CHAPTER 11

Forest zoning experience in Central Africa

*John G. Sidle, **Jef Dupain, *James Beck, ***Janet Nackoney, ‡Carlos de Wasseige, ‡‡Jean Daniel Mendomo Biang, ‡‡‡Robert Leprohon, ‡‡‡Sébastien Malele

*USFS, **AWF, ***UMD, ‡OFAC, ‡‡MINFOF, ‡‡‡MECNT

Introduction to forest zoning and land use planning

Photo 11.1: Forest clearings and fallows in the periphery of Kisangani, DRC

During the last two decades, Central African countries and partners have zoned forests as a part of national and sub-national land use planning. The goal of these efforts is to orient forest development and conservation endeavors to support local, national and international objectives. Land use planning provides the process for informed decisions that balance different, competing and incompatible sectoral interests (e.g., mining, community development, protected areas (PAs), agro-industrial plantations, logging concessions). Such a process requires data gathering and synthesis, significant and ongoing stakeholder consultation at all levels, analyses and projections of development trajectories, informed decisions on trade-offs and conflict resolution, and ultimately political will and local acceptance for lasting success.

In this chapter, we first review the concepts of zoning and land use planning as developed and used in Central Africa. Then we provide an update on the status of zoning and land use planning at the national level. Two case studies of national level experiences highlight earlier work in Cameroon and nascent efforts in Democratic Republic of Congo (DRC). Next we provide an update on zoning and planning at the sub-national level through an examination of Congo Basin Forest Partnership (CBFP) landscapes especially the Maringa-Lopori-Wamba Landscape in the DRC. Finally, we conclude with parting observations and perspectives on zoning.

The purpose of forest zoning and land use planning

Zoning in one form or another has been a major component of land use planning throughout the world. Zoning refers to the designation of permitted or conversely unpermitted uses of land based on mapped zones which separate one set of land uses from another. In principle, zoning consists of identifying the most judicious uses of land given the land's characteristics and the environment. Increasing demands for the earth's resources have compelled nations into even further public policies of land use planning to regulate the use of land and its resources for the well-being of people and their physical, economic and social environment.

Forest zoning constitutes an important stage in the management of Congo Basin forest resources. Indeed, 46 % of the 1.6 million km² of the dense humid African forest has already been allocated for timber concessions or designated as protected areas (PA) and given the current pace of zoning it is likely that most forests in the Congo Basin will be zoned within 20 years (World Resources Institute, 2010; Yanggen *et al.*, 2010). In the past, timber concessions and PAs were zoned with little or no public input, however, modern laws in the Congo Basin require extensive public participation. Moreover, there must be a serious examination of all resources and sector/development needs (e.g., mines, roads, agriculture) in order to form a consensus about land use that is consistent with local, national and international obligations (Beck, 2010). Such an exercise can lead to sound forest zoning and form the basis of land management plans at various levels.

The designation of national parks, national forests, reserves and other large areas (e.g., forest concessions) year after year by national governments, has usually been the product of opportunities and needs rather than the product of a national land use planning process. The concept of a "community forest" or "Community Based Natural Resource Management" area (CBNRM) is recent, although few have performed well in Central Africa or elsewhere in the world. Furthermore, managing CBNRMs and funding communities under established procedures appears problematic at present (Agrawal, 2001; Armitage, 2005; Barrett *et al.*, 2005; Cerutti *et al.*, 2010; Ministry of Forestry and Wildlife, 2009; Minang *et al.*, 2007; Ngniado *et al.*, 2010). In addition, experience from Brazil, Cameroon and Indonesia indicates that zoning CBNRMs does not receive the same attention by governments as zoning for timber concessions and PAs (Hoare, 2006; Topa *et al.*, 2009).

Adding to the complexity of zoning in Central African forests, land tenure (resource rights, access, land titles, etc.) represents a critical element of any land use planning process. Central African traditions and law create a challenging environment with respect to the duality and at times inherent conflict of the modern *vs* customary recognition of land tenure (see box 11.1). Land tenure clarity and security is undeniably a fundamental challenge and ultimate output of a worthwhile land use planning process.

Increasingly, REDD national strategies across the region are highlighting land use planning and land tenure to underpin the region's contributions to global climate change mitigation (Coordination nationale REDD, 2010a & 2010b). Such developments can have lasting positive impacts on society and the natural environment we are dependent on - across many ecosystem services beyond carbon sequestration (see box 11.2).

Photo 11.2: Major villages can rapidly evolve into small cities (Lake Edward, eastern DRC)

Box 11.1: Diagnosis of land management systems

**Alain Karsenty, **Samuel Assembe*

**CIRAD, **CIFOR*

The land tenure situation in Central Africa is characterized by legal duality.

The concept of a **"modern" property regime** is organized around a dual axis:

- Registration, a powerful but very cumbersome device to establish individual private property;
- A fairly general assumption of a "domanial" regime for the remaining land, but with the possibility for individuals to be granted land concessions subject to "enhancement" (of that land).

Assuming a "domanial" regime for forests is the general rule; **classification** (such as in Cameroon, Gabon, CAR, Congo) is the procedure for the legal establishment of the **private domain** (of the State or local public collectivities). In DRC, classification is associated with conservation designation and the private domain is assumed for the remaining forests (with no explicit procedure for its legal incorporation). The **national domain** constitutes a category that is specific to some African countries: it is a category that exists "by default" pending the establishment of alternative land status (individual ownership, private domain…). The national domain is linked to the concept of "collective heritage" rather than ownership: the State is the "keeper" (Cameroon law) and not the owner. However, the inappropriate practices of administration officials sometimes cause confusion between national domain and State ownership.

Although **customary land tenure systems** are extremely diverse, they share common principle: they combine in varying proportions the "individual" and "collective" appropriation, which are usually closely linked; resource extraction is carried out on an individual basis (in fact, on a family basis) while the use of space is completely codified at the collective level. It is important to determine village "finage" or "terroirs" (area used by the village community, whatever the appropriation mode) which can be defined as areas with blurred limits governed by customary rights (irrespective of the means by which they were allocated and the legal status of the land). They are characterized by a definition of village land in reference to places rather than limits, sometimes discontinuous, with variable dimensions, defined by the specific patterns for using resources. The boundaries of these collective spaces are not always known for all areas of the forest and, in sparsely populated areas, some land rights are often largely virtual. Land rights combine with other and different specific rights on resources (e.g., trees, non-timber forest products).

Legal duality (superimposing modern and customary tenures) negatively impacts on maintaining wooded cover. Deforestation is not determined by one particular kind of land tenure: private domain of the State is not synonymous with effective protection by powerless administrations; customary tenures are based on "the law of the axe" (i.e. deforestation) for the recognition of exclusive land rights; experience has shown that communities do not always choose to conserve forests -which they consider belonging to them- if more interesting economic opportunities become available. On the other hand, the lack of clarity and recognition of the different rights being applied and their legitimate users (a direct outcome of legal duality) encourages deforestation. The frequent lack of adjustment between land legislation (favoring land reclamation) and forest legislation generates "security strategies" that are at odds with forest cover. Access to legal forms of land security (such as land concessions for agriculture) is dependent upon enhancement/development, i.e. deforestation. Assuming a "domanial" regime and not recognizing customary patterns of using land and resources opens up the possibility of wooded land being allocated for conversion to other purposes.

Uses of forest lands by indigenous, semi-nomadic forest populations are the less "visible" from a land development perspective: these groups need to maintain **access to resources regardless of the land tenure status**. Concerning the REDD, the development of large scale payment for environmental services would require prior identification of the effective users (with capacity to manage and exclude) of the "finages/terroirs" and the recognition of their real rights to use those spaces and resources.

Clear political vision and orientation are required to allow the land situation in Central Africa to evolve. There is need to strengthen the concept of "property creation from the bottom", which is based on a growing sense of ownership by populations linked to institutional changes (relative democratization process, decentralized taxation, community forests, negotiations to classify forests, preemptive rights ...). Such a policy would seek to recognize the **practical rights** of the different actors. Legislation will need to evolve so that these practical rights are recognized through *ad hoc* juridical instruments which do not necessarily need to stretch to absolute property rights. Essentially, what is required is the recognition of the right to manage and exclude outsiders for families, clans and communities.

It would not be appropriate to seek to establish property rights on "environmental services" and especially over carbon. Environmental services are by their very nature collective (or public) goods. They consist of activities (such as the upkeep of the countryside, water quality maintenance, and the reduction of deforestation) that are undertaken by humans for other humans, about the environment. **The real question is one of the ownership of "carbon credits"** which could be offered in exchange for an active contribution to the sequestration of atmospheric CO_2 (by planting) or for maintaining carbon levels on a given land (by avoiding deforestation). In other words, those agents who effectively provide the environmental service have the rights to receive carbon credits (or financial reward) rather than the "owners".

The study conducted by the authors in 2010 and relating to land management in Central Africa makes six proposals:

1. **Revise the concept of "improvement/development/enhancement"** in land tenure laws/codes to one of "active contribution to sustainable development and environmental conservation";

2. Seek to **achieve greater coherence and continuity in land use and forest laws** by lifting the various legal and regulatory barriers that prevent communities from obtaining land concessions in wooded areas, and ownership of natural or planted forests contained in those areas, if they do not convert them for agricultural purposes;

3. **In each country, identify and map out the customary territories** (rural zones/limits - terroirs or finages) **and then identify and register the multiple rights** exercised over those spaces **by the various stakeholder groups/actors** that are using them. Tools such as participatory land mapping for the zones/limits (terroirs/finages) could be used in order to achieve this. The information found could be used in zoning plans and, in the context of sustainable forest management, to share the benefits of exploitation. This work could be undertaken by administrations, delegated to local authorities or civil society using a set of specifications detailing the methods to be employed and the categories to be used (which could be prepared by COMIFAC);

4. **Each country should organize its community forestry around two spaces:**
   - An exclusive space set up as a collective forest or land concession, as part of a wider non-exclusive area;
   - A non-exclusive space, defined by maps drawn up with the communities and their neighbors. This space could have accurate limits (where streams, ridge lines ... exist) or vague limits (grey areas, especially when some resources are shared with neighboring communities).

   Policy, legislative and regulatory documents should explicitly recognize these superimposed rights and the need to manage them jointly in a coordinated way;

5. In order to establish rule of law, countries that currently do so, should **abandon the practice of assuming private forest domaniality.** This does not mean that the State cannot become a forest owner, but that the constitution of the private domain of the State should be carried out in accordance with the proper legal principles and appropriate procedures. This may be called "registration", "classification", or given other designations;

6. It would appear essential that the COMIFAC countries that have not yet done so, should introduce the **concept of a "permanent forest estate"** in their respective forest and land codes. The identification of a permanent forest estate seeking to ensure the long-term maintenance of land under forest cover should be **the primary goal of zoning plans.** Proposals for land allocation that are too detailed and likely to generate conflict should be excluded. Establishing a legal distinction between "permanent forests" (or permanent forest estates) and "non-permanent forests" will set the limits for the respective use of enforceable regulation (logic "command and control") and of economic instruments that could be developed under the REDD.

Box 11.2: Reducing Emissions from Deforestation and Forest Degradation (REDD)

REDD is a climate change mitigation strategy that offers developing countries incentives to reduce their forest carbon emissions. REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. REDD+ brings a new dimension to forest management and forest zoning (Kasulu Seya Makongai *et al.*, 2009). DRC is developing several proposals to build the structural conditions of a large scale and operational deployment of REDD+ (Coordination nationale REDD, 2010a-f). Vast tracts of forest could be zoned as "classified forests" for REDD+ reserves, but it is likely that REDD+ will intervene largely at the forest management level through sustainable forestry practices that better manage carbon: narrower roads, reduced impact logging and other improved standards for forest exploitation (Ndikumagenge, 2010). There may be forest concessions for the production of environmental services (Brummett *et al.*, 2009; Lescuyer *et al.*, 2009b). DRC estimates that $ 500 million are required for the first two years of REDD+ and over $ 5 billion for the following 5-15 years, amounts seen in recent REDD+ agreements in Indonesia. There are also dramatic lessons of corruption and mismanagement in Indonesia (Clement *et al.*, 2010) that are likely to occur in DRC.

Forest zoning must be integrated into the vast national land use planning process envisioned by REDD+ in DRC (MECNT, 2009b; Coordination nationale REDD, 2010b). Because forest zoning is already underway by the CNPZF, DRC policies, CARPE landscapes, USFS assistance and a World Bank funded forest zoning consultant, forest zoning can greatly assist REDD+ in DRC.

Overview of concepts and working definitions

Previously, there has been significant confusion and arguably misunderstanding of some basic terms and concepts pertinent to land use planning and zoning. Therefore, a common definition of terms and concepts is critical to effective and efficient communication in land use planning and zoning. The following terms are defined here to clarify the authors' working perspective (USFS, 2010a):

- **Land use Plan**: a plan that determines the stratification of land uses within a landscape, and provides basic guidance for each land use zone and the integration of these zones;
- **Planning**: process in which stakeholders (e.g., community members, scientists, government representatives, private businesses, traditional authorities) come together to discuss and determine how to manage resources in a particular geographic area for the benefit of current and future generations;
- **Zoning**: process of identifying (or delineating) geographic areas separated by differing land uses (and associated guidelines) as a part of a broader land use planning process;
- **Macro-zone**: a large geographic area such as a national park or forest concession;
- **Micro-zone**: spatially explicit area within a macro-zone where land management differs from adjoining micro-zones.

Existing macro-zones are often micro-zoned into different land uses during the development of management plans. For example, Lobéké National Park in Cameroon has been micro-zoned into areas specially devoted to fishing or local non-timber forest product gathering (Usongo & Nzooh Dongmo, 2010), and the Okapi Faunal Reserve in DRC has been divided into micro-zones devoted to agriculture, hunting and conservation (Brown, 2010). Moreover, timber concessions in Republic of Congo and most countries in the sub-region contain numerous micro-zones for multiple-use objectives such as timber production, conservation, or other micro-zones (Elkan *et al.*, 2006; Poulsen *et al.*, 2010).

Public participation at the local level – Macro-zoning and micro-zoning

Central to forest zoning is the participation of local people who have inhabited the forests for hundreds of years and who depend upon the forests for their livelihoods. In the recent past (and ongoing in some cases), central governments often have entered into agreements with timber companies, mining companies, as well as designated protected areas without the input from local communities. As a result, many people were expelled from their forests. Today, however, for the most part, extensive engagement by local people is required by law and various socio-economic and ecological studies must be undertaken. For example, DRC law requires public involvement, a detailed description and justification for a proposed protected area, and precise mapping of boundaries[65]. Future forests of permanent production, timber concessions, PA, CBNRMs, or other uses that fundamentally change the land cover (mining and agriculture) must be built upon a strong foundation of public involvement.

Macro-zoning requires the involvement of several national-level government ministries (including governmental representatives of agriculture, forest, mining and land use) and well-recognized representatives of minorities, civil society, and the private sector, to name a few. Micro-zoning, however, requires the active participation of representatives of the local communities who depend on the land for their livelihoods as well as the participation of other stakeholders such as the private sector (including logging or mining companies).

The debate continues across the region about the ideal, appropriate, and/or feasible level of public participation during different levels of land use planning and forest zoning. For example, the Ministry of the Environment, Conservation of Nature, and Tourism (MECNT) in DRC is promoting a forest zoning approach that first focuses on macro-zoning in which biophysical, social and economic data are gathered, and community representatives are consulted to develop indicative "proposed" macro-zoning maps. Generally speaking, when actual "decisions" are to be made during the classification processes, more detailed and finer scale participatory mapping will be critical for overall macro-zone borders and micro-zoning. Some contend that micro-zoning should occur before any national/provincial macro-zoning occurs because macro-zoning can result in a *"fait accompli"* by the time the process arrives at the classification stage.

Photo 11.3: Dialogue and consultation efforts between local populations and a logging company

[65]Decree n° 08/08 (8 April 2008), establishing the procedure to classify and unclassify forests. Standards for Forest Zoning: an operational guide. Ministry of the Environment, Conservation of Nature, and Tourism (MECNT). Forest Inventory and Management Division, Kinshasa, DRC.

There are many examples of public participatory processes in Central Africa[66]. In general, these approaches take community needs and desires into account to facilitate land use planning activities. The mechanisms for equitably bringing the interests of all stakeholders into the zoning process for the establishment of PA, community development areas, timber concessions and other extractive resource zones (ERZ) is critical to the success of zoning. Developing mechanisms to give key stakeholder representatives a voice in the zoning process is essential. As noted above, villages may end up with "default zoning" whereby various interests identify and establish PA and timber concessions first, leaving villages with the use of remaining forests. Mining permits, timber concessions, and PA may overlap village lands if the latter are not sufficiently taken into account during, for example, participatory mapping with villagers.

Ideally, extensive on-the-ground work is necessary for adequate community participation given the growing rate of land use change associated with population growth, immigration and informal sector expansion (e.g. agriculture, mining), even in the most remote forests. For example, Hart (2010) found that in eastern DRC forests, participation is not only being in villages and talking about a forest over a map but actually travelling through the forest with local people. The time spent with a community engaging in participatory mapping (usually one year or more) garners the most important input for sound zoning proposals, in this case, a proposed 30,000 km^2 classified forest between the Tshuapa, Lomami and Lualaba rivers (Hart, 2010). Ideally, multi-year participatory mapping and local engagement should occur. However, land use planning resources are often insufficient and national, regional, and international drivers push for quick zoning of palm oil plantations, timber and mining concessions. A less than ideal, though wise and practical choice, may be a high level macro-zoning followed by targeted micro-zoning.

Photo 11.4: The understanding and the marking of limits is central to the success of zoning efforts

Across Central Africa, most villagers have little geographic knowledge outside their community limits and integrating such knowledge into an institutional context is challenging. However, local input and standard indices of human activities and biodiversity can calibrate statements about the forest and its use with similar measurements throughout a landscape of diverse people whose opinions vary as to authority over natural resources and the status of wildlife, fisheries, and other natural resources. Claims for land and resources at the territorial, sector, group and other levels often need to be verified. Hence, zoning proposals must be carried out in a dynamic manner.

[66]See, for example: http://carpe.umd.edu
www.satyadi.com

Status at the national level

COMIFAC member countries have different requirements and visions pertaining to land use planning and zoning because they have different experiences and levels of development in this domain. Table 11.1 synthesizes the pertinent information on that status of national level land use planning processes and forest zoning processes across the COMIFAC member countries (COMIFAC, 2011). The following sections discuss case studies in Cameroon and DRC.

Case study: Cameroon

In Cameroon, planning for the use of forested land which has been funded by the Canadian International Development Agency has been the subject of multiple studies over the last decade. The Forest Zoning Plan of Cameroon (PZF) or, indicative land use map, is an allocation of forest space in Cameroon for specific purposes (e.g., production, protection, recreation, learning, research). The PZF aims to determine which areas are allocated to the "Permanent forest domain" and which to the "Non-permanent forest domain", and to attribute shares within these allocations for national, municipal, and community forests, research areas, mine extraction, etc. (COMIFAC, 2011).

Photo 11.5: Dabema's characteristic crown (Piptadeniastrum africanum)

□ *Process*

In the 1990s, a first exercise worked to elaborate a land use plan for southern Cameroon. The plan covered the first four stages of the national forest inventory. The concerned area was mostly forested, with the exception of the capital Yaoundé and its surroundings. A forest inventory for the area had been drawn up and the map coverage was on a scale of 1/200,000. The method used consisted of:

- Defining forest boundaries;
- Mapping all existing PAs;
- Mapping all valid logging titles in the forest domain;
- Mapping plantations and agro-industrial areas;
- Identifying public land on both sides of access roads and inhabited zones for the purposes of rural development (e.g., agriculture, domestic purposes, community forests). Forecasts for land required for rural development were made for a 25-year period. This was carried out using the most recent national population data available at the time. Forests contained on this public land were included in the "non-permanent forest domain", thus allowing it to be used for a variety of different purposes.

The plan that resulted from this first exercise was the subject of Prime Ministerial Decree No. 95-678-PM of 18 December 1995, indicating appropriate land use in the southern forested area. It was designed to be used as a tool for natural resource planning, orientation and exploitation within the area.

The second exercise was carried out as part of Phase V of the reconnaissance inventory. It targeted relatively populated and developed areas, where most of the land was passably managed. The approach taken included wider consultation of stakeholders, and provided for the participation of administrations concerned with land use, representatives of local communities, donors and civil society. The work consisted of:

- Setting up a multidisciplinary, inter-ministerial team composed of representatives from 10 ministries: (i) environment and forests; (ii) agriculture; (iii) livestock, fisheries and animal industries; (iv) public investment and territorial management; (v) public works; (vi) territorial administration; (vii) tourism; (viii) urban development and housing; (ix) mines, water and energy; (x) scientific and technical research. This team was responsible for providing the forest ministry with sectoral information and for participating in the overall thought process;
- Identifying all the boundaries of classified forests and forest titles;
- Preparing a preliminary land tenure map to be circulated to various actors (i.e. public administrations, donors and civil society) for their comments;
- Review of comments by the Directorate of Forests;
- Preparing a tentative zoning plan;
- Organizing consultation meetings in each provincial capital, with meetings to be chaired by the Prefect, and in each department in the Southwest Region. These meetings brought together concerned local administrations, mayors, deputies, local NGOs and traditional chiefs;

Table 11.1: Status of the land use planning and forest zoning at the national level in the COMIFAC member countries

Country	Status of national process		Notes
	Land use planning	Forest zoning	
Burundi	Initiated	None	Forest Code indicates broad forest use categories. National director scheme for land use management development in progress (current stage: provincial director scheme of land use management). In the meanwhile, *de facto* zoning of PAs, forest reserves/remnants, agricultural lands, and mining permits.
Cameroon	Initiated	Completed (southern zone)	See section "Case study: Cameroon" for further description and analysis.
Central African Republic	None	None	Forest Code indicates broad forest use categories. National scheme for land use does not yet exist and its absence is causing sectoral conflicts on competing uses (e.g., logging, conservation, and mining). *De facto* zoning of PAs, logging concessions, and prospection mining permits.
Chad	No information		
DRC	Initiated (early reflections in context of REDD)	Initiated	See section "Case study: Democratic Republic of Congo" for further description and analysis.
Equatorial Guinea	None	None	Forest Code indicates broad forest use categories. National scheme for land use does not yet exist and its absence is causing sectoral conflicts on competing uses (e.g., logging, conservation, and mining). The law provides for a commission for classification and land use but it's not yet operational. *De facto* zoning of PAs, logging concessions, and mining permits.
Gabon	None (perhaps being studied)	None	Forest Code indicates broad forest use categories. National scheme for land use does not yet exist and its absence is causing sectoral conflicts on competing uses (e.g., logging, conservation, and mining). *De facto* zoning of classified forests, logging concessions, and mining permits.
Republic of Congo	Initiated	None	Forest Code indicates broad forest use categories. National scheme for land use does not yet exist and its absence is causing sectoral conflicts on competing uses (e.g., logging, conservation, and mining). Decree No 2009-304 of 31 August 2009 establishing an Interministerial Committee for dialogue in case of overlapping uses in natural ecosystems. *De facto* zoning of PAs, logging concessions, and mining permits.
Rwanda	Initiated/Completed?	None	Forest Code indicates broad forest use categories. Management and land use plan (Land use master plan): adopted by the Government in 2010.
São Tomé and Príncipe	No information		

- Amending the zoning plan to take into account the comments and recommendations made during consultations;
- Presenting the zoning plan for adoption by the multidisciplinary inter-ministerial team;
- Ensuring the reproduction and distribution of the land use or zoning plan.

□ *Consolidating the Forest Zoning Plan*

The tentative land allocation map, which is under the responsibility of the Ministry of Forests, needs to be consolidated. This consolidation involves using a participatory process that integrates all actors in rural areas. This is the "classification" process (see box 11.1). Classifying a forest creates an opportunity to establish a land title at the level of the State. Prior to classifying any plots of land in the "permanent forest domain", the Ministry of Forestry and Wildlife in Cameroon (MINFOF) issues a public announcement that indicates the Government's intention to incorporate the said forest land into the State's private domain. Any objections or claims with regard to the proposed classification can be submitted in accordance with specific procedures and deadlines. All actors involved in the rural sector are invited to meetings of the departmental Commission on classification. The classification procedure is presided over by the Prefect of the local community where the plot to be classified is situated. Finalized maps of the plots of land are drawn up and validated by the person in charge of the local land register.

Photo 11.6: Participative zoning exercises often begin with simple drawings on bare ground

□ *Management problems*

Contrary to the provisions contained in the 1994 Forestry Law, natural resource management, as practiced today, suffers from a lack of safeguards for forest land. In the case of permanent forests, neither the State nor communities have land titles although each classification decree incorporates the plots of land into their respective private domains. In Cameroon, there is no single benchmark that represents a guiding principle on which to base land titles. Sectoral ministries do not have a concerted approach when handling matters concerning the land. This is causing increasingly frequent inter-sectoral and local conflict in the field. Relevant information is available via a geodatabase that can be found in the Central Unit of Forestry Cartography (UCECAF) at the MINFOF. This information is up-dated as often as possible and in response to changes in limits, and is made available in versions of the "Interactive Forest Atlas of Cameroon" (see box 11.3).

Forest zoning was carried out by MINFOF, within the framework of forestry policy, and only reflected this sector's objectives. In 2009, MINFOF suspended this procedure until the Ministry of Economy, Planning and Regional Development (MINEPAT), which had been given a leadership role in this area, took over. In forest areas, the mining and agro-industrial sectors are expanding rapidly and conflicts have arisen with regard to overlapping land allocations. Without an agreed and adopted land use plan, there is the risk that these conflicts will increase and jeopardize development efforts and sustainable land management.

Box 11.3: Practical applications for the forest Atlases

Lyna Bélanger
WRI

Among other products forest Atlases contain:

- A user-friendly mapping application (GIS) which provides visual details of country-specific thematic areas related to the forest. Data is collected in a single geo-referenced database and presented as vector mapping data, descriptive data and associated metadata;
- A summary document, describing the thematic areas in detail and the resulting practical applications that can be useful for decision-makers;
- A poster showing the allocation of the State forests.

In addition to zoning, the forest Atlases are geomatic tools that can be used for forest management in general, particularly for applications such as:

- Assistance in evaluating and monitoring the allocation of new forest concessions, classified forests, community forests and support in deciding the precise demarcation of these zones;
- Support for decision-making through the analysis of different land uses, their dynamics and possible impacts on protection zones;
- Support for conflict resolution through improved identification of problems related to overlapping of territorial limits, improved planning of on-site monitoring missions, identification of additional zones for the parties involved;
- Support for law enforcement of road construction in or near protected areas by drawing attention to irregularities to provide improved guidance for land monitoring;
- Support for development planning by identifying vital routes for isolated local communities and reducing to a minimum the environmental impacts and costs caused by the construction of new routes by taking full advantage of existing ones;
- Assistance in the preparation of forest management plans;
- Assistance in analyzing levels of forest logging (in relation to spatial distribution and available road infrastructure) and support for forest planning, for instance by: (i) showing that a significant part of total timber production comes from unmanaged zones; (ii) analyzing chronological data for production planning purposes and timber processing; (iii) highlighting the ecological and social consequences of forest logging on a particular zone;
- Monitoring tax revenues in conjunction with a forest statistics and traceability system;
- Support for the Control and Internal Verification Direction in prioritization of control and monitoring missions to determine operators who respect legal regulations, such as deadlines, land areas, production…

Interactive forest Atlases are available on the WRI website (www.wri.org) and on websites of concerned ministries, wherever feasible.

□ *Outlook*

Territorial management in Cameroon falls within the scope of MINEPAT, which should take an active stance on:

- Establishing a participatory process for land use planning;
- Coordinating and managing land allocation at the national level;
- Developing legislation with regard to territorial management.

In this regard, some projects are already under way:

- Revision of forest and mining codes with the support of the Network of Parliament members in Central Africa (REPAR) and MINFOF partners;
- Establishment of a geodetic network under the auspices of the Ministry of State Property and Land Tenure (MINDAF) and in line with the African Geodetic Reference Frame (AFREF);
- Elaboration of a topographic map of Cameroon (MINEPAT/INC);
- Elaboration of a global zoning plan for Cameroon (MINEPAT).

Case study: Democratic Republic of Congo

□ *Overview*

There are about 145 million hectares of forest in DRC, representing about 60 % of the national territory (see table 1.1; Vancutsem *et al.*, 2006; Vancutsem *et al.*, 2009; de Wasseige *et al.*, 2009). About 12.2 million hectares (administrative surface area) of forest have been zoned as commercial timber concessions (about 8 % of the national territory) and 16 million hectares (more or less 11 %) of forest are zoned as "classified forest" (national parks, wildlife reserves, etc.) (MECNT, 2009a; MECNT, 2011a; Toham *et al.*, In Press; USFS, 2009 & 2010b – see figure 11.1).

The 2002 Forest Code envisions the zoning of DRC's forest estate into "permanent production forests", "protected forests" and "classified forests" (figure 11.2). Non-zoned forests remain protected forests. Permanent production forests include current timber concessions as well as tracts of forest for future allocation as timber concessions. In effect, forests designated as permanent production could remain in reserve for commercial timber operations carried out by private companies or local villages. The Code allows a local community to apply for a timber concession.

Photo 11.7: After what may have started as a drawing on the ground, zoning exercises are recorded on more permanent materials

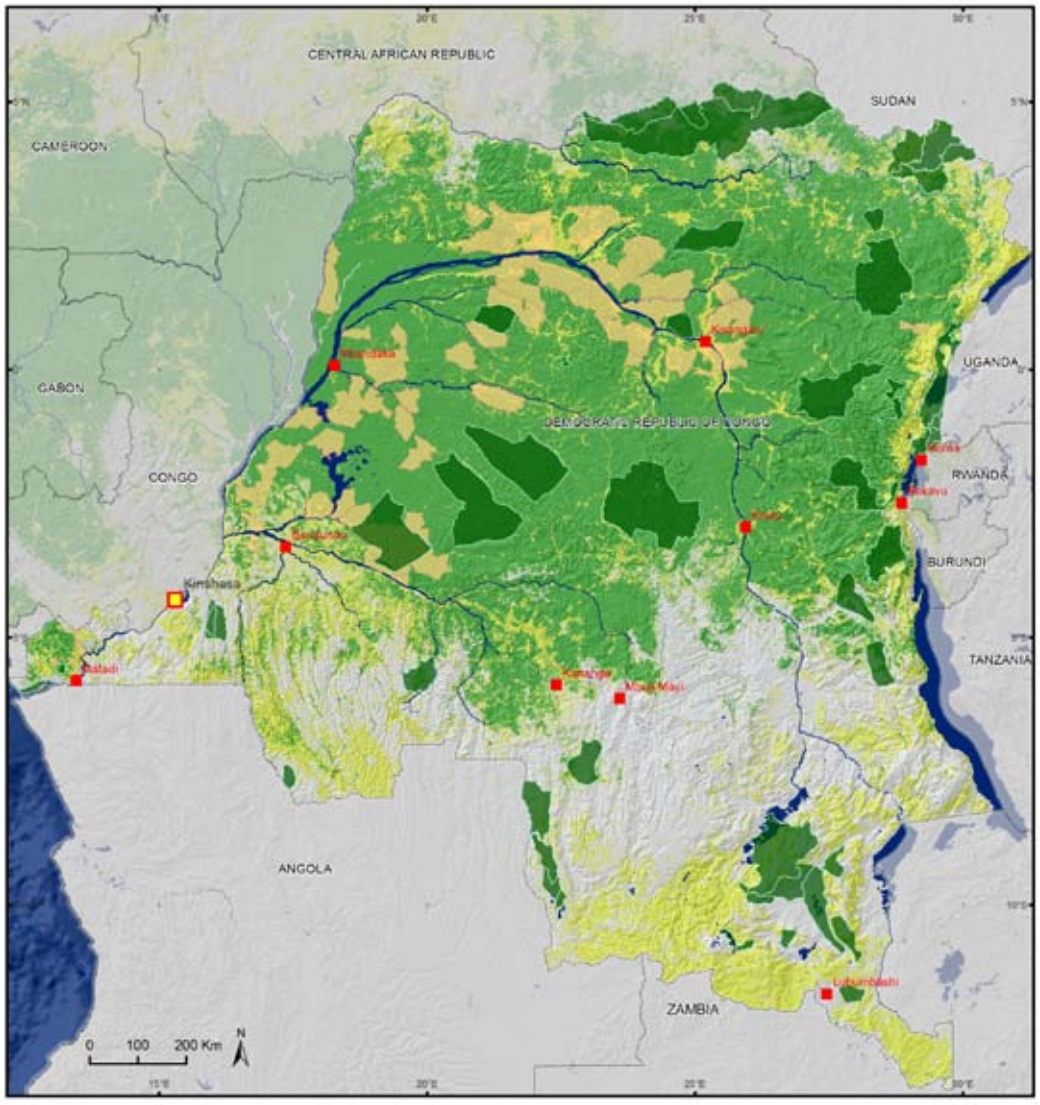

Figure 11.1: Distribution of protected areas and logging concessions already delineated in DRC
Sources : OFAC, WRI

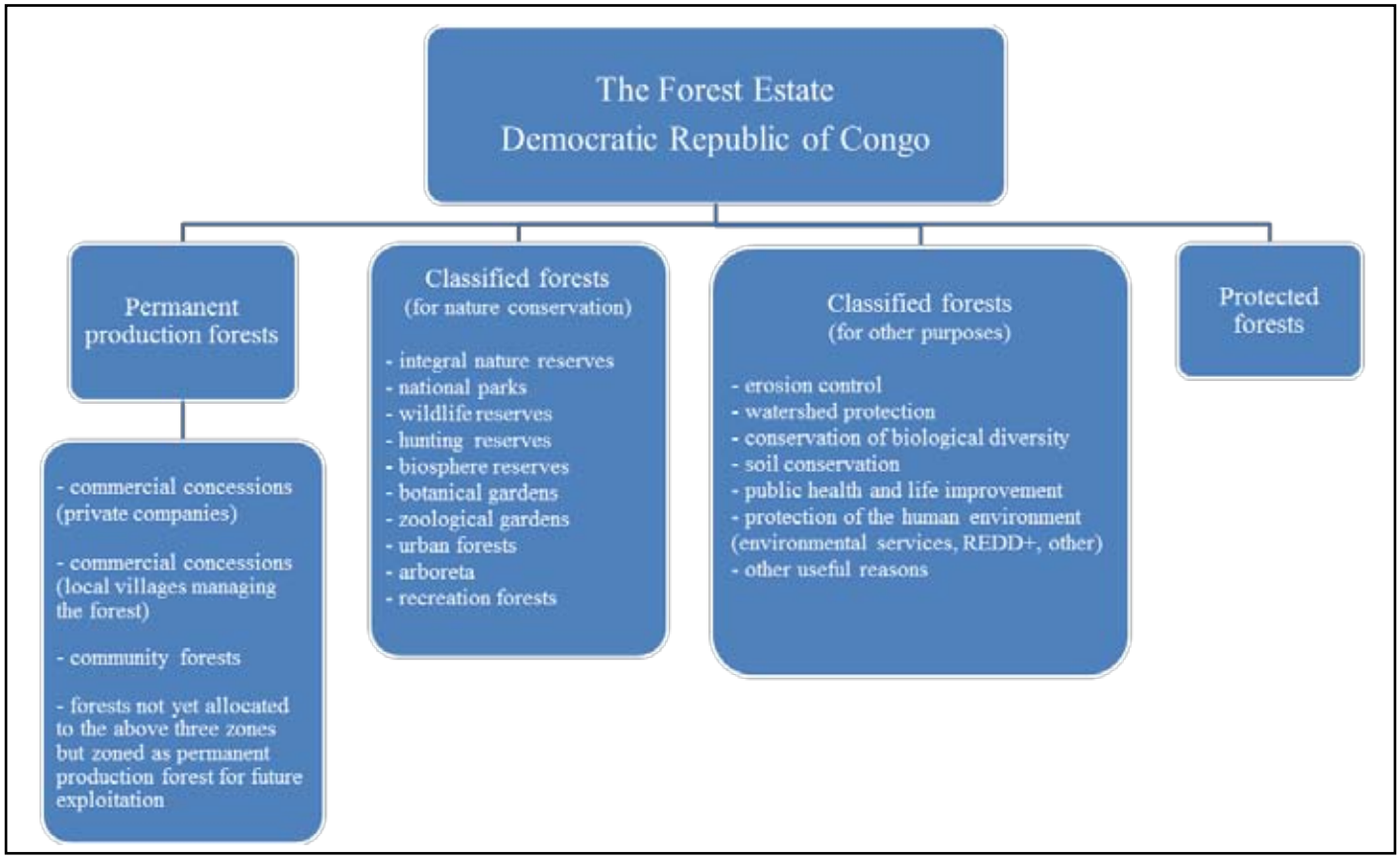

Figure 11.2: Legal forest classification in DRC according to the Forest Code of 2002. "Protected forests" are defined as forests that have not been allocated to permanent production forests, timber concessions or protected areas (classified forests). "Protected forests" could also be converted into palm plantations, mines, roads and other uses depending on the recommendations of the National Steering Committee for Forest Zoning (Comité national de Pilotage du Zonage forestier - CNPZF).

The Forest Code, the policy of the DRC Government (*Institut congolais pour la Conservation de la Nature*, 1973) and draft DRC legislation[67] also requires the placement of millions of additional hectares of forest into protected areas for nature conservation. In 2007, MECNT and partners identified 41 priority areas and 13 corridors from which PA could be established (Toham *et al.*, In Press).

The Forest Code gives a broad rationale for protected areas (called "classified forests"). Classified forest is not just about the zoning of national parks and the protection of wildlife, but also allows the establishment of classified forest for the protection of soils and watersheds, enhancement of the human environment and for any other reason judged useful by DRC (Article 13 of the Forest Code). In general, classified forest could be established to provide a myriad of environmental services to local people and the nation of DRC. As forest zoning proceeds in DRC it is critical that the public and government officials realize that the Forest Code is quite flexible and that there are many justifications for classified forest.

Lastly, the 2002 Forest Code (Article 22) hints at the possibility of another macro-zone, the "community forests", often called CBNRM (Community Based Natural Resource Management) where local communities essentially manage forests (Yanggen *et al.*, 2010; USFS, 2008). Vast areas of DRC have been proposed as CBNRM although no ministerial declarations have formally established any CBNRM (Dupain *et al.*, 2010a; Mehlman, 2010). The DRC Government is currently developing definitions and other criteria for CBNRM. In anticipation of such guidelines and procedures in DRC, various communication structures among local communities have been established in many areas to discuss the management of forests and other natural resources and to draw tentative CBNRM boundaries (see below). It is likely that DRC will first identify forests of permanent production and classified forests, and make adjustments for CBNRMs where communities desire such areas.

[67] Draft Nature Conservation Law, Ministry of the Environment, Conservation of Nature, and Tourism (MECNT), DRC, 2009.

Under the DRC Constitution, the forest domain, zoned or not zoned, is part of the State. In essence, DRC forests are national forests that are slowly being zoned into various uses. Forests that are not zoned into the above categories are called "protected forests". However, people have extensive rights in protected forests (Forest Code, 2002). Indeed, protected forest can be converted into agricultural plots of maximum 2 ha, although provincial authorities must regulate or zone the extent of such agriculture/rural development (figure 11.3). On top of this are other sector interests such as mining and commercial agriculture that may demand forest areas for their purposes.

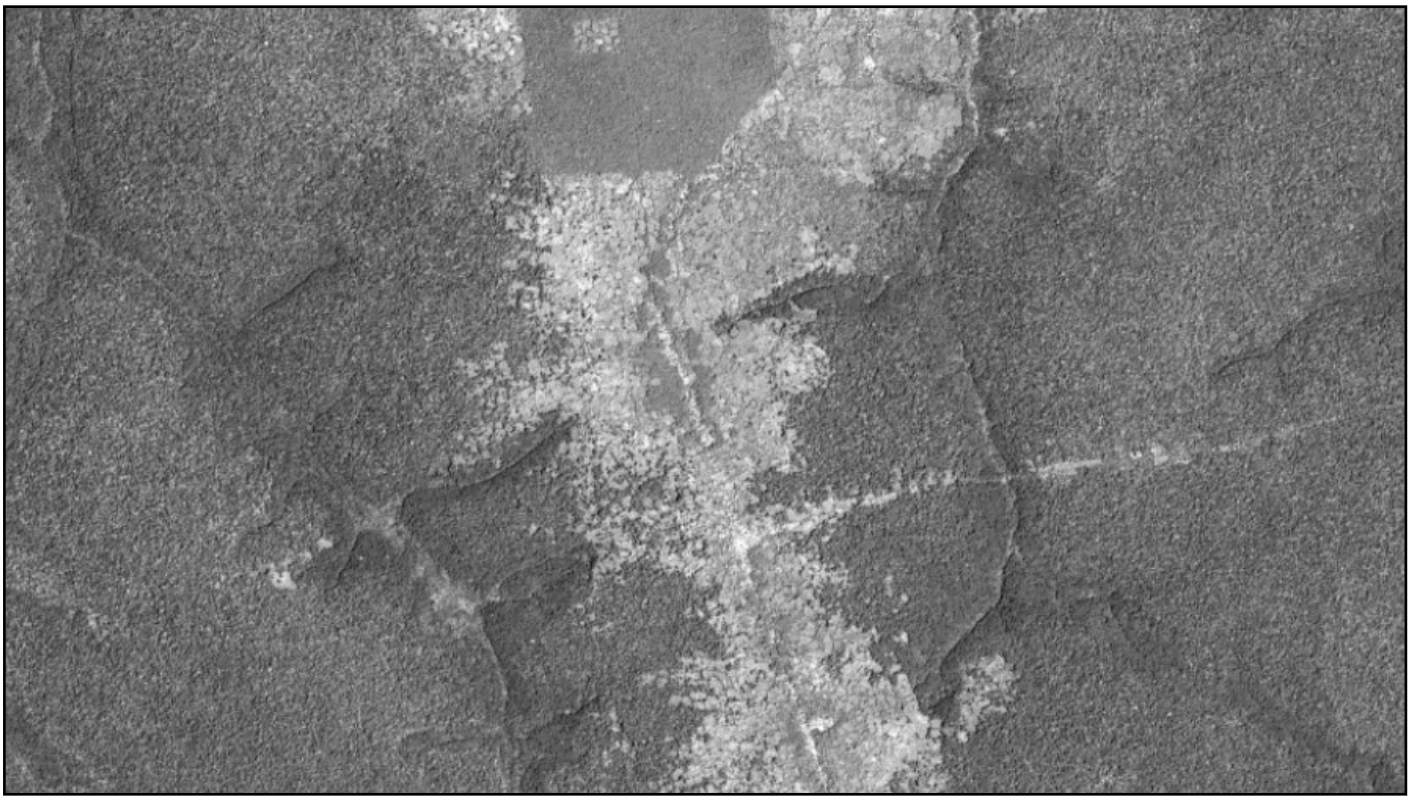

Figure 11.3: Villages and agricultural complexes located along a road in the protected forest of the Maringa-Lopori-Wamba Landscape, Equateur Province, DRC. Forest zoning must take into account human population expansion and required expansion of agriculture into protected forest. Central to zoning will be the accurate mapping of the extent of protected forest used by villages. By understanding the needs of the people, the National Steering Committee for Forest Zoning (CNPZF) can make informed decisions about classified forests and forests of permanent production

Source: US National Geospatial-Intelligence Agency

□ *Role of the DRC Government in forest zoning*

Forest zoning is not simply a matter of listening to local communities and doing exactly what they say. DRC has national and international issues and commitments at stake in the management of its forests including economic development, human rights, carbon emissions, climate, and conservation of biological diversity, to name a few. An institutional process and oversight of zoning will facilitate and allow zoning to occur at a local level and permit the incorporation of national and international obligations.

Since 2009, important milestones have been reached by the DRC Government in order to launch forest zoning in a participatory fashion. New guidelines ensure adequate forest zoning in light of international principles of social and environmental safeguards (MECNT, 2011b). The guidelines are intended to apply the 2002 Forest Code mainly with regard to (i) transparency in the allocation of forest concessions and forests of permanent production, (ii) the participation of the local communities and indigenous people in the forest zoning process, and (iii) the zoning of at least 15 % of the national territory into classified forest.

□ *Macro and micro-zoning process*

Macro-zoning is a national, provincial, or at least landscape level process that identifies existing or new/possible logging concessions, permanent production forests, PAs, and other major land use zones identified in DRC law. Micro-zoning is a process for further identifying spatially distinct areas within a macro-zone where management actions and guidelines differ.

In 2009, a National Steering Committee for Forest Zoning (*Comité national de Pilotage du Zonage forestier* - CNPZF) was established to oversee the zoning of forests in DRC[68]. Forest zoning is now officially recognized. Recommendations about macro-zoning including new permanent production forests, classified forests, and CBNRM will be made by the CNPZF after consultation with a forest planning/zoning team, and local forest zoning committees at the territorial level (figure 11.4).

[68]Ministerial Order No. 107/CAB/MIN/ECN-T/15/JEB/009 of 20 August 2009, pertaining to the creation, composition, organization and functioning of the National Steering Committee for Forest Zoning;

Ministerial Order No. 018 of 28 April 2010, pertaining to the nomination of members of the National Steering Committee for Forest Zoning in DRC.

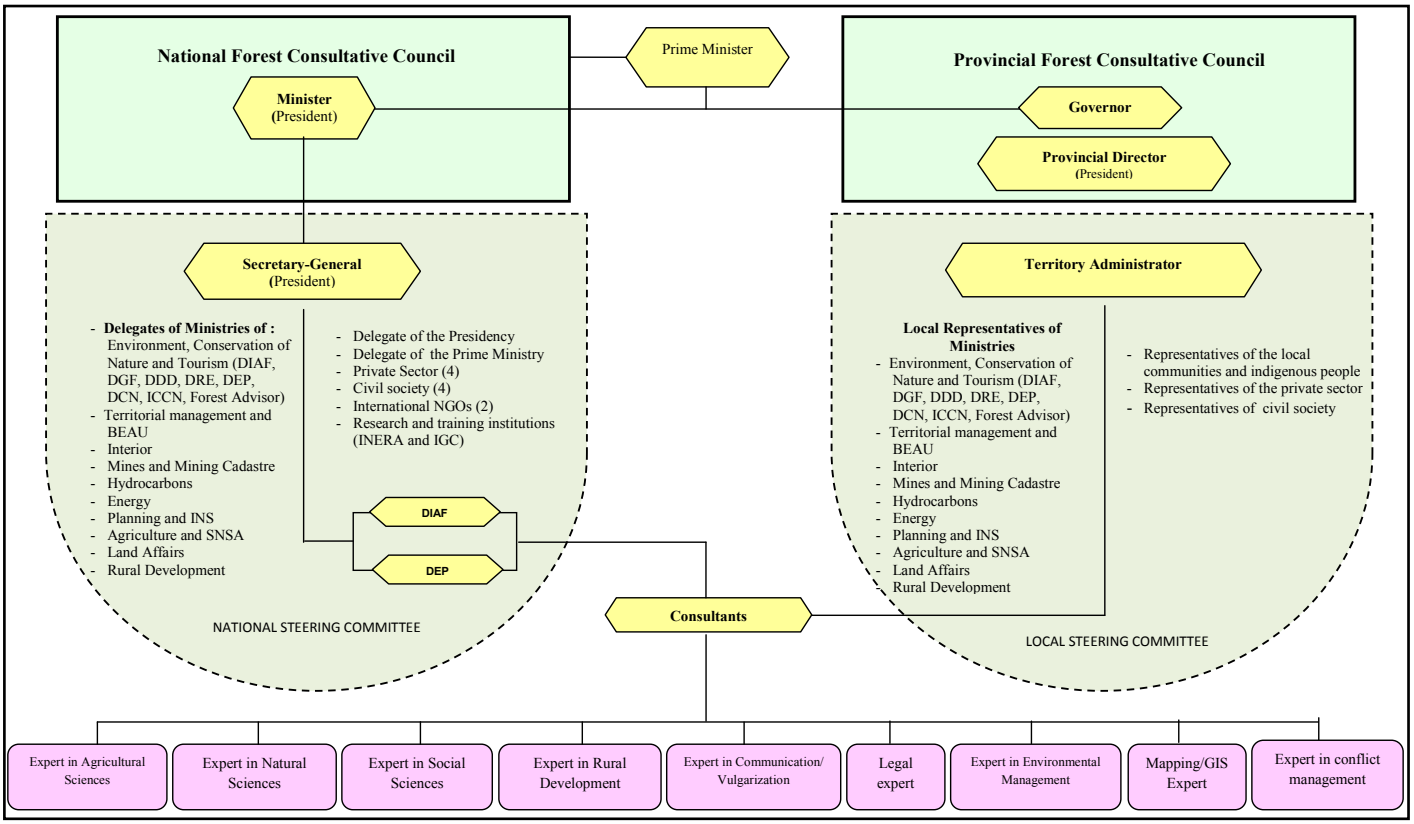

Figure 11.4 : Supervision of forest zoning in DRC; DIAF (Direction des Inventaires et Aménagements forestiers); DGF (Direction de Gestion forestière); DDD (Direction du Développement durable); DRE (Direction des Ressources en Eau); DEP (Direction des Études et de la Planification); DCN (Direction de la Conservation de la Nature); ICCN (Institut congolais pour la Conservation de la Nature); BEAU (Bureau d'Études d'Aménagement et d'Urbanisme); IGC (Institut géographique du Congo); INERA (Institut national d'Études et Recherches agronomiques); INS (Institut national des Statistiques); SNSA (Service national des Statistiques agricoles)

Source: Standards for Forest Macro-zoning: operational guide, Ministry of the Environment, Conservation of Nature, and Tourism (MECNT)

The CNPZF is not a day-to-day working body but rather a board of oversight and approval, meeting periodically to make major decisions about zoning. Given the extent of forest in DRC and available means, the CNPZF is focusing at first on key sectors (e.g., forest production, conservation, agriculture, rural development, mines, energy, transport) in order to:

- understand the current status of forests;
- analyze the various sectors and the potentials for and constraints on development;
- measure the national sector goals in the short, middle and long term;
- prepare the choices and possible arbitrations necessary.

The CNPZF will ensure that various ministries (managers of the resources and space) and others stakeholders are cooperating in the tasks of forest zoning. There will likely be many conflicts as the CNPZF begins its work and the nature of forest zoning is revealed. The laws and regulations governing other governmental sectors may affect forest zoning. Some areas of forest may be zoned for mining, agriculture, roads and other uses. Indeed, various agricultural and forest zoning efforts are already underway in Bandundu and elsewhere (Coordination nationale REDD, 2010c; Impreza-Servisi-Coordinati, 2010a-c).

Subsequent activities after macro-zoning center on moving from the "vision", the forest zoning plan, to "action", the classification of forests and the public inquiry required prior to the granting of concessions. It is during this stage that populations will be most consulted and solicited. These activities are clearly identified in the following regulatory texts:

- "Decree No. 08/08 of 8 April 2008 laying down the classification and declassification procedure for forests". This text specifies the process for forest classification;
- "Ministerial Order No. 024 of 7 August 2008 establishing the public inquiry procedure prior to the granting of forest concessions".

In addition, the Directorate of Inventories and Forest Management has an operational guideline entitled: "Normes d'affectation des terres" (Standards for Land Allocation). This document provides the methodology to use to determine land allocation within forest concessions. The procedure consists of subdividing the concession into three types of series, which represent priority allocations: (i) conservation, (ii) protection, and (iii) timber production.

It is at this stage that the notion of micro-zoning comes into play. Participatory mapping can be a useful tool in contexts where it is important to understand the zones of influence of local populations.

Photo 11.8: Natural forests, farming and plantations will come into increasing contact with each other in the future

Box 11.4: A model of an equitable social clause agreement for the participatory management of natural resources in the DRC

François Makoloh, Bruno Pérodeau
WWF

One of the main innovations in the Democratic Republic of Congo's 2002 Forest Code is the concept of "social specifications", as detailed in Article 89[69]. However, the means for applying this new forest regulation still needed to be defined.

After a series of intense deliberations to elaborate a text to apply this Article of the Code, a first Decree was adopted in 2008. The Decree[70] made it obligatory to consult local communities on the rights and obligations of the parties as well as on the involvement of the decentralized forest administrations; however, the modalities for applying the law remained too vague for the principal stakeholders involved. In particular, the concept of "local community and/or local indigenous peoples", the direct beneficiaries of this clause, and the amount these beneficiaries would receive in return for the loss of certain benefits provided by the forest remained undefined.

In early 2009, under WWF coordination, a small group of actors drew up a draft model "Agreement" to facilitate the negotiation of social specifications between local communities (including indigenous populations) and forest concessionaires. The contract outline was designed to address sensitive issues that may remain unresolved, as well as potential stumbling blocks that may arise in the implementation of agreements. Who would do what? For whom? Where? How best to ensure that adopted agreements would be recognized and respected and would benefit the communities concerned?

Most actors involved in this process strove to assure real involvement of the local communities to ensure true participatory management of natural resources. The modalities for applying the social clause follow the basic principles of participatory management by clearly defining the parties, their rights, responsibilities and the modalities for managing profits and potential conflict, as well as by ensuring the representativeness and legitimacy of the parties.

A crucial aspect of the process was defining "local neighboring communities". This issue was resolved by directly linking customary laws to the social clause through socio-economic studies and preliminary participatory zoning to clearly map out customary laws. The maps annexed to contracts, and recognized by the parties, define the beneficiary communities and the forests where forest operators have commitments.

A second main concern related to the pecuniary value of this clause and the management of generated funds. In the context of the DRC, where communities often ask for unrealistic support (e.g., airports, helicopters, universities), this question needed to be clarified. On the basis of open discussions with the private sector, and with specific reference to the sub-region and certified forest concessions, it was decided community support should be provided at a rate of $ 2 to 5/m^3 of timber removed by the forest company. This support is to be paid into a "Local Development Fund". The fund is to be managed by a Local Management Committee (LMC) consisting of the forest operator and representatives elected by the community. This set up has also partly addressed concerns about legitimacy, representativeness, transparency and the participation of local and indigenous communities.

Once completed, the Agreement established by a Ministerial Decree[71] is accessible to the public as an Annex to the forest concession's contract and its set of specifications. Currently, several forest operators, the DRC forest administration as well as local, national and international NGOs are active participants in this process. This mobilization and the involvement of a wide variety of actors is a promising sign.

For a country that has suffered for nearly four decades from an endemic socio-economic crisis and widespread poverty, this model agreement has the potential to be a key tool in poverty reduction and ensuring the effective participation of local communities in natural resource management. With the official establishment of the REDD+ process in Cancún, this model agreement can likely be further developed and applied in the context of the national strategy for the reduction of emissions caused by deforestation and the degradation of forests in the DRC.

[69]Law No. 011/2002 of 29 August 2002, to enact the Forest Code of the DRC.

[70]Ministerial Decree No. 28/CAB/MIN/ECN-T/15/JEB/08 of 7 August 2008 establishing model contracts and corresponding specifications for exploitation concessions for forestry products.

[71]Ministerial Decree No. 23/CAB/MIN/ECN-T/28/JEB/10 establishing the model Agreement constituting the social clause in the specifications of the forest concession's contract and its annex.

Status at the CBFP landscapes level

Since the creation of the CBFP in 2002, there has been significant investment and progress in supporting land use planning and management at the large landscape scale; in some cases crossing national borders, and in others at the sub-national level. Many innovative land use planning and zoning activities and processes are underway across these CBFP landscapes (see Yanggen *et al.*, 2010).

Previous State of the Forest reports (2006 and 2008) presented detailed CBFP landscape narrative of context, threats, activities, as well as data on various management and process indicators. Here is a summary of the management status across the CBFP landscapes by way of introducing the overarching CBFP macro-zoning approach.

Total area in 2010:

- Total area for all landscapes in 2010: 76,686,829 hectares;
- Total area under improved management for all landscapes in 2010: 44,532,826 hectares.

Table 11.2 provides more disaggregated data on the surface area of the various common macro-zones under improved management across the Congo Basin within priority landscapes (data of 2008).

Table 11.2: The extent of macro-zones in CBFP landscapes in 2008

Macro-zone type	Number of macro-zone	Area (ha)
Classified forest	37	17,883,079
Community Based Natural Resource Management (CBNRM)	69	21,040,366
Extractive Resource Zone (ERZ)	41	14,986,727
Total	**147**	**53,910,172**

Source: CARPE

The next section presents a case study on macro and micro-zoning within the Maringa-Lopori-Wamba (MLW) Landscape, in DRC.

Case study: The Maringa-Lopori-Wamba Landscape

□ *Overview*

The Maringa-Lopori-Wamba (MLW) Landscape, located in Equateur Province, DRC, covers 73,000 km^2. The MLW project (USAID/CARPE) was initiated by the African Wildlife Foundation (AWF) who has led its activities since 2003. Subsequently, AWF and a consortium of partners have worked toward meeting the USAID/CARPE Strategic Objectives to "decrease the destruction of habitat and the loss of biodiversity through better local, national and regional governance of natural resources aiming at reduction of poverty" (Dupain *et al.*, 2010a).

Land use planning has been the overall approach to achieve the above Strategic Objectives in the MLW Landscape. The project considers land use planning and zoning as central components of developing the means for continued sustainable natural resource management throughout the landscape. The land use planning process takes into account the needs of local communities while conserving forest in key areas for biodiversity as defined by the results of field surveys and landscape-wide patterns of agricultural land use and forest change detected by remote sensing and spatial analyses. The following desired outcomes (conditions) were identified by the MLW Consortium:

- Creation of an inter-connected network of PAs that assures continued species viability;
- Assurance of enough forest land for conversion to satisfy the agricultural livelihood needs of local communities;

- Assurance of enough forested land to satisfy both the need for maintaining biodiversity habitat and sustaining community dependence on the collection of non-timber forest products (NTFP) for local livelihoods and social well-being.

Realization of these conditions requires macro-zoning and a subsequent map of spatially defined major use zones (delineation of space for rural development, development of a network of PAs, and delimitation of community forests, for example). Using this map, priorities and opportunities for micro-zoning can be located.

The identification of these priorities depends on the focus of the program. The formal establishment of macro-zones requires the development of management plans for timber concessions[72], PAs or community forests[73]. These management plans require the delineation of micro-zones supporting a variety of land use activities and specific management strategies. In the MLW Landscape, the identification of priority areas for micro-zoning was based on the identification of "hotspots" recognizing areas where there is simultaneously high biodiversity importance and increased pressure from rural expansion and deforestation. These areas were identified using a variety of maps and spatial analyses of the geographic distribution of land use types and patterns of land use change throughout the landscape. The MLW partners focused on micro-zoning the unprotected "protected forests", areas that are more vulnerable to unsustainable land use change and deforestation, especially in areas of high population density.

In the MLW Landscape, it is estimated that more than 50 % of the forest will remain "protected forest". As part of MLW's micro-zoning objectives, the MLW Consortium is developing a formal strategy to distinguish within this forest class the "non-permanent protected forests" (also called the "Rural Development Zone" or RDZ, designated for the sustainable expansion of agricultural activities under a management plan) and the "permanent protected forests" (designated as protected forests for Community Based Natural Resource Management or CBNRM).

Both indicative macro-zoning and micro-zoning require public participation and formal recognition. Depending on the scale of the zoning (macro *vs* micro), the mechanisms to achieve full stakeholder participation and formal recognition are different, as stakeholders vary between the two scales (see above). Formal recognition processes might also require stronger outreach to different levels of political administration, depending on the scale of the zoning. The work in MLW illustrates these distinctions and highlights the differences between macro and micro-zoning for land use planning.

Photo 11.9: Forest concessions are one of the most widespread examples of the ERZ concept (Extractive Resource Zones) in Central Africa

[72]Forest Code of 2002 and Ministerial Order No. 034/CAB/MIN/ECN-EF of 5 October 2006 establishing the procedures for setting up, approving and implementing the management plan for timber production forest concessions.

[73]Ministerial Order No. 038/CAB/MIN/ECN-T/15/JEB/2008 of 22 August 2008 establishing the modalities for developing, approving and implementing the management plan for a classified forest.

□ *Macro-zoning*

Data collection and spatial mapping

In the MLW Landscape, several extensive macro-zones already exist such as the Lomako Yokokala Faunal Reserve (established from a 2004-2006 macro-zoning exercise culminating from a longstanding effort to create a PA for the conservation of bonobos) and a number of timber concessions (MECNT, 2011a) established during a nationwide review of DRC timber concessions in 2009. Using preliminary data collection comprised of biodiversity surveys complemented by input from various stakeholders in the MLW Landscape, the MLW Consortium produced a map of tentative macro-zones for the landscape (figure 11.5). The zones include existing timber concessions, existing and proposed PAs, the RDZ located along the road network (designated as the "non-permanent protected forest" zone as described above), and potential CBNRM (designated as the "permanent protected forest" zone also described above). Data gap analysis and participatory data collection, followed by spatial mapping and modeling informed the process of defining the macro-zones.

Spatial mapping and modeling have been paramount to achieving an understanding of the geographic priorities for conservation and rural development for land use planning in the MLW Landscape. The University of Maryland, as part of the MLW Consortium, has generated a suite of spatially-explicit conservation planning models for the landscape to identify:

- Areas of highest and lowest human influence (defined by human accessibility and forest degradation as threats to terrestrial biodiversity) and potential human-wildlife conflict;
- Wildlife corridors connecting areas of lowest human influence and existing PAs (classified forest);
- Areas of greatest conservation priority;
- Areas most suitable for future agricultural expansion given the spatial distribution of human populations and locations of conservation priority areas.

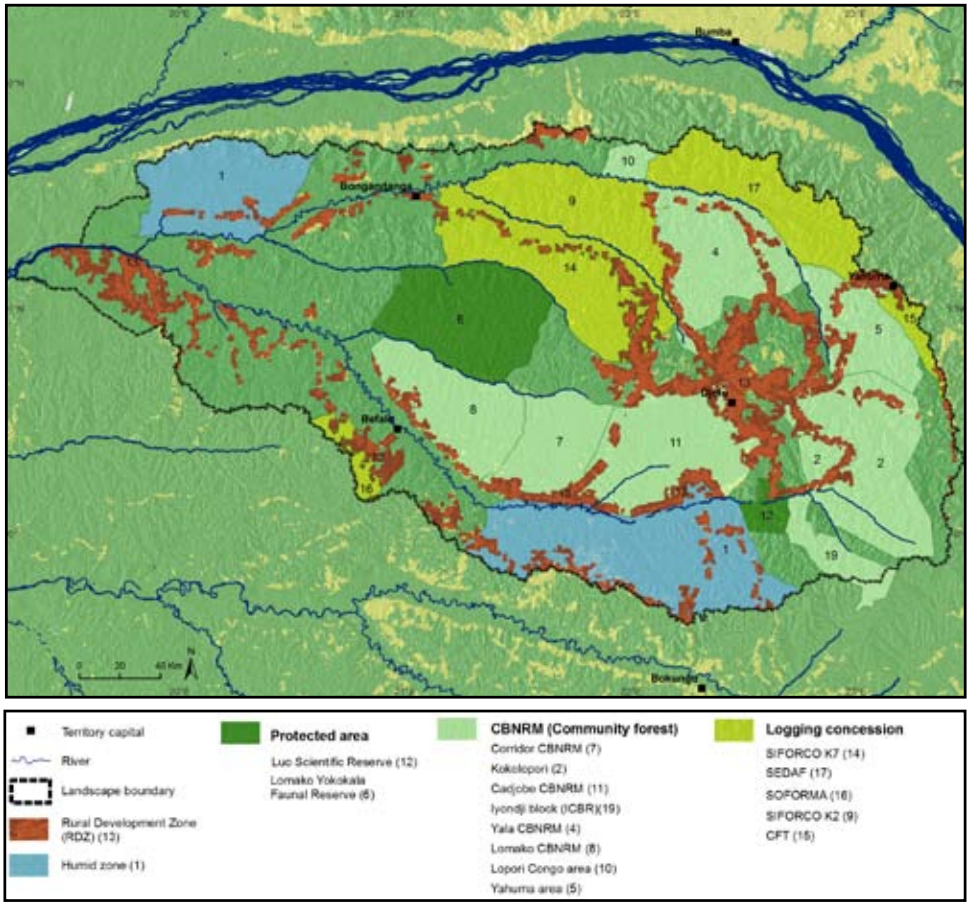

Figure 11.5: Tentative macro-zones for the Maringa-Lopori-Wamba Landscape
Source : MLW Consortium

A threat-based model was built in a Geographic Information System (GIS) to identify locations of forest blocks having lowest human influence and where forest conservation efforts could be prioritized. Wildlife corridors connecting these forest blocks were then modeled[74]. In addition, an optimization model was generated to identify the most suitable areas for the establishment of the RDZ at minor "cost" for conservation. Given locations of important forest blocks and the wildlife corridors connecting them, the model determined areas where agricultural expansion might be encouraged using an identified target of land needed to be converted for human livelihoods by 2015. The resulting map (figure 11.6) displays the most optimal areas for future agricultural expansion based upon current distributions of human settlement, agricultural land use, projected human population expansion, and locations of high conservation priority (including classified forests, remote forests and wildlife corridors). The results of these models, built at the broad landscape scale, are meant to be indicative and interpreted somewhat loosely from a large scale perspective. Still, they have been valuable tools for creating a clearer understanding of geographic processes and priorities across the MLW Landscape. Replicating these types of models will become more important throughout DRC in the future as the CNPZF pursues macro-zoning at a national scale.

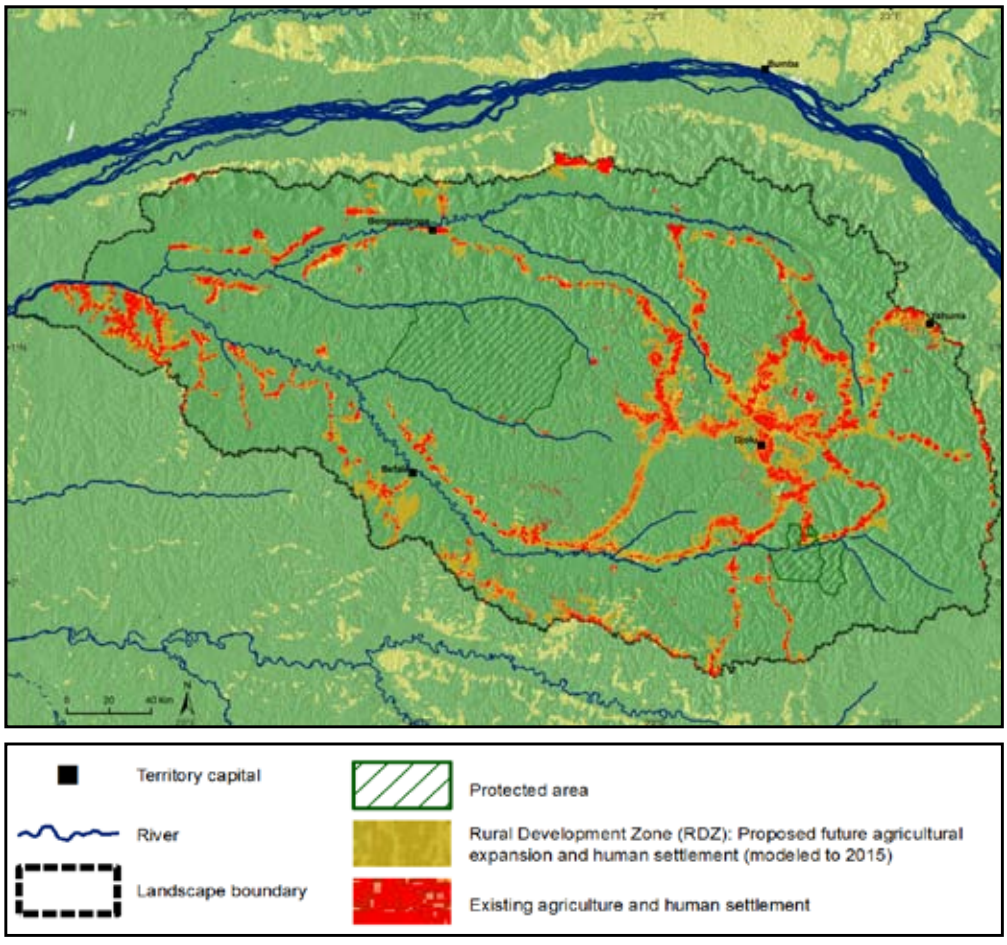

Figure 11.6: Location of the most optimal areas for future agricultural expansion
Source : MLW Consortium

[74] Using the Corridor Designer tool of ArcGIS (http://corridordesign.org/).

Public participation

At the MLW Landscape level, a Local and National Partner Committee (LNPC) is composed of the Consultation Frameworks (Cadres de Concertation - CdCs) for each of the four administrative territories in the MLW Landscape. The CdCs are comprised of representatives from civil society and local authorities of varying notability and gender, as well as representatives from the private sector and local representatives of the government. In effect, the CdC fulfills the CNPZF's territorial representation. Two representatives of the LNPC are members of the MLW Landscape Land Use Planning Committee as part of the MLW Consortium. The primary objectives of the CdC are to:

- Participate in the design of the MLW land use plan and increase the understanding of its rationale, development and execution;
- Create a platform for the expression of concerns and conflicts brought about by the land use planning process;
- Inform landscape stakeholders about the activities of the MLW Landscape project;
- Coordinate and monitor activities of the project;
- Advise the LNPC on the progress of the MLW land use planning program.

Public participation at the macro-zone level centers on the formation of a Local Management Committee (LMC) for each macro-zone. The LMC interacts with the MLW Consortium on the land use planning process and is the major entity directly involved in coordinating public participation activities at the macro-zone level. Because macro-zones often geographically span multiple administrative and political units (such as the administrative territories, for example), the LMC is composed of representatives from multiple administrative levels and units.

Formal recognition

The MLW Consortium has created a MLW land use planning Steering Committee consisting of MECNT, provincial authorities, and national and international NGOs. This Steering Committee approves the work plans of the MLW program and assures, as such, that the program responds to the priority agenda of the DRC for national land use planning activities.

Since creation of this Steering Committee, the CNPZF has been established and the process for macro-zoning has been made official. Formal recognition of the participative macro-zones as created in the MLW land use plan will now be presented to the CNPZF for approval by a ministerial declaration. In 2009, the MLW Consortium entered into an agreement[75] with MECNT to carry out the zoning and land use planning in the MLW Landscape with subsequent formal recognition of the zoning at the DRC national level.

□ *Micro-zoning*

Data collection and spatial mapping

The MLW Consortium prioritizes micro-zoning based on identification of areas achieving the aforementioned desired outcomes. Initial participative surveys in the landscape indicate that local communities consider the agricultural sector their top priority for income generation. Access to NTFPs (bushmeat, fruits, and medicinal plants, for example) is also an important asset for social well-being and livelihood security. The forests which provide NTFPs to local communities also provide important habitat to a range of species that underpin biodiversity in MLW. As such, the MLW Consortium has identified three criteria for the development of micro-zones via a participatory process:

- Set aside enough protected forest for conversion into non-permanent forest needed to sustain agricultural livelihoods;
- Identify enough protected forest for conversion into permanent community forests for sustained dependence on NTFPs;
- Assure wildlife habitat connectivity between the classified forests for continued species viability.

The spatial modeling exercises outlined in the previous section assisted in the preliminary identification of the above protected forest at a coarse scale by allowing for the identification of the forests most important for connectivity between the protected areas but simultaneously identified as being under the biggest threat for land conversion through slash and burn agriculture. At the local scale, the spatial models are complimented by fine-scale participatory mapping and data collection with local communities to achieve distinction between the permanent forest (CBNRM) and the non-permanent forest (RDZ).

A pilot project is in place in eastern MLW to engage in participatory micro-zoning of a 2,000 km^2 area located between two classified forests. This area, located just west of the town of Djolu, contains a large center of slowly expanding agricultural production in addition to a

[75] Ministerial Order No. 106/ CAB/MIN/ECN-T/15/ JEB/09 of 20 August 2009 defining provisions for implementing the project of participatory zoning in the Maringa-Lopori-Wamba Landscape.

large wildlife corridor important for connectivity between the two classified forests. The MLW program is engaging in participative micro-zoning and livelihood improvement for local communities living in 27 villages identified through a voluntary process.

Through participative mapping complemented by the use of 30 m resolution Landsat satellite imagery and GPS data collection, the limits of the villages' historical agricultural and forest boundaries are identified and mapped in a Geographic Information System (GIS). Figure 11.7 shows an example of a map that was generated by this process for one village in the study area. The map displays a Landsat satellite image in the background. A yellow polygon delineates the outer boundary of the village's forested areas that the local community has traditionally relied on for the collection of NTFPs. As seen on the map, this boundary extends 14 km^2 northward and 7 km^2 southward from the road. This forested area can consist of a combination of secondary forest (abandoned agricultural fields), primary forest, and swamp forest. The agricultural boundary, which extends not as far outward from the road, is shown in the map as a smaller polygon (black with diagonal dotted lines) in the center of the village.

In the formal micro-zoning process, the forest and agricultural polygons shown on the map are considered two separate micro-zones. The larger forest boundary delineated by the yellow polygon is considered the permanent forest micro-zone, or CBNRM area, while the agricultural boundary delineated by the smaller black polygon is considered the non-permanent forest micro-zone, or Rural Development Zone (RDZ).

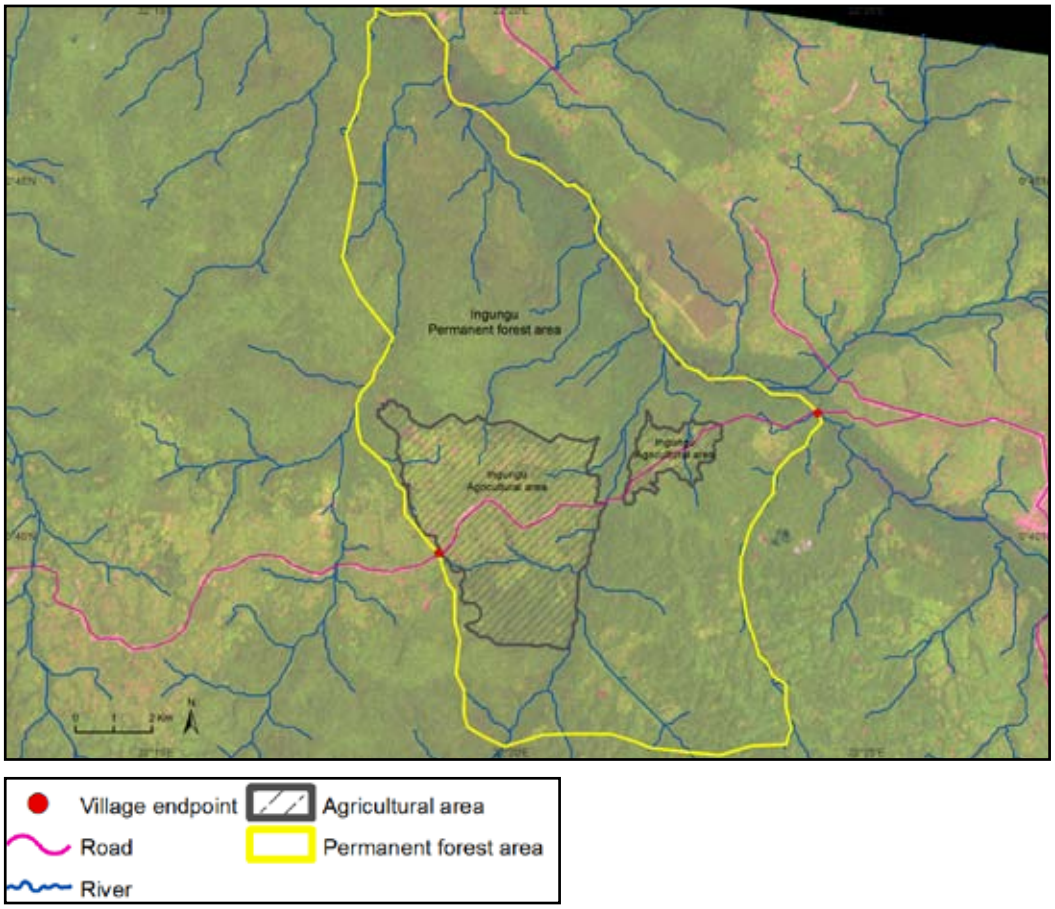

Figure 11.7: Result of a participative mapping process conducted in the Maringa-Lopori-Wamba Landscape
Source : MLW Consortium

Representatives of each village have signed an agreement with the MLW Consortium to respect the defined permanent and non-permanent forest boundaries in exchange for agricultural livelihood improvement within the non-permanent forest micro-zone. The community agrees not to expand their agricultural activities outside of the RDZ, therefore restricting conversion of forests in the permanent forest zone and protecting it for NTFP activities and forest habitat. In exchange, MLW Consortium partners provide technical and financial support to increase the productivity and diversity of agricultural production in the RDZ. With increased agricultural productivity inside this non-permanent forest zone, it is speculated that the amount of agricultural land needed to support the average household will either stay the same or decrease, even after taking population growth into account. Through a series of discussions and negotiations among the villages and the MLW Consortium, the limits and rules for further agricultural expansion can be negotiated.

Photo 11.10: Local communities learning about micro-zoning principles

Public Participation and Formal Recognition

Participative mapping and public participation provide the basis for MLW's micro-zoning activities. It is key that all levels of local society are represented both in the development of the agreements and in any decision-making processes related to the delimitation of the RDZ in the protected forest.

Local authorities at the district, territorial and sector level, as well as traditional authorities (representing the group authority level, for example), are involved in discussing the content of the agreements. Following traditional models, open negotiations are organized with the local communities with a focus on the participation of women. Based on these discussions, a draft protocol is then developed locally in French and Lingala with all members involved. It is the village chief who represents the village at signature of the agreement.

After discussion and negotiation with the local communities, the draft agreement is discussed and approved by the MLW Landscape Steering Committee in Kinshasa and validated subsequently by the group authorities as well as representatives of the localities of the different groups. Final agreements are signed in the presence of district and territorial authorities. The formal recognition of the results of the micro-zoning process requires equal involvement of authorities across local, provincial and national levels. It is the interactive participation at each level from local to national that assures the best outcome for the micro-zoning agreements and will eventually lead to the signature of an inter-ministerial declaration by MECNT and the Ministry of Agriculture.

To date, 27 villages have participated and agreed to this process. 21 villages have defined the limits of their RDZ and 4 of those villages have also defined the limits of their permanent CBNRM forest zone. In the coming months, the MLW mapping team will be working with the remaining villages to define the boundaries of the remaining permanent CBNRM forest zones.

Conclusion

At a time when large scale land use decisions are being heavily influenced by economic considerations and global demand for resources (e.g., large scale plantations, mining, forest management, infrastructure development, changing demographics), the importance of transparent and coordinated land use planning and forest zoning that incorporates participatory planning at the field level are paramount. Effective planning to respond to international, national, and local objectives and interests is an inherently complex and critical process for sustainable development.

Some may argue that new protected areas, timber concessions, mining permits, palm oil plantations, and community forests can be established in an *ad hoc* manner without any organized planning or zoning effort. However, forest management, biodiversity conservation, economic development, social equity and good governance are highly interdependent goals that must be approached simultaneously. Many of the problems encountered in the past with mining and timber concessions as well as protected areas can be avoided with a professional approach to planning rather than the sometimes haphazard and opportunistic approach of the past.

Increasingly, REDD national strategies across the region are highlighting land use planning to underpin the region's contributions to the mitigation of global climate change. This clearly is a positive development and if conducted properly can have ripple effects that transcend the climate challenge and result in lasting and sorely needed improvements in land management and economic development across the Congo Basin.

Photo 11.11: Flooded forest