

**INTERNATIONAL CONFERENCE ON BIODIVERSITY CONSERVATION IN  
TRANSBOUNDARY TROPICAL FORESTS**

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**TRANSBOUNDARY BIODIVERSITY CONSERVATION IN THE  
TRIDOM LANDSCAPE**

**Dr. NGONO Grégoire, PhD  
Director,  
Specialized Research Center on Forest and Environnement(CEREFEN)  
P.O Box 167 Meyomessala-Cameroon  
E-mail: [gregoire.ngono@gmail.com](mailto:gregoire.ngono@gmail.com)**

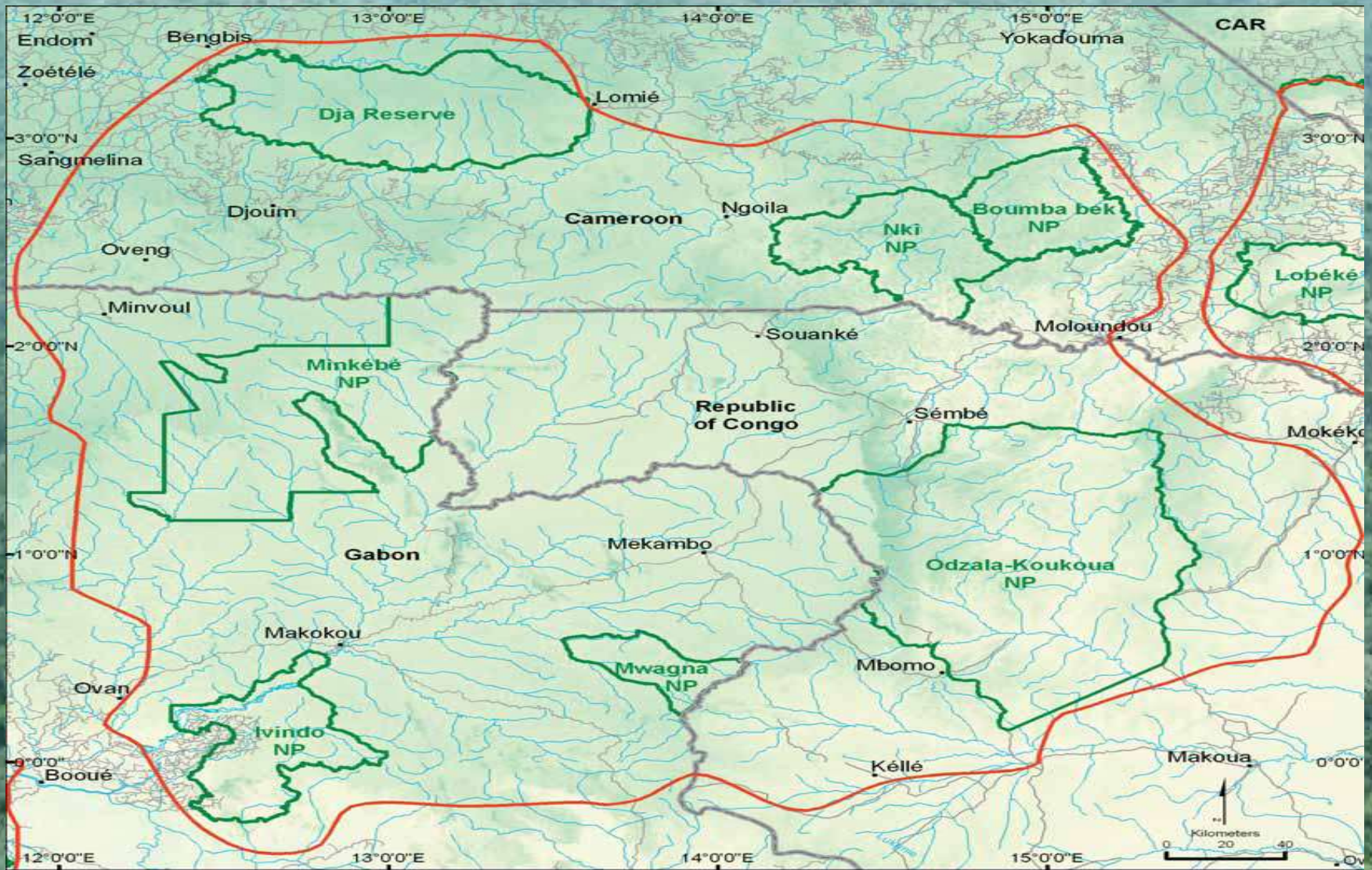
# INTRODUCTION

The "TRIDOM" or Tri-national Dja-Odzala-Minkebe landscape is a zone of about 14.6 million hectares spanning territories in Cameroon, Gabon and Congo, it includes seven protected areas and covers a surface area of 141,000 km<sup>2</sup>, with 35,968 km<sup>2</sup> (24%) encompassed by protected areas and represents 7.5% of the Congo Basin Rainforest already under protection nationally. The Tridom cooperation agreement between the three countries was signed in 2005 and defines the trinational governance structure.

Table 1 : National Protected Areas in TRIDOM

Country	Protected area	Area	Year of creation
Republic of Congo	Odzala-Koukoua National Park	1,250,000 hectares	1935/1999
Gabon	Minkébé National Park	756,700 hectares	1997/2002
	Ivindo National Park	300,274 hectares	1971/202
	Mwagna National Park	116,500 hectares	2002
Cameroon	Boumba-Bek National Park	309,300 hectares	2005
	Nki National Park	238,300 hectares	2005
	Dja Fauna Reserve	526,000 hectares	1950

As depicted in Table 1, existing Protected Areas date back to 1935 and 1950. Those proposed to be included were later either upgraded from Forest and Fauna Reserves to National Parks in 1999, 2002 or created and designated National Parks in 2002 and 2005. All these areas constitute the landscape approach, that is, large scale protection of entire ecosystems through transboundary conservation initiatives.



Map 1 : A locality map of the TRIDOM Landscape

## INTRODUCTION (Cont.)

The Tridom landscape is one of the richest ecoregions in Africa in terms of biodiversity, supporting many species of mammals, including western lowland gorilla and forest elephant, as well as many endemic birds, amphibians, fish, and swallowtail butterflies.

The region also provides food, building materials, handicraft material, medicine, and cultural practices for over 20 million people and plays an important role as a sink and potential source for global emissions of carbon dioxide (CO<sub>2</sub>).

However, the area's globally important biodiversity faces increasingly severe threats which have a number of diverse and interlinked root causes.

In addition, a limited national public sector capacity to plan, oversee, and control natural resource use, as well as the absence of a mechanism for coordinated transboundary activities, is contributing to unsustainable exploitation of natural resources in the landscape.

This results not only in inadequate patrolling and monitoring levels, but also in limited transboundary consultation and collaboration among the management agencies in the three countries.

**Table 2: Summary of the biodiversity threats:**

Direct threats	Indirect threats
<ul style="list-style-type: none"><li>• Forest conversion</li><li>• Unsustainable timber harvesting</li><li>• Unsustainable NTFPs harvesting</li><li>• Wildlife poaching and human-wildlife conflicts</li><li>• Unsustainable fishing</li><li>• Unsustainable village-based hunting</li><li>• Ebola related species die-off</li></ul>	<ul style="list-style-type: none"><li>• Population growth resulting from migration</li><li>• Low agricultural productivity</li><li>• Lack of off-farm livelihood opportunities</li><li>• Inadequate forest resource access and management</li><li>• Cross-border issues</li><li>• Weak government capacity</li><li>• Climate change</li></ul>

As threats are increasing under the exacerbation of logging, hunting, and climate change, it becomes urgent to secure biodiversity conservation and sustainable development in this increasingly vulnerable forest landscape by identifying natural resources management strategies that could lead to the better integration of community needs at local level, and target increased communication and collaboration between decision makers, researchers and natural resource managers across countries.

Finding ways to conserve and protect endangered and threatened plant and wildlife species without compromising the health and welfare of the poor rural families who are almost entirely dependent on this biodiversity is a challenge;

# OBJECTIVE

The main objective of the project was to improve transboundary conservation activities in collaboration with key partners and various institutions in order to reduce pressure on forested area resources in the Tridom landscape .

Specifically it was about adopting a multi-stakeholder approach aimed at contributing to improve biodiversity conservation corridors and forest buffer zone communities' livelihoods with particular reference to innovative agroforestry based incentives

Within a long term context, we assume that :

- \* National development and research institutions, local governments and policy makers at local, national and regional levels can play significant roles in policy development and implementation in order to facilitate transboundary management of biodiversity;

- \* Communities living in and around the Tridom landscape are willing to adopt agricultural, forestry, agroforestry technologies and innovations and market linkage options.

The links between expected outcomes, outputs and road to achievements in the three-national border are depicted in table 2.

**Table 2: Expected outcomes, outputs and road to achievements**

Outcomes	Outputs	Road to achievements
<p><b>Outcome 1:</b> Farmer and forest users' incomes increase.</p>	<p><b>Output 1.1:</b> Improved agriculture, agroforestry and forest technologies disseminated.</p>	<p>The income of farmers and forest users living in the Tridom landscape could be increased by moving agriculture, agroforestry and forest activities from subsistence to marketed oriented and income generating objectives.</p>
<p><b>Outcome 2:</b> Better governance and stronger institutions improve enabling environment for agriculture and forestry</p>	<p><b>Output 2.1:</b> Forest management improved;</p> <p><b>Output 2.2:</b> Improved governance of Community Based Natural Resource Management (CBNRM) groups.</p>	<p>Improved forest management passes through better governance and innovative participatory forest management options .</p> <p>This could be achieved through stakeholders' empowerment process in improved agriculture, agroforests and forests management and governance capacity of CBNRM groups;</p>
<p><b>Outcome 3:</b> Better decision-making with regards to the simultaneous improvement of rural livelihoods and efficient management of biodiversity in the Tridom landscape area.</p>	<p><b>Output 3:</b> Improved strategies and policies for managing transboundary forests and protected areas developed.</p>	<p>Improved strategies and policies would be developed and implemented through various multi stakeholder meetings and policy dialogues .</p>

# RESEARCH METHODOLOGY

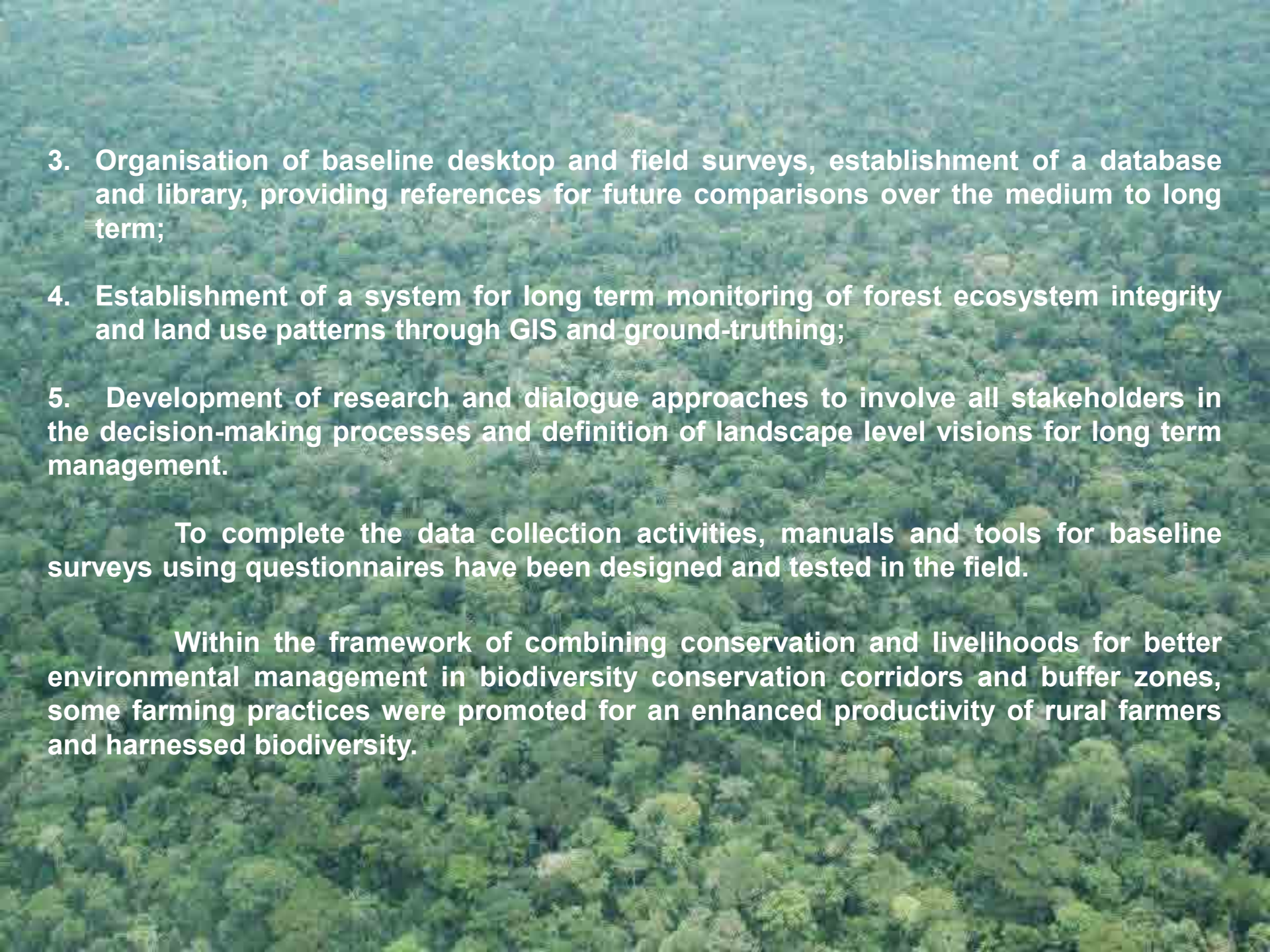
The project was initiated in 2007 by the Specialized Research Centre on Forest and Environment (CEREFEN) in collaboration with the National Forestry Department staff of Cameroon, Gabon, and the Republic of Congo (ROC).

Information for purposes of this research was collected through desk and field studies and stakeholder analysis (SA). A range of rapid participatory diagnosis (RPD) techniques was used,

The operational strategy used combines agroforestry interventions, local knowledge based on traditional values, capacity building in biodiversity surveys and management, and a continuous review of NRM processes to create appropriate incentives for rural communities' participation in forest management activities in the Tridom landscape .

The operational plan involved several measures:

1. Identification of existing community groups that would constitute the entry point for project interventions in the landscape, and a review of their capacity needs for efficient functioning and uptake of best bet NRM practices;
2. Introduction of agricultural and agroforestry innovations to forest fringe communities in order to intensify agriculture outside the forest and provide incentives for communities to adhere to forest management objectives;

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- An aerial photograph of a vast, dense green forest, likely a tropical rainforest, with a thick canopy of trees. The forest extends to the horizon, with some lighter green patches indicating different tree species or forest types.
3. Organisation of baseline desktop and field surveys, establishment of a database and library, providing references for future comparisons over the medium to long term;
  4. Establishment of a system for long term monitoring of forest ecosystem integrity and land use patterns through GIS and ground-truthing;
  5. Development of research and dialogue approaches to involve all stakeholders in the decision-making processes and definition of landscape level visions for long term management.

To complete the data collection activities, manuals and tools for baseline surveys using questionnaires have been designed and tested in the field.

Within the framework of combining conservation and livelihoods for better environmental management in biodiversity conservation corridors and buffer zones, some farming practices were promoted for an enhanced productivity of rural farmers and harnessed biodiversity.

## METHODOLOGY (Cont.)

An inventory of biodiversity in terms of species richness, abundance estimates and ecological importance of the various habitat categorised by the six (excluding farmland) vegetation cover types identified in the biodiversity conservation corridors and the PAs buffer zones was carried out. Ten kilometres of 'Recce' transects were established for assessing wildlife populations within each vegetation type and a variable width 40 m long plot established at one kilometre intervals and;

A study on the understanding of the farming systems and agroforestry practices within the various vegetation types identified was conducted and levels of human pressure on the habitat and on wildlife were assessed.

The key issues in NRM were to develop a mechanism where community livelihoods options could co-exist with and even strengthen the biodiversity conservation in a balanced way. We used smallholder farmers based agricultural innovations and participatory tree domestication to achieve this purpose and assumptions made at the beginning of the project.

Spearman rank correlations were used to investigate the relationship between signs of human disturbance and signs of large mammals.

# RESULTS

Through desk studies, meetings with individuals and institutions, stakeholders of the bushmeat harvesting, processing and marketing activities or simply put, the bushmeat industry, were identified as:

- (a) traditional hunters (groups, individuals);
- (b) rural communities;
- (c) bushmeat traders (buyers, sellers);
- (d) the urban society;
- (e) state agencies charged with wildlife conservation and protection,
- (f) international and national conservation institutions;
- (g) the donor community;
- (h) the logging and mining companies and;
- (i) policy makers.

These stakeholders perform the 5 major functions of production, consumption, supply, management and research support.

The study revealed that biodiversity conservation in the TRIDOM landscape is realized by different stakeholders in three levels :

- \* local level composed of ethnic groups or indigenous populations with socially and culturally oriented values;
- \* national level represented by governments and logging companies with economically oriented values and ;
- \* international level represented by international NGOs, funding agencies, and development programmes with ecologically oriented values.

## RESULTS (Cont.)

The rapid participatory diagnosis (RPD) revealed that:

1. Major livelihood activities included agriculture with plantin, groundnuts, maize and vegetables, hunting and fishing, timber exploitation and NTFP gathering;
2. Constraints to livelihood improvement were loss of soil fertility, low yields from local crop varieties, absence of alternatives to intensive use of forest land and resources hence destructive impact of use on resource base;
3. Forest management was considered by the communities to be the sole responsibility of the forestry officers;
4. Threats to biodiversity were the same accross the three-national border howbeit with varying intensities as a function of accessibility and proximity to urban centres.
5. They were livelihood related such as:
  - \* illegal timber harvesting, farming, and poaching,Governance related such as:
  - \* absence of an efficient resource management structure at grassroots level and;
  - \* consequent inequity in resource use and benefit sharing.

## RESULTS (Cont.)

Information on PAs and natural reserve areas revealed the existence of proposed biodiversity conservation corridors linking the three protected areas :




- \* a cross-border corridor between the protected area of the Dja, Nki, and Minkebe;
- \* a cross-border corridor linking the Minkebe forest with a new protected area in Cameroon (Mengame);
- \* a corridor for conservation between Odzala and the forests of the Djoua and the Ivindo ;
- \* and a conservation corridor linking forest of Minkebe to the forest of the Djoua and the Odzala.

These biodiversity conservation corridors are a physical expression of conservation connectivity and they have three main functions:

- (1) conserving habitat for species movement and for the maintenance of viable populations;
- (2) conserving and enhancing ecosystem services and;
- (3) promoting and enhancing local community welfare through the conservation and use of natural resources.



**Interzone Gabon - Congo - Cameroun**  
**Schéma des zones de corridor potentiel**

-  : Aire protégée existante (ou en cours de création)
-  : Limite indicative de corridor/réserve proposé
-  : Frontière

## RESULTS (Cont.)

Our study discovered that the biodiversity in the proposed corridors extended outside the borders of the protected areas. Protected areas connected by corridors have acquired more species of plants, or higher biodiversity than isolated patches.

Indeed, it is not possible within the current project lifespan to achieve the planned outcomes. However it is possible to highlight some indications of progress towards impact:

- \* Pilot nursery farmers within the landscape regularly receive other villagers and train them on seedling production and management techniques;

- \* Community members who were trained and benefited from other forms of support, were very active during tree planting exercises.

Likewise, nursery activities are changing farmers' income level, and facilitating the implementation of forests management by rendering tree seedlings available for afforestation and reforestation activities. Finally, because communities are involved in monitoring and follow-up of young trees, illegal logging are on the decline.

It is already evident that the most endangered species in the landscape include elephants, chimpanzees, hippopotamus due to disruption of their critical habitats; while some timber species such as *Baillonella Toxisperma*, *Entandrophragma utile*, *E.cylindricum*, *E. angolense* and *E. candollei* are threatened by illegal logging, and deforestation though slash and burn practices.

## RESULTS (Cont.)

More than three hundred types of evidence were found, with a presence index varying between 8 and 10 except for the cane rat (*Tryonomys* sp). For gorilla (*Gorilla gorilla*), chimpanzee (*Pan troglodytes*) and other primate species, the number of evidence varied between 1 and 2.

Although most of the signs of gorilla were in secondary vegetation, signs of this species were also present in agricultural fields, at the savanna border of human settlement. In contrast to gorilla, chimpanzees were widely distributed, occurring in primary forest as well as in secondary vegetation

There was no significant correlation between mining and tree cutting and signs of gorilla; or between mining, agricultural activity and chimpanzee nests; or between chimpanzees other signs and gun shooting.

Surprisingly it was found that the logging and the protected areas had complementary roles in the maintenance of species populations. Many large mammals used different parts of the landscape at different periods of the year and move freely from protected to logged-over areas.

It was revealed that some common game species mainly (*Atherurus africanus*) are resilient to human pressure such as habitat degradation or hunting

# CONCLUSION

The process of adaptation is well underway and the practical elements and activities for implementation of the natural resource management aspects have been tested and proven effective.

Dialogue across border communities and resource managers is effective at grassroots and regional level, and communities are now open to collaboration with the state in preserving biodiversity.

We have learnt that:

- \* It is important to provide the right incentives to farmers around protected areas or threatened ecosystems;

- \* If local people living in and around the three-national borders are granted the right to make resource-related decisions, they will embrace the responsibility to sustain these resources.

- \* Enhanced livelihoods will remove any necessity or justification for beneficiaries to continue with unsustainable or undesirable livelihood practices (e.g., slash and burn, wildlife poaching, illegal lumbering, and trading etc.) to meet family income needs.

- \* The use of conservation corridors between protected areas offers a way of improving connections between habitats and facilitate ecosystem dynamics through the flow of resources and energy and through accommodating the complex interrelated processes of ecological systems.

# RECOMMENDATIONS

Some of the recommendations are made:

- \* Long term investments of donors on transboundary landscape management and research on current challenges including climate change, carbon market mechanisms and payment for ecosystems services schemes to harness forest edge communities' stewardships. By so doing, this could create avenues for natural research management based policy changes with potential to establish a platform for good governance leading to risks reduction for rural communities and deforestation in the region;

- \* The process should seek to empower people to solve problems actively by fostering participation, self-confidence, dialogue, joint decision-making and self-determination in developing a workable national policy and strategy for the sound management of the Tridom's wildlife resources;

- \* International commitments for the conservation of genes, populations, species and assemblages of species or habitats should be reflected in the legal and regulatory frameworks guiding the allocation and use of land for production forestry;

Last but not least, one may highly benefit from stakeholders' traditional or indigenous site-specific knowledge on natural resource management and traditional conservation systems.

# ACKNOWLEDGEMENT

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An aerial photograph of a vast, dense tropical rainforest. The canopy is a rich, textured green, with some taller trees visible as darker spots. The perspective is from a high angle, looking down on the forest floor.

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CONTRIBUTIONS**