputs - Deforestation - Reforestation	- Water - Soil - Land - Trees -Grass/ forest	*- Drainage threaten aquatic life* - Destruction of trees/ grasses - Fuel from tractor pollute water and soil - Compaction of soil by tractors.	- Quantity and species of fish caught - Area of grass/forest increases - Infiltration is easy - Amount of fuel on soil surface reduces
Council	- Collection of waste - Tree planting along streets	- Waste - Ornamental trees	No recycling	No Litter around wetlands
SONEL	-Construction of Dams	Water	- Destruction of raffia, rattan by submersion - Grazing and farming - Floods and damping	- Area of wetlands covered with trees increases
Farmers	- Felling of trees - Bush burning -Tilling - Digging - Use of chemicals	-Water -Soil -Forest -Grass -Animals	-Soil erosion -Soil and water pollution -Reclamation -Deforestation	- Reduced sedimentation of wetlands -Area affected by bush fire reduces -Increase in animal, bird and tree species
Grazers	-Transhumance	- Fresh water -Forest and grass	-Breakage of bunds on rice, fields -Compaction of wetlands	- Soil compaction reduces - Quantity of dunk
NGOs/CBOs	- Education and Sensitization - Training - Support farmers financially and materially	-Trees -Game -Water -Soil		- Increase surface area with environmental friendly tree species - The number of game increases -Prominent dark soil colour -Volume of permanent and seasonal water bodies remain constant or increases
Hunters	- Trapping of birds and Animals - Bush fires	- Birds - Animals -Forest -Grass	- Uncontrolled killing of game -Deforestation	Quantity and species of birds and animals in the market reduces
-Fishermen	- Drainage of Wetlands - Use of chemicals - Fishing with nets - Damming -Fishing with poison	- Fish -Water - Aquatic life	- Pollution of water and soil - Down stream effects - Over fishing with small nets	- Decrease in the quantity of dead and rotten fish -Frequent use of net of the right size
Herbalists	Harvesting and digging of medicinal plants and	-Herbs	- Over exploitation of trees and plant	-Increase number of medicinal plants

	roots	-Trees -Grass	species	medicinal plants -Number of trees with ringed barks reduces
Tourist	- Swimming - Site seeing - Bird watching	-Water -Birds - Animals -Plants		
Student	- Excursion - Research	-Game -All forms of natural resources		
SNEC	- Digging of pipe line	-Water -Soil -Trees -Grass	- Soil Erosion - Cutting down of trees	-Increase in the number of trees

10. List of biodiversity

Species	Species density	Uses/importance
1) Animals		
- Rat mole	High	Food (meat)
- Cane rat	Average	Food (meat)
- Water dog	High	Tradition/meat
- Bush baby	Low	Medicine/meat
- Bush rabbit	Low	Meat
- Monkeys	Low	Meat
- Squerel	High	Meat
- Pocupain (stone beef)	High	Meat
- Antelope	Average	Meat
- Bush deer	Average	Meat
- Fox, Alligator	Low	Meat
2) Birds		
- Water bird	High	Meat
- Bush ducks	High	Meat
- King fisher	Average	
- Palm bird	High	
- Bush fowl	Average	Meat
- Cattle Egret	High	
- Bannaman's Turaco	Low	
- Hawks, kits	Average	
3) Plants		
- Baobab (Bomatree)	Low	Medicine
- Raffia palms	Average	Wine, handicraft
- Palm tree	Average	Oil, handicraft
- Ficus (fig tree)	Low	Boundary, demarcation
- Elephant stocks	High	Pastures fodder

- Peace, Plant (Dracena)	Average	Boundary, tradition
- Gmalina	Average	Fuel wood, timber
- Eucalyptus	High	Poles, fuel wood, timber
Amphibians		Meat
- Snakes	Average	Meat
- Frogs	High	

1. **Name of Site**: Kilum/Ijim plant Sanctuary

2. **Location:** Bui Division

3. **Area covered:**

4. **Protection status:**

5. **Year of creation:**

6. **Characteristics of the site**

Elements	Characteristics				
	1	2	3	4	5
Diversity in animal, plant and bird species			X		
Homogeneity		X			
Fragmentation (power lines, settlement, track, road, nature out comes and others).	X				
Human activities in the site			X		
Human settlements (number of villages / committees.	X				
Protection status		X			
Others					

1 – Very low,　　　　　2 – Low,　　　3 – Average,　4 – High,　　　5 – Very high

7. **SWOT analysis of conservation and land use initiative in the site**

Actors involved	Main focus & scale	Successes/strength	Difficulties/weaknesses	Suggestions
-Government -FMI -NGOs -Community members -Herbalist -Hunters -Traditional authorities	-Sensitisation of the public on sustainable use of resources	-There are still available number of plants, birds and mammals species in the reserve	-Wrong perception by communities and differences in opinion on the need for conservation -Poor nature of roads -Much pressure on resources by the population	-Active involvement of all actors in conservation activities -Organise education and sensitisation programmes

8. Stakeholder Analysis

Actors	Activities/interest	Biodiversity resources	Threats to Plant life sanctuary	Indicators
Grazers	-Free range grazing -Bush Burning -Construction of fences -Night pad- docking	-Grass -Trees -Soil -Water -Wildlife species an birds	-Destruction of plants and animal species -Creation of tracks, channels and passages favouring rill and gully erosion - Destruction of undergrowth	-Fewer or no cattle herds sighted in the sanctuary -Number and Frequency of bush fire incidences per year reduces -Number of fences, huts and paddocks in and around the forest -Decrease number of passages and erosion channels -The thickness of litter on the forest
NTFP harvesters -Bee harvester -Herbalist -Mushroom harvesters -Fuel wood harvesters	**-**Beekeeping (Hives) -Honey harvesting (in the Wild) -Prunus Harvesting -Harvesting of herbs/Medicinal plants -Digging of roots of trees -Mushroom harvesting	**-**Bees -Honey -Trees -Mushrooms -Soil	-Felling of trees -Wilting and felling down of trees as a result of ringing and digging of roots -Killing of bees by fire -Erosion of forest floor and land slide	-Dense undergrowth -Closed forest canopy -The number of felt trees in the forest reduces -The surface area of the forest increases -Mushroom frequently seen -Number of trees in the fore with ringed barks decrease -Quantity of herbs harveste and sighted leaving the fore
Hunters	-Trapping -Hunting with dogs -Hunting with guns/spears -Poisoning -Digging Bush burning	-Small and big gam -Birds -Grass -Trees/Plants -Soil -Soil organisms	-Indiscriminate killing of game -Slowing down of forest regeneration -Destruction of soil structure and fertility -Scaring of animals and birds with the noise of gun and dogs	**-**Number of dead animals decaying in the forest reduces -Fewer or no dogs sighted the forest or with a hunter -Number of traps per area -Quantity of bush meat in th market -The number of wildlife corridors increases

9. List of biodiversity

Species	Density/occurrence	Uses/importance
Animal		
Monkeys	Average	Food/marketing
Rats	High	Food/marketing
Baboons	Threatened	Food/skin
Dykers	Low	Food/skin
Rabbit	High	Food/skin
Rockhyrex	Low	Food
Bush dogs	Low	Food/skin
Birds		
Bannerman Turaco	Average	Tradition/Food/Tourism Food/Tourism
Banded wattle eye	Average	Food/Tourism
Bannarman weaver	High	Food/Tourism
Hill babler	High	Food/Tourism
Sun bird	High	Food/Tourism
Yellow brested bubu	High	Food/Tourism/Medicine
Crown eagle	Low	Food/Tourism
Stone chart	High	Food/Tourism
OWL	Low	Food/Tourism/Marketing
Francolin (bush fowl)	Average	
Trees		
Prunus africnana	High	Medicine/handles/fuelwood
Podocarpus ladifolia	Average	Timber/fuelwood
Noxia congestar	High	Beekeeping/fuel wood
Gnidia glaucis	High	Carving/paper
Sheflera obysilica	High	Carving/fuel wood/beekeeping
Sheflera manie	Average	Carving/fuel wood/beekeeping
Crotton machrastacus	Average	Fuel wood/timber/carving/beekeeping/soil fert improvement
Carapa gladifolia	Average	Fuel wood/Medicine/packaging of rats (Oku sardine)
Alpine bamboo (Indian bamboo)	Average	Construction/fuel wood

APPENDIX 7: COMMUNITY ACTION PLANS

a) Mbembe Forest Reserve

Activities (What)	Resources	When	How	By whom	Indicators
Sensitization of communities on the importance of the reserve and the need to protect it.	Finances for transport, feeding, materials etc	Oct 2005-Jan 2006	-Churches -njangi houses -Information board -Village development association meetings P-T.A	-Natural resource management committee -Council	-Minutes and meetings Number of sensitisation meetings -Letters
Formation of user groups	Didactic materials	Jan-April 2006	Meetings	-Natural resource management committee -Council	List of user groups and members
Development of codes of conduct per user group	Expert	May 2006	-MINFOF -MINEP -MINADER -NGOs		Report of workshop
Development and elaboration of projects	-Materials -Resource fees -Communication	May 2006 ----	Meetings Workshops Research	-Village development associations -Natural resource management committee -Council -NGOs -MINFOF -MINEP	At least 3 projects are funded by 2007

b) Bafut – Ngemba Forest reserve and Wetland (Awing Lake)

Activities (What)	Resources	When	How	By whom	Indicators
Sensitization and awareness raising on the need to protect the reserve	Finances -Experts -Community participation	1 month by Nov. 30th	-Contact key persons and groups. Churches -VDAs, -Poster	-Trainees	-Testimonies -Posters (old) -People know about formation of management committee (NRMC)
Formation of Natural Resource Management Committee s Election of Executives	-Stationeries -Facilitator	By Nov.30th	-General meeting involving all quarter represented	-Trainees Community	-Minutes of meeting -List and signatory of EXCO
Initiation and write projects: a). Protect drinking water sources	-Finances -Experts -Community	By end of 2006	-Meeting -Lobbying and	-NRMC -Council	-At least 2 of the 5 projects are funded

	participation		Advocacy -Contact top influential elites -Publications	-NGOs -VDAs -Teachers -Consultants	
b). Replacement of Eucalyptus and Regeneration of Lake and Reserve c). Improve on touristic sites d). More Training on Natural Resource Management.					

c) Kimbi Game reserve and wetlands

Activities	Resources	When	How	By whom	Indicators
Put in place a functional natural resource management committee	-Hall -Stationeries	8/11/ 2005	General meeting with representation of different villages	-Fon of Kimbi -Mayor of Fonfuka council	-List of number of Natural resource management committee
Sensitization of villagers around the Kimbi game reserve on Natural Resource management	-Stationeries -Report of the workshop on 27-28 oct, 05 -Transportation	January 2006	-Community meetings	-Exco to take the lead -Fon -Mayor -Chief of Forestry -Administration -Churches -Conservator	-Report of village meeting -List of number of persons present at meeting and sensitized.
Negotiate a partnership with the government for collaborative management of the Natural Resource in the reserve	-Expertise -Transport	September 2006	Negotiation and lobbying	-Mayor -Fon to take lead -Parliamentarian -Elites -NR M committee -External experts	-A memorandum of understanding is developed with the government clearly indicating the interest of the community
Develop a management plan for the reserve and the wetland	-Expertise -Transport		-Write proposal to the government and other international organizations for help	-Mayor & conservator to take the lead -Expertise -NGOs	An approved management plan is available
Initiating sustainable livelihood activities for different user groups.	-Hall -Stationeries -Experts -Communication -Transport	November ending 2005	-Meeting -Action	-Leaders of hunters, farmers groups, grazers, fishermen	-All user groups are well organize and start of action collectively.

d) Bali – Ngemba forest reserve

Objectives	Activities	When (time)	How	By whom	Indicators	Resources
Illegal exploitation in the forest reserve is reduced	-Sensitization of neighboring communities	On going From Oct. -----	-Meetings -Churches -Contacts -Markets -Schools	-NRMC -Traditional council -MINFOF -Council	No of sensitization meetings -No of trucks passing -Reduction in council revenue	-Skills -Finances

					-No of impounded illegal trucks from the forest -Increase awareness (attitude survey)	
	Creation of local patrol groups	January 2006	Meeting involving all stakeholders	-Council -NRMC -MINFOF -Traditional authorities	-No of functional local patrol groups -No of reported cases -Follow up of reported cases by authorities	-Human resources -Stationeries -Finances -Hall
	Follow up meetings	October 2006	Through a workshop	-Council -NRMC -MINFOF -Traditional authorities	-Report	-Hall -Finances -Food -Writing materials
The forest cover is regenerated	Identify areas for planting of trees	Latest January 2007	-Field visit	-Council -NRMC -MINFOF -Traditional authorities	-Reports -Maps	Finances for transportation
	Identification of species and establishment of nurseries	Feb – March 2007	-Field visit -Need assessment	-Experts (consultants) -MINFOF -NRMC	-No of nurseries established. -Reports -Observation	-Seeds -Finances
	Planting the identified areas	June – July 2007	-Field work	-Council -NRMC -Community	-Area planted	-Finances
Acquire funds for the execution of action plan	Write project proposal for funding	Latest 2007	-Meeting -Field visit	-Experts (consultants) -NRMC -Council	-Project proposal report.	-Finances

e) Ndop wetlands

N°	ACTIVITIES (what)	RESOURCES	WHEN	HOW	WHO	INDICATOR
1	Production and distribution of workshop report to all stake holders/ participants	- Finances - Reporter	Two weeks	-Typing with pictures -Collection from FAP	COMINSUD	-Signature on distribution sheet
2	Sensitization and Education	- Human - Financial - Material	By May 2006	- Seminars - Meetings	Gov't UNVDA NGO, CBO Traditional Authorities	Two out of 10 household are aware.
3	Celebration of world wetland day.	//	- 2nd Feb 2006	- General Meeting	Gov't, UNVDA FAP and COMINSUD	- Reports

				- Election - Gender		- New items - Publication on Ramsar websites
4	Formation and re-enforcement of Natural Resources management committees	//	July 2006	General Meeting - Election - Gender	- Councils - NGO^s/CBO^s - T.A.	- Report and minutes with list of exco
5	Project Identification and restitution of workshop for some two days in other sub-divisions of Ngoketunjia	//	By end of 2006	- Write proposal - Lobby for funds	UNVDA FAP YEDIA COMINSUD	Workshop
6	Reforestation	//	2006	//	UNVDA, MINEP MINFOF	Report contract
7	Formation of users group union.		//	//	UNVDA, NGO Government	List of member