

PROSPECTS FOR REDD+

Local Forest Management and Climate Change Mitigation in Burkina Faso

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Focali - Forest, Climate and Livelihood research network - is a Swedish knowledge-based network aiming to contribute to the provision of relevant knowledge to Sida and other Swedish authorities for the effective use of forest operations to reach climate and poverty objectives. Focali also aims to increase the flow of relevant information between academia, government authorities, and civil society.

Focali is a part of the **Forest Initiative** which is a strategic partnership between Sida, the Swedish Forest Agency and the Swedish Forestry Association. Sida provides funding for Focali. Focali currently consists of representatives from **University of Gothenburg**: Departments of Earth Sciences, Human and Economic Geography, Plant and Environmental Sciences, Economics, School of Global Studies; **Chalmers**: Division of Physical Resource Theory; **Linköping University**: Centre for Climate Science and Policy Research; **Swedish University of Agricultural Sciences**: Department of Forest Ecology and Management, Swedbio. The Focali secretariat is placed at **The Centre for Environment and Sustainability** (GMV) in Gothenburg, a network organization at Chalmers University of Technology and University of Gothenburg.

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The **Forest Initiative** is a strategic partnership between **Sida, the Swedish Forest Agency** and **the Swedish Forestry Association**. The overall objective of the Initiative is poverty reduction through promotion of sustainable management and administration of forest resources within Swedish development cooperation. Sida is the main donor of the Forest Initiative, which is based on the belief that forests play an important role for poor people and can contribute to economic and social development as well as a better environment.

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ABBREVIATIONS

AGB	Above ground biomass
CAF	Chantier d'Amenagement Forestière
FAO	Food and Agriculture Organization of the United Nations
FCFA	Franc Communauté financière d'Afrique (West African currency)
FIP	Forest Investment Program
GDP	Gross Domestic Product
GGF	Groupements de Gestion Forestière
GNI	Gross National Income'
ha	hectares
INSD	Institut national de la statistique et de la démographie
MECV	Ministère de l'Environnement et du Cadre de Vie
NAPA	National Adaptation Programme of Action
NTFP	Non-Timber Forest Product
ODA	Offical development assistance
REDD+	Reducing Emissions from Deforestation and Forest Degradation and conservation, sustainable management of forests and enhancement of carbon stocks
tC	tonnes of carbon
tCER	temporary Certified Emission Reductions
UGGF	Union des Groupements de Gestion Forestière
UNDP	United nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States' Dollars

SUMMARY

The Focali theme “Making REDD work for the poor” is interested in exploring the potential impacts of REDD+ on the livelihoods of poor people. REDD+ will be implemented in many different contexts and impacts on rural livelihoods will be very different, depending on local circumstances. We intend to conduct several studies, in different national and local contexts in order to get a broader picture of the potential impacts of REDD+. This report is a first step in our study of Burkina Faso. The purpose of the report is to provide an up-to-date overview of issues relating to forests and livelihoods in Burkina Faso, and to provide guidance in relation to the development of pro-poor REDD policies in the light of that overview. The two main parts of the report are a literature review of rural livelihoods literature in Burkina Faso from a REDD+ perspective and a local case study of a forest management area. The report concludes with a discussion of the implications of the report for future policy and research agendas.

Burkina Faso is one of eight pilot countries of the Forest Investment Program (FIP). Although the country’s forests have relatively low carbon content, there is hope that Burkina Faso can provide lessons learned to be replicated in other countries with tropical semi-arid lands. Burkina Faso is believed to have good institutional capacity for dealing with issues of rural development, forests and environment. However, our study indicates that the reality is not quite that simple.

Burkina Faso is one of the poorest countries in the world. Fifty-six point five percent of the population live on less than 1.25 USD per day and over 81% live on less than 2 USD per day (UNDP, 2009). Agricultural productivity is generally low. In the northern parts of the country, agriculture and other land-use activities are threatened by decreased rainfall and recurring droughts. Forestry is deemed one of the sectors most vulnerable to changes in climate because of its direct dependence on rainfall and temperature and its importance for the rural population as well as the country as a whole (Burkina Faso, 2007).

A threatened resource

The country has a low and declining forest cover. About 21% of the national territory is defined as forest (FAO, 2010a). In addition, trees are an important element on agricultural lands. Even the most conservative estimates suggest deforestation rates of about 0.2% a year (FAO, 2010b) while some calculations suggest it may be as high as 1.5% a year (Burkina Faso, 2007). The processes of deforestation are uneven (Wardell et al., 2003). While some forests are cut, other lands are abandoned or left fallow, allowing for regeneration of the tree cover. From a carbon point of view, forest degradation is also a great problem. It is caused by both natural factors, e.g. drought and by human-induced factors, such as livestock grazing, agricultural expansion and

intensification and fuelwood extraction. For many people these activities are the only source of income or sustenance.

Woodfuels are the most important energy source, constituting 85% of energy consumption (AGRECO, 2006). Several attempts have been made by the government and international donors to organise forest management in order to ensure a sustainable supply of woodfuels to the larger cities. The economic importance of woodfuel production is evident, both in our own case study in the Nazinon forest in wouthern Burkina Faso and in other available studies (MECV, 2004; Sawadogo, 2006). For those that participate in it, woodfuel production is an important source of income. This opens the opportunity for creating systems where forests are locally managed against conditional payments so as to conserve and enhance carbon stocks. However, it is imperative that such a system is created to avoid elite capture and corruption. This is why better understanding of existing benefit distribution systems related to forest management is crucial. Meanwhile, not all stakeholders in the forest are involved in forest management activities, and the design of a REDD+ system must take care not to disregard their interests.

Great expectations

Good local forest governance is often identified as key for reducing deforestation and forest degradation. One of the reasons why Burkina Faso became a pilot of the FIP is that forests are given a prominent role in the country's development strategy. The FIP Expert Group also points at the institutional capacity for dealing with issues of rural development, forests and environment in Burkina Faso. However, our findings from the Nazinon forest, show that local forest management groups are suffering from various problems. Cutting limits are systematically disregarded, large volumes of wood are never reported and taxed and there is corruption and embezzlement of money from both village development funds and forest management funds. Other studies have found that the market is controlled by transporters and wholesalers, at the expense of woodcutters (MECV, 2004; Sawadogo, 2006).

A rough calculation based on a generous estimation of deforestation, shows that even a complete halt of deforestation and forest degradation would not bring incomes large enough to significantly reduce poverty in the country. However, the rural population of Burkina Faso is very poor and even smaller economic contributions may make a difference in strained household economies. However, to be genuinely pro-poor, a REDD+ scheme must not limit the possibilities of using the forest for collection of non-timber forest products (NTFPs) and should ensure that livestock breeders are not expelled from the forests without compensation or alternative grazing opportunities.

In conclusion, Burkina Faso was chosen as a pilot in the FIP despite its relatively low mitigation potential with the justification that there is a great potential for reproducing successful efforts in the country to other countries with similar climate. Although we

have found substantial shortcomings in the Burkinian forest management system and institutional framework, it is likely that conditions are more favourable than in many other countries in the region, thereby making it a suitable pilot country. It is also important to remember that once REDD+ is fully implemented, it will be open to all countries with tropical forests, independent of their mitigation potential. It therefore makes sense to pilot REDD+ in a wide range of countries with varying institutional, environmental and economic conditions. This may make Burkina Faso an interesting country from a REDD+ perspective. However, it should be recalled that even including forest degradation its significance to the climate is limited.

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1 INTRODUCTION

Burkina Faso is one of the poorest countries in the world. Its small and declining forest cover has been estimated to approximately 21%. It is threatened by both natural and human factors. Deforestation and forest degradation in Burkina Faso is generally ascribed to livestock grazing, agricultural expansion and the demand for fuelwood. The vast majority of the population depends on woodfuels as the main source of energy. From a livelihoods perspective, woodfuel production is an important source of income for those that participate in it. This means that despite the low carbon content, REDD+ payments could possibly make a difference in the strained household economies of rural Burkina Faso. It opens the opportunity for creating systems where local forests are managed so as to conserve and enhance carbon stocks against conditional payments. However, it is imperative that such a system is created to avoid elite capture and corruption. This is why better understanding of existing benefit distribution systems related to forest management is crucial.

As the Forest Investment Program (FIP) is getting ready to invest in the country, it is crucial to increase the understanding of the relation between livelihoods and different land uses. In countries like Burkina Faso, where the value of forests is low, and productive agricultural land is growing scarce, this type of understanding is crucial if a REDD+ scheme (Reducing Emissions from Deforestation, Forest Degradation and conservation, sustainable management of forests and enhancement of carbon stocks) is to have any chance at succeeding. This understanding is also vital in order to design a REDD+ scheme which does not inadvertently deny poor people key livelihood activities (e.g. relating to NTFP (Non-Timber Forest Product) collection or to livestock grazing).

The Focali theme “Making REDD work for the poor” is interested in exploring the potential impacts of REDD+ on the livelihoods of poor people living in, by and/or of the forests where it is implemented. REDD+ will be implemented in many different context and impacts on rural livelihoods are likely to be very different, depending on local circumstances. We intend to conduct several studies, in different national and local contexts in order to get a broader picture of the potential impacts of REDD+. This report is a first step in our study of Burkina Faso. The purpose of the report is to provide an up-to-date overview of issues relating to forests and livelihoods in Burkina Faso, and to provide guidance in relation to the development of pro-poor REDD policies in the light of that overview. The report is the product of work that we have carried out during 2010, and we intend to use responses to it to inform our future engagement in Burkina Faso.

The report starts with a background, describing Burkina Faso, its forests and forest policies. The two main parts of the report are a review of rural livelihoods literature in Burkina Faso from a REDD+ perspective and secondly a local case study of a forest management area. The case study data was collected by Suvi Kokko during field work for her master’s thesis in Environmental Economics and Management. The report

concludes with a discussion of the implications of the report for future policy and research agendas.

2 BACKGROUND

Burkina Faso covers a landlocked area of 274 200 km² (MECV, 2004b). The country is divided in 13 regions (see Appendix 1 for map) and 45 provinces (see figure 1). It had a population of 14 million in the 2006 census, with a population growth rate over 3.4% (INSD, 2009a) so that by 2009 the population was estimated to be over 15 million (INSD, 2010). The population is comprised of over 60 ethnic groups (Zougouri, 2008). The largest group are the Mossi who make up over 40% of the total population (CIA, 2010). The larger groups in the remaining 60% include the Gurunsi, Senufo, Lobi, Bobo, Mande and Fulani.



Figure 1 Map of Burkina Faso (UN, 2004)¹

The population is overwhelmingly rural, with less than 23% living in urban areas (INSD, 2009a). Of the urban population, almost half lives in the capital, Ouagadougou. The country has a relatively young population, with 46% younger than fifteen years and less

¹ Reproduced with permission from the UN Cartographic Section.

than 4% of the population older than 65 (INSD, 2007). In 2007 the level of literacy was estimated at 28.3% among the population of age fifteen or older (INSD, 2007). The same number was 21% among women and 37% for men.

Burkina Faso is one of the poorest countries in the world. It is ranked 161st out of 169 countries in the Human Development Index by the UNDP (2010). Fifty-six point five percent live on less than 1.25 USD per day and over 81% live on less than 2 USD per day (UNDP, 2009). In 2008 the external debt stock was 21.2% of Gross National Income (GNI) (World Bank, 2010). Net official development assistance was 12.6% of GNI.

2.1 Economy

Burkina Faso suffers from a structural trade deficit (INSD, 2009b). In addition, since 2000, imports have grown at a larger rate than exports, further increasing the deficit. Exports of agricultural produce do not make up for the dependence on imported goods such as technical equipment and machinery, manufactured goods and fossil fuels. Raw materials, excluding fuels, comprised over 76% of Burkina Faso's exports in 2007 (INSD, 2009b). Cotton, in the form of fibres (not transformed into thread or tissue) accounted for over 60% of the exports. This makes Burkina very sensitive to fluctuations in the world market price of cotton. The subsidies provided to cotton producers in developed countries also pose a serious threat to Burkinian export revenues (INSD, 2009b). Oil seeds are the second largest export, accounting for almost 13%. Tobacco, fruits and vegetables and non-monetary gold (excluding gold ores and concentrates) account for about 2% each of exports. Vehicles account for 22% of total imports, followed by petroleum and petroleum products (17%) (INSD, 2009b).

Unfavourable climatic conditions, continuous soil degradation combined with financial and technological constraints render the country's agricultural sector one of the least productive on the African continent (Burkina Faso, 2007). Chronic drought and other extreme weather phenomena, among other factors, have catalysed a general environmental degradation and accelerated deforestation during the past decades. Nevertheless, agriculture and livestock breeding remain the most important economic activities, contributing the lion's share of Gross Domestic Product (GDP). The principal food crops produced are millet, sorghum, maize, rice, cereals, cowpea, yam, sweet potato and groundnut (INSD, 2009a). The major cash crops are cotton, groundnut, sesame and soy bean.

Only 44% of the population belong to the active population (everyone between 15 and 65 who is either in work or in search of work) (INSD, 2007). In rural areas the share is higher among women than men, but the reverse is true for urban areas. Only 7.5% of the occupied active population receive a salary (INSD, 2007). The majority are self-employed or work for family members. Among women the share that receives a salary is

even lower, at 3.8%, and women are employed by family members to a larger extent than men.

“Agriculture, hunting and forestry” occupy the vast majority of the active population, followed by the “commerce, crafts industry and reparation” sector which is dominated by commerce (INSD, 2007). Almost 80% of all households, and over 94% of rural households, practice agriculture and 70% of all households have at least one head of livestock. According to a survey conducted by the National Institute of Statistics (INSD) the primary sector, i.e. extraction or production of natural resources, occupied 67% of the active population in 2007 (INSD, 2007). However, the survey was carried out in the dry season when many farmers take other, seasonal jobs. As a comparison, the same survey conducted during the agricultural season in 2005 showed that 87% of the active population was occupied in the primary sector. The tertiary sector, i.e. services, occupied 25% of the active population in 2007 (12.5% in 2005) and the secondary sector, i.e. processing and manufacturing, occupied 8% (3% in 2005).

2.2 Forest landscapes

A large part of Burkina Faso is covered by trees (see figure 2). However, there are very few closed forests (with a canopy cover above 40%) (FAO, 2010b). Some closed forests remain in the southern parts of the country, but the northern part is mainly covered by thorn steppe. In its 2005 Forest Resources Assessment, FAO (2005) estimated that 25% of the national territory was covered by forests, amounting to 6.8 million hectares (ha). This number was adjusted in 2010 Forest Resources Assessment when the 2005 forest cover was estimated to 22% (FAO, 2010a). The same assessment estimated the 2010 forest cover to be 5.6 million ha, or 21%. There are no primary forests in the country, but the vast majority of the forests are naturally regenerated. Plantation forests, mainly eucalyptus used for fuelwood, were estimated to cover 76 000 ha in 2005 (FAO, 2010b). The Burkinian forests hold low above-ground biomass (AGB), hence terrestrial carbon, compared to the average for tropical forests in general (Westholm, 2010). Yet, accurate data on carbon stocks is hard to come by. According to the 2005 Forest Resources Assessment by the FAO, AGB carbon stock has declined by 20% between 1990 and 2005 (FAO, 2005). Also in tonnes of carbon per hectare of forest there was an almost 20% decrease during the same period. However, the results from the 2010 Forest Resources Assessment (FAO, 2010a), using a different methodology, concluded that the per hectare carbon stock in AGB had remained constant between 1990 and 2010, both in forests and other wooded land. The estimates are based on a forest inventory from 1978. According to the National Adaptation Programme of Action (NAPA) (Burkina Faso, 2007) forest biomass is expected to be reduced almost by half in the period 1999-2050.

Forest lands have suffered from extensive human encroachment. Estimations of annual deforestation vary between 15 000 ha/year (0.2%) (FAO, 2010b), 65 000 ha/year (1%) (FAO, 2010a), 80 000 ha/year (in 1992) (1.2%) (Ouégraogo, 2006) and 105 000 ha/year

(1.5%) (Burkina Faso, 2007). The discrepancies in numbers are likely due to differences in measurement periods, forest definitions and assessment methodologies. A study of land-use change in the Central West Region between 1986 and 2001 by Wardell et al. (2003) showed that while there was a gross-deforestation of 0.77% per annum during the period, net-deforestation was only 0.32% per annum. The reason for this was that although large areas were deforested, abandonment of farmland and long-term fallows allowed for regeneration of other lands. In consequence, deforestation is an uneven process, which means that aggregated national figures cannot reliably represent local processes nor vice versa (Wardell, et al., 2003). The Department of Forestry estimated that reforestation programmes reforested on average 5800 ha per year between 2001 and 2005 (INSD, 2009a).

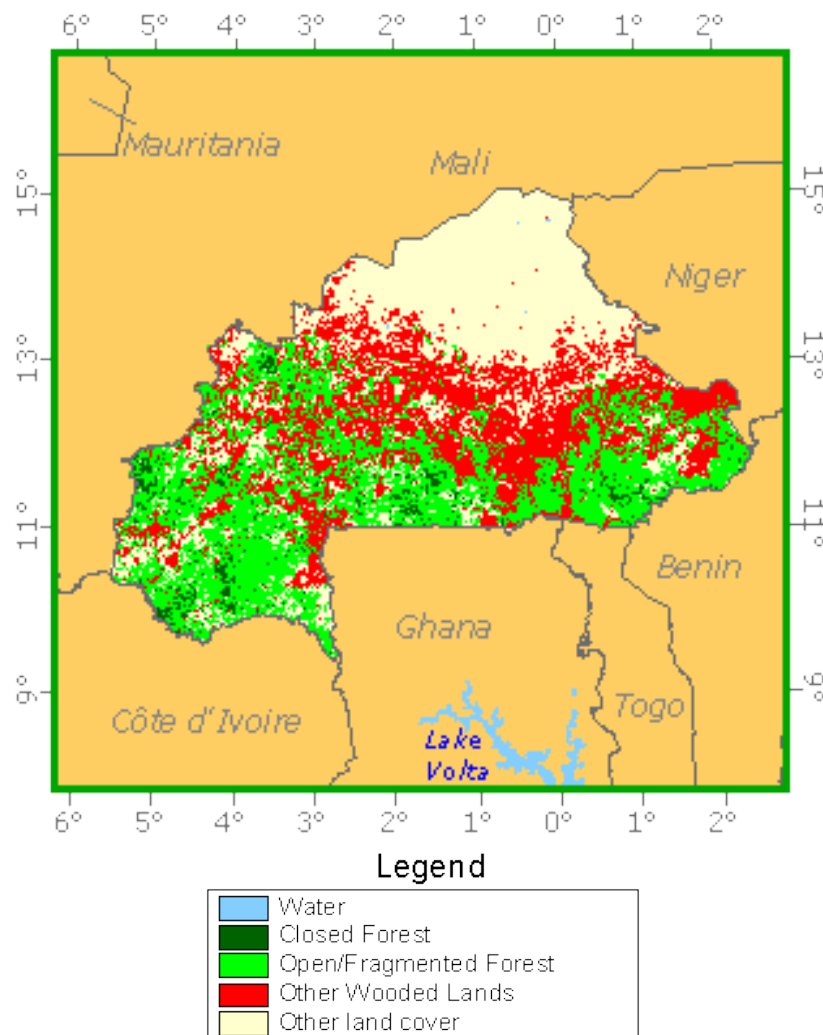


Figure 2 Burkina Faso forest cover according to FAO Forest Resources Assessment (FRA)² 2000 (FAO, 2008).

² **Forest** defined as area >0.5 ha with trees >5 m high and a canopy cover >10%, not including land predominantly under agricultural or urban use; **closed forest** canopy cover >40%; **open forest** canopy 10-40%;

A wooded land type that dominates the agricultural landscape and is common in Burkina Faso and all of Western Africa, is parkland. Parklands are landscapes with scattered mature trees, often interacting with crops cultivated underneath and animal husbandry, and/or used for NTPFs or wood. Depending on tree density, they may fall into the category other wooded lands and possibly also fragmented forests according to the FAO definition as displayed in figure 2. They are the predominant agroforestry system in West Africa and in Burkina Faso they are found throughout the country with the exception of the extreme North, East and Southwest where population density is low (Boffa, 1999). Tree species, density and management vary. Some parklands are created by cattle breeding farmers to ensure a sustained provision of fodder also in the dry season. Boffa (1999) finds a general agreement among researchers and practitioners as well as villager perceptions that tree densities in parklands have declined since the 1970s, although there is a lack of trustworthy and accurate data on the extent of this decrease. The difference between closed forest and parkland is exemplified in figure 3. However, tree density in both parklands and forests vary.



Figure 3 3a shows forest land of different ages. 3b shows parkland. (Photo: Suvi Kokko)

2.3 Forest institutions

2.3.1 Land classification

Burkina Faso's land resources are divided into "classified" and "protected"³ lands (MECV, 2004b). Classification is done either in the name of the state or in the name of decentralised local authorities (*collectivités territoriales décentralisées*) (Burkina Faso, 1997, Article 25). The classified lands, divided into classified forests, national parks and animal reserves (which cover by far the largest area) comprise 14% of the national territory (MECV, 2004b). The protected lands, which in 1980 covered 42% of the

fragmented forest means a mosaic of forest/non-forest with forest fraction 10-70%; **other wooded land** defined as lands not classified as forest, >0.5 ha with trees >5 m high and canopy cover of 5-10% (FAO, 1996, 2004).

³ Protected lands are sometimes referred to as "non-classified".

national territory, include the main forest lands of the country (MECV, 2004b). Classified and protected lands are distinguished from each other according to how they are managed. Classified lands are considered of particular importance and restrictions to their use, exploitation and management are specified in the classification act of each specific forest (Burkina Faso, 1997, Articles 26-29). Perhaps confusingly, the “protected” lands are less regulated and subject to the general rules for user rights and exploitation. All biosphere reserves, national parks, nature reserves and sanctuaries as well as forests of a size, ecological importance or aesthetic value that call for management beyond the means and capacities of local authorities, belong to the state (Burkina Faso, 1997, Articles 20-21).

Classified lands are remainders from the French colonial administration (Zougouri, 2008). A 1935 decree on forest classification declared that user rights only included extraction of dead wood, fruits and plants for food or medicinal use. Property rights and control over all other forest products and lands belonged exclusively to the state. Shifting cultivation, bush fires and extensive pastoralism were described as the “three evils”, leading to degradation of forest resources (Wardell et al., 2003). In 1984 a law was passed that gave the state ownership over all land, not only forests (Burkina Faso, 1984). Existing land titles were converted into usufruct titles and customary rights were no longer recognised. A decree from 1985 gives the public forest services exclusive rights to logging for fire wood or charcoal production (Burkina Faso, 1985). This was part of a strategy to combat desertification named the “three struggles” aimed to fight the three evils mentioned above (Ribot, 1999). However, during the 1980s classified forests were opened to surrounding populations through negotiations initiated by the state (Zougouri, 2008). The aim was to improve forest management as part of the state’s development agenda. Today, private ownership of forest lands does exist (Burkina Faso, 1997).

2.3.2 Decentralisation

The 1991 constitution established local authorities and meant the start of a decentralisation process that has been ongoing ever since (Bouda et al., 2009). Reforms began with the establishment of locally elected councils in urban municipalities. In 1998, the Orientation Texts on Decentralisation (“Textes d’Orientation de la Décentralisation”) were issued which formed the legal framework for the decentralisation process. The texts have been amended twice, eventually leading to the adoption of two types of communes; rural and urban. A rural commune has a minimum of 5000 inhabitants and an annual budget of 5 000 000 FCFA (10 000 USD) while an urban commune has a minimum of 25 000 inhabitants and an annual budget of 125 000 000 FCFA (255 000 USD). The National Commission for Decentralisation has identified two main objectives of the process; transfer of powers and resources to local governments and national agreement on a standard model for rural municipalities (Bouda et al., 2009). For many of the communes, natural resource exploitation is their only source of revenue, except for subsidies from the state, but Bouda et al. (2009) found that the laws giving rural

councils new powers are ineffective, leaving control over forest resources in the hands of foresters and businessmen.

2.3.3 Forest management

Since the 1980s there have been policies to promote sustainable forest management, including policies for participatory forest management aiming at including rural actors in the exploitation and sales of forests products and in conservation of forest resources (Zougouri, 2008). There are three forms of management for classified lands: management by the forest services in cooperation with the population; concessions to local authorities; and concessions to private actors. Forest management is based on a principle of voluntary participation by the population with technical supervision from the forest services (Sawadogo, 2006). In 1985 a system dividing forests into Forest Management Units (Chantier d'Aménagement Forestière, CAF) was established. This division was led by the FAO in a project called "Aménagement et exploitation des forêts pour le ravitaillement de Ouagadougou en bois de feu" (Forest management and exploitation for the supply of fuelwood to Ouagadougou) (Bellefontaine et al., 1997). Each CAF has a management plan which should outline a sustainable exploitation of the forest resources. Day to day forest management is delegated to villages, organised in management groups, called GGFs (Groupements de Gestion Forestière). The GGFs responsible for the management of a CAF are grouped in unions (so called UGGF). The UGGF signs a management contract for the CAF which gives them usufruct rights over the forest for the duration of the management plan. With the revenues from forest production, the UGGFs employ technical staff responsible for the implementation of the management plan.

In 1991, a new constitution embodying respect for 'customary' practices was adopted (Larson et al., 2010). It allows for management and use to be organised according to customary practice, but only permitted in as far as it does not contradict formal law. An amendment to the constitution attempting to harmonise formal law with customary law was made in 1997. This harmonisation was assisted by the decentralisation that started in 1996 and is still ongoing. The same practices recognised on classified lands by the 1935 decree are still recognised. In the Forest Code traditional user rights for forest exploitation in terms of gathering or collection are granted for satisfaction of domestic needs, but not for commercial exploitation (Burkina Faso, 1997, Articles 55-59). In classified forests traditional user rights granted to surrounding communities include collection of dead wood, fruit picking and harvesting of medicinal plants. On protected lands customary practices allowed are grazing and the collection of forest products and by-products. Traditional user rights are authorised in each local forest management plan.

The NAPA (National Adaptation Programme of Action) presented by Burkina Faso mentions some practices put in place in the forestry sector in order to tackle changes in climate (Burkina Faso, 2007). There are projects led by the government and/or

supported by international donors, on assisted regeneration, reforestation using domestic species, attempts to combat bushfires and illegal logging and delimitation and surveillance of community forests. The NAPA also mentions indigenous practices such as selective logging, commercialisation of firewood and increased exploitation of Non-Timber Forest Products (NTFPs). However, a strategy for mainstreaming adaptation into forest policies has not yet been defined (Kalame et al., 2009). So far these efforts to halt degradation and deforestation have had limited effect. The forest sector is dominated by informal activities (MECV, 2004a). This makes control and oversight difficult. The institutions in charge of implementing policies and strategies in the forests lack resources for efficiently executing this responsibility. According to the Ministry of Environment, enforcement is also made difficult because laws and regulations are not sufficiently disseminated and understood (MECV, 2004a). In contrast, Bouda et al. (2009) describe how law enforcement is often selective and laws misrepresented, enabling urban patrons and foresters to benefit from forests at the expense of forest-dwellers.

2.4 REDD+ in Burkina Faso

In March 2010, Burkina Faso was chosen as one of eight countries (together with Brazil, Democratic Republic of Congo, Ghana, Indonesia, Lao PDR, Mexico and Peru), to become pilots in the Forest Investment Program (FIP) (Saboia & Davies, 2010). The objective of the FIP is to support REDD+ efforts in developing countries, specifically through:

- a) initiating and facilitating transformational change in forest-related policies and practices;
- b) piloting replicable models for reducing emissions in the forest sector;
- c) facilitating the leveraging of additional financial resources for REDD+;
- d) providing experience and feedback to the UNFCCC deliberations on REDD+ (FIP, 2010b).

The criteria used for choosing countries were:

- i. potential to lead to significantly reduced emissions from deforestation and forest degradation;
- ii. potential to contribute to FIP objectives;
- iii. potential of mainstreaming FIP investments in ongoing policy framework;
- iv. country preparedness, ability and interest to undertake REDD+ efforts;
- v. distribution of countries across biomes and regions.

Among the pilot countries, Burkina Faso stands out as having by far the lowest estimated mitigation potential (FIP, 2010b). Nonetheless, the vast areas of tropical semi-arid lands make the potential for emissions reductions important, despite low per-hectare carbon content. Also, the FIP Expert Group put emphasis on the important role forests play for livelihoods in semi-arid ecosystems. This provides opportunities for

linking work to mitigate emissions with efforts on adaptation and reducing vulnerability in a way that is considered crucial in this type of ecosystem. Further, the Expert Group considers the potential for initiating transformational change in Burkina Faso to be significant (FIP, 2010b). They refer to the prominent role of forests in the country's development strategy and the institutional capacity for dealing with issues of rural development, forests and environment. The community forest management system is described as a successful effort that has led to sustainable resource exploitation. The FIP programmers see a potential for scaling up successful pilot projects in the forestry sector and promoting land-based mitigation activities, which are almost entirely absent in Burkina Faso.

The FIP counts on pledges amounting to 558 million USD (FIP, 2010a). Each country receives a 250 000 USD preparation grant for formulating an investment strategy. Further funding allocations have been decided according to countries' mitigation potential (which was given double weight) biodiversity potential, absorptive capacity and development benefits potential (Carrasco & Studart, 2010). Brazil and Indonesia received the highest ranking and will be granted 50-70 million USD. Burkina Faso (together with Lao PDR) received the lowest ranking and will be granted 20-30 million USD (taking into account the current level of funding) for implementation of the investment strategy. However, an investment strategy may program beyond this level of funding with the view to leveraging additional funding from other donors.

In Burkina Faso's statement of confirmation of participation in the FIP the country states as its priorities under the REDD+ program conservation and enhancement of carbon stocks through sustainable management of forest resources and valorisation of forest resources in the context of poverty reduction (Burkina Faso, 2010). This is to be achieved through, among other things, "rehabilitation of classified forests, through registration, reforestation/restocking, surveillance of forest exploitation, ecological monitoring;[...]creation of communal, community, and private forests through support of territorial collectives and local communities, encouragement and inclusion of the private sector in pursuit of sustainable exploitation, [...] and improvement of the productivity of income-generating species;[...]promotion of alternative and renewable energy sources other than fossil fuels, in order to ease pressure on forest resources (biofuels, solar energy, etc.);[...]recovery of degraded land in order to improve farm productivity and combat desertification" (Burkina Faso, 2010). The government plans to submit an Investment Strategy for endorsement by the FIP Sub-Committee by May 2011 (MECV, 2010). Two joint missions, with participation of all stakeholders, are planned during the first half of 2011 in order to support the process of developing the investment strategy (Climate Investment Funds, 2011).

3 THE ROLE OF FORESTS

The forestry sector plays an important role in Burkina Faso, economically, socially and culturally. It is difficult to estimate the real contribution the forest sector makes to the national economy because a large share of forest related activities take place in the informal sector. Agro pastoral and forestry activities have been estimated to occupy 86% of the active population and generate 40% of GDP (Burkina Faso, 2007). Approximately 60 000 people are formally employed in the forest sector (MECV, 2004a). This number includes woodcutters, woodfuel wholesalers, transporters and retailers. The formal forest sector contributes between 1.5% (FAO, 2010b) and 3% (MECV, 2004a) of GDP. However, in a report commissioned by the European Union (AGRECO, 2006) the contribution of forestry was estimated to be as much as 15.6% of GDP. The discrepancies in numbers, among other things, depend on what activities and goods are included in the forest sector and the methodologies for estimating their contribution to the economy.

3.1 Fuelwood production

For 97% of the population woodfuels are the main source of energy and firewood and charcoal constitute 85% of energy consumption (AGRECO, 2006). In 2007, fuelwood was used for cooking by as many as 95% of the rural households and 59% of the urban households (INSD, 2007). This demand is satisfied primarily from natural forests.

Studies have shown that revenues from forest exploitation contribute to the improvement of living standards, although improvements are often not enough to help households that receive them above the poverty line (Sawadogo, 2006). Households that are involved in fuelwood production to a greater extent own radios, bikes, motorcycles, as well as equipment that increases their agricultural productivity (MECV, 2004a). In 1998, a study carried out in the region of Ouagadougou found that households participating in forest management had an annual income over 80% higher than that of households that did not participate in forest management. Boukary Ouédraogo (2009) conducted a survey of woodfuel producers in eight forest management areas (CAFs) situated between 70 and 250 km from Ouagadougou. The average total yearly income of woodcutters was 166 000 FCFA (326 USD) which is a considerable amount considering that over 80% of the population lives on less than 2 USD per day. The differences between villages were large, both in terms of total income and distribution between sources of income, but the average distribution is displayed in figure 5:

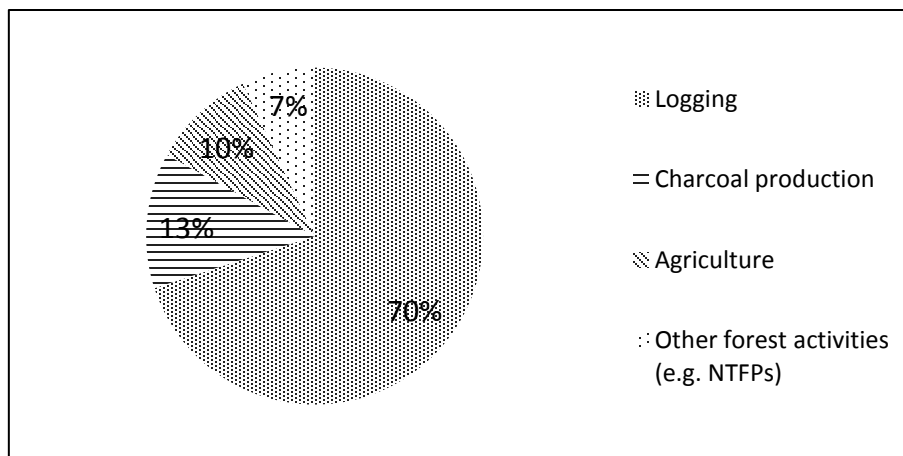


Figure 4 Average distribution of woodcutters' income sources. Source: B. Ouédraogo, 2009.

Nearly 90% of the members of the 225 GGFs in the Centre West region are men (Bouda et al., 2009). In a study in Sissili province, Coulibaly-Lingani et al. (2009) found that while commercial wood cutting is an activity mostly reserved for men, women and men have equal access to collection of fuelwood for household consumption since this is mainly a female responsibility.

Wholesalers of firewood pay 2200 FCFA (=4.3 USD) per stack of wood (1 m³) (B. Ouédraogo, 2009). About half of this sum, 900-1700 FCFA according to a report by the Environmental Ministry (MECV, 2004a), is payment to the woodcutter. 300 FCFA is a forest tax. 200-600 FCFA is paid in royalties to a forest management fund and is meant to be used for conserving the resource. Technical staff is financed by this fund. However studies have shown that the funds are not sufficient for sustaining management activities (B. Ouédraogo, 2009). Between 50 and 200 FCFA is designated working capital, paid to a village development fund, to be used for collective investments defined by the GGF. Table 1 shows the distribution of revenues from one m³ of wood.

	FCFA	USD	% of total
Payment to woodcutter	900-1700	1.8-3.5	41-72
Forest tax	300	0.6	14
Royalties to forest management fund	200-600	0.4-1.2	9-27
Village development fund	50-200	0.1-0.4	2-9
Total	2200	4.5	100

Table 1 Distribution of revenues from one m³ of wood. Source: B. Ouédraogo (2009), MECV (2004)

An analysis of the market for woodfuel in Ouagadougou showed that producers (some 46 000 people) receive 20% of total revenues, wholesalers (134 people) receive 50% while retailers (7000 people) receive 30% (Sawadogo, 2006). Although GGF unions have the legal right to set the price of fuelwood it is in practice the wholesalers, transporters

and forest officers that control the market (MECV, 2004a). This limits the revenues made by woodcutters. The forest sector is also constrained by forest management being focused mainly on producing woodfuels while NTFPs, although mentioned in the management plans, are not sufficiently taken into account (Sawadogo, 2006). In practice, management plans are oriented almost exclusively towards firewood production.

3.1.1 Woodfuel – burning the forest?

Boukary Ouédraogo (2006) calls Ouagadougou the “forest burner”, concluding that demand for woodfuels from the city is the main reason for the depletion of forest resources in the supply area of the capital (within a radius of 150 km from the city). The forest management zones only cover 15-17% of the total demand for firewood in Ouagadougou (B. Ouédraogo, 2009). On a national scale, forest management areas cover only 6% of woodfuel needs (MECV, 2004a). The remaining 94% come from non-managed forests where illegal exploitation, including logging without permit, excessive logging and logging of protected species, is common. This not only contributes to depletion of forest resources, but also means lost tax revenues that go into the pocket of woodfuel traders instead of to the state.

In the managed forests, the UGGFs are responsible for protecting forests against degradation. However, Bouda et al. (2009) found, in a study of forest management areas in the Centre West region that they often lack means for exercising their authority. This also leads to illegal cuts, unauthorised fires and infringement on forest lands by migrants and agro-businesses. Bouda et al. (2009) further observe that the process of creating UGGFs has failed in taking already existing local associations sufficiently into account. Also, Sawadogo (2006) points out that while the law intended to give UGGF and wood producers the power over forest resources, this has not happened, as wholesalers and transporters still control the market. As a consequence, wood cutting is considered by authorities as a marginal activity, yet responsible for forest degradation. Wood cutters, on the other side, may not have a choice since they depend for their subsistence on selling firewood.

As a counter-narrative to the notion of woodfuel demand as the driver of permanent deforestation, Wardell et al. (2003) show, in a study of the Central-West Region and areas supplying woodfuel to the city of Koudougou, that the opportunities for revenue-sharing may lead to a more stable forest cover. They find that control over forest resources in areas that supply cities with woodfuels may be more effective because forestry control has been more present and illegal users have traditionally been removed.

Ribot (1999) points out that forests in the Sahel actually do regenerate, even if they are unprotected. Although large amounts of forests are cut in order to provide cities with woodfuels, he finds no evidence that these forest clearings are permanent. In interviews, Ribot (1999) has found that charcoal makers return to the same areas for harvest after

9-12 years, and woodcutters return already after 4-7 years. He describes what he calls a “history of fear” where urban woodfuel demand has been identified by the colonial foresters, post-independence national Forest Services as well as contemporary international donors as the main cause of deforestation in West Africa. Throughout the 20th century, projections have foreseen the exhaustion of woodfuel resources in a relatively near future. In his analysis, Ribot describes the discourse of crisis in the woodfuel sector as highly profitable to forestry institutions and officials as it legitimises their control over and taxation of the market. In addition, the merchants who control production profit from the limited entry possibilities of competing producers.

3.1.2 Sustainable supply of woodfuels

The process of decentralisation, initiated in 1991, has worked slowly, but in 2004 the Ministry of Environment and the FAO started working on a plan to decentralise the forest sector (MECV, 2006). The primary goal of the government forest policies has been to provide the big cities of Ouagadougou and Bobo-Dioulasso with woodfuel (Sawadogo, 2006). But the objective is also to reduce pressure on forests by simultaneously increasing productivity of existing forest resources and substituting woodfuels with other sources of energy (Burkina Faso, 2001). This is partly to be achieved by electrification of rural areas, through improving connectivity with the electricity grid of neighbouring countries and taking advantage of the hydro-electric potential in the country. UNDP reported that almost 91% of the population lacked access to electricity in 2008 (UNDP, 2010). The electricity comes to a large extent from thermal power stations fuelled by fossil fuels and from neighbouring countries.

Efforts have been made to encourage the use of butane for cooking instead of woodfuels. However, gas as cooking fuel is mainly used in Ouagadougou and the Central region, especially among formal wage earners (INSD, 2007). The share of households using gas for cooking in 2007 was 25% of urban households and only 1.4% of rural households (INSD, 2007). Efforts to introduce improved stoves in order to reduce woodfuel demand have only had limited success. Between 2005 and 2007 the number of households using improved stoves decreased by half (INSD, 2007).

3.2 Non-Timber Forest Products (NTFPs)

Apart from serving as firewood, forests provide, among other things, timber, forage, honey, fruits and medicinal plants. These non-timber forest products (NTFPs) are often important to the poor population of dry forest areas (Wunder, 2001). Although no comprehensive data on the role of NTFPs in rural livelihoods is available, it is clear that they are important for diversifying incomes of rural households. They thereby mitigate risks of drought, crop loss or other unpredicted events (Coulibaly-Lingani et al., 2009). This potential is especially large in the south-eastern and south-western parts of the country, where for example the income-bringing karité tree (*Vitellaria paradoxa*) is common.

Women often have limited access to land and forest resources (Coulibaly-Lingani et al., 2009). They are discriminated against in traditional land inheritance practices (land is inherited from father to son). By contrast, women are often the main collectors and producers of NTFPs, so within the household NTFPs can provide women with control over a key source of income (B. Ouédraogo, 2009). Yet, female access to NTFPs also varies with the resource. For example Coulibaly-Lingani et al. (2009) found in their study in the Sissili region that men have exclusive access to the *néré* fruits (locust bean) in the forest.

The potential for commercialising NTFPs has not always been fully exploited. Where there is commercial exploitation, it is often on initiative from, and organised by, the technical direction of CAFs or women's village groups (B. Ouédraogo, 2009). It has been estimated that four million women are involved in the collection of fruit (MECV, 2004a). Less than half of the production is consumed domestically, and the rest is exported to Europe, thereby bringing the country substantial revenues. In 2003, export revenues from *karité* nut were estimated at 4 million USD by the Custom (MECV, 2004a). *Néré* grain or locust bean (*Parkia bioglobosa*) is produced mainly for the domestic and African markets. Just as with the shea nut, processing and sale of the locust bean are mainly female activities performed by rural women and women in the informal urban sector (Coulibaly-Lingani et al., 2009). This makes it difficult to estimate its economic value. It is nonetheless important (MECV, 2004a). Collection and processing of medicinal plants is another female-dominated activity (MECV, 2004a).

3.3 Agriculture and livestock farming

Agricultural expansion has become a threat to forests. Agricultural goods comprise more than 70% of Burkina Faso's total exports (WTO, 2009). Cotton is the main cash crop and Burkina Faso belongs to the major cotton exporters in the world (FAO, 2010c). Production grew rapidly during the 1990s, partly because of a government production plan (Sawadogo, 2006). This has led to cotton production expanding into new areas, especially in the eastern and south-western parts of the country. Between 1996 and 2006 the cultivated area dedicated to cotton more than tripled (INSD, 2009a). The expansion of cotton production poses a serious threat to Burkinabe forests according to the Ministry for Environment (MECV, 2004a). The threat is probably even greater to parklands. Kalame et al. (2009) point at the conflicting policy agendas between forest and agriculture ministries. In south-western Burkina Faso, farmers are encouraged to plant and maintain trees on their farmlands by the forest services. Yet, many choose instead to follow advice from agriculture agents to chop down trees to make way for cotton cultivation as this is more profitable.

Agricultural expansion is also closely linked to migration. In Sissili province, which has received large amounts of migrants since the 1980s, croplands have increased greatly at the expense of forests and woodland areas (Ouedraogo et al., 2010). It has even been

predicted that if migration continues unabated into the area it will run out of forests (Ouedraogo et al., 2009). In a study in the Sissili and Ziro provinces Paré et al. (2008) found a high rate of conversion to cropland relative to the national average. According to their findings, this led to degradation of the Sissili protected forest and an increase of illegal activities in the forest.

Sawadogo (2006) suggests that the pressure on forests from agricultural expansion could be reduced by increasing productivity in agriculture. However, farmers are often poor, with limited resources for investing in technological improvement, which makes them more prone to expanding croplands in order to meet needs for increased production (Ouedraogo et al., 2010). In addition, the expanded cultivation of cotton and other cash crops e.g. maize, has led to a combination of agricultural expansion and intensification (Gray, 2005). Gray finds that the spread of cotton and maize cultivation in southwestern Burkina Faso has led to adoption of new production techniques with increased use of inputs and animal traction. This has led to both the conversion of forests to farmland and to fewer trees being left on the fields since these are not compatible with animal traction. The study shows that poorer farmers are less prone to using animal traction and have more trees on their farmlands.

Livestock breeding and grazing is another important cause of degradation in classified forests (Dulbecco & Yelkouni, 2007). Livestock is Burkina Faso's second largest export, after cotton, and it contributes 12% of GDP (MECV, 2004a). Livestock breeding is generally practiced extensively or as transhumance. Apart from grass, animals eat leaves, flowers and fruits. About 35% of all forage comes from forests. In areas where the density of cattle is high fodder trees may be threatened by excessive pruning as reported by Paré et al. (2008).

3.4 Land tenure

Most literature on tenure rights and tenure security in Burkina Faso focuses on farm land tenure. Although land is officially considered state property and customary land rights are not recognized by law, local communities generally do not recognize state ownership (Coulibaly-Lingani et al., 2009). They regard themselves as owners of the land. According to Brasselle et al. (2002) the state only claims ownership over those *"rural lands for which no individual has claimed exclusive property rights and explicitly required titling"*. Yet, in their study not a single household has filed for titling under the formal system. Dulbecco and Yelkouni (2007) found that farmers who use forest resources in the Tiogo Forest do so according to traditional social rules, unaware of formal laws. Farmers rarely acquire land through commercial transactions (R. S. Ouédraogo et al., 1996). Instead, land is inherited from father to son, or borrowed, often on a long-term or permanent basis (Gray & Kevane, 2001; R. S. Ouédraogo et al., 1996). The owner is usually compensated for the loan of land with a symbolic gift.

Sawadogo (2006) identifies insecure tenure rights as the greatest threat to the survival of the forest management units (CAFs). Insecurity may encourage a short-term, non-sustainable perspective on resource management (Coulibaly-Lingani et al., 2009). Borrowed land is rarely reclaimed unless left fallow, meaning that there is reluctance to do so. Further, there may be restrictions on the practices allowed on borrowed lands. For example, in southern Burkina Faso, Coulibaly-Lingany et al. (2009) report that migrants and women are not allowed to plant trees because this is a way of claiming land. This is probably true for many parts of the country. A study on participation in forest conservation and sustainable management of forests in the Kaboré Tambi National Park found that more secure land rights increase the probability of choosing sustainable forest management practices (Brännlund et al., 2009).

3.5 Migration

According to a survey from 1994, 28% of the total Burkinabè population had migrated at some point in their life (Burkina Faso, 2001). Fifty-four percent of the migrants were women. In Burkina's National Communication to the UNFCCC (Burkina Faso, 2001) migration is divided into three types; international migration, 'the rural exodus' (rural to urban migration in-country) and 'rural migration' (rural to rural migration in-country). International migration goes to a large extent to Côte d'Ivoire. Emigrants are mainly young men. In recent years however, migrants have been returning from Côte d'Ivoire because of the socio-political crisis in the country (Chauveau et al., 2006). According to the National Communication (Burkina Faso, 2001) the declining number of Burkinabès living abroad, is partly due to a political call from the regime to return and rebuild the country, and partly because of police harassment suffered by many Burkinabès abroad. In 2007, remittances contributed 0.7% of GDP or 3 USD per capita (UNDP, 2009). Over 90% of remittances came from within the African continent.

The "rural exodus", to a large extent driven by the search for employment (mainly in Ouagadougou, Bobo-Dioulasso, Koudougou, Kaya and Dédougou), has caused overexploitation and deforestation around the major cities. However, while the process of urbanisation is prominent, the most common destination for migrants from rural areas is not the city, but rather other rural areas (Henry et al., 2004). Rural migration is generally away from infertile regions afflicted by food insecurity. Frequent droughts have spurred migration from the north and the Plateau Central to the western and southern parts of the country resulting in increased competition over, and degradation of natural resources in these parts. Migration goes mainly to the provinces of Sissili, Ziro, Kossi, Banwa, Mouhoun, Balé, Comoé, Léraba, Gnagna, Kompienga and Komandjoari⁴ (Sawadogo, 2006). Generally, this represents a movement of people towards the parts of the country where there are most forests and parkland landscapes.

⁴ See map on page 13

Migration is often seen as a threat to forest. There is a risk that migration spurs overexploitation of resources in the receiving regions. This is for example observed by Paré (2008) in Ziro and Sissili provinces. According to Paré, between 1986 and 2002, croplands increased in the two provinces at the expense of forestlands, gallery forests and grazing lands, largely due to the influx of population. Wardell et al. (2003), however, found no relation between loss of forest cover and population pressure in their study of land-use change in the Central-West Region. Another possible relationship between migration and pressure on forests is that migrants often have weak tenure rights which may make them less motivated to take care of the forests (see previous section). It has also been observed that migrants tend to have larger croplands than indigenous farmers (Ouedraogo et al., 2009). This may be because indigenous farmers have long-term experience and tradition of adapting to the environment in the region and have a more diverse income base, while migrants are more set on securing food and income and often to also sustain or assist families left behind in their home region.

3.6 Rural livelihoods and forest management - conclusions

Deforestation patterns vary greatly across Burkina Faso. While some forests are cut, other lands are abandoned or left fallowed, allowing for regeneration of the tree cover. What works as a driver of deforestation in one region may not have the same impact somewhere else. The drivers described above do not automatically lead to deforestation. Rather, their impact on forests is a result of the political, economic and legal-institutional context within which they exist. Also the physical environment is important. For example Wardell et al. (2003) describe how forest corridors in river valleys have remained intact because of the occurrence of vector diseases such as sleeping sickness and river blindness in these areas.

Burkina Faso was chosen as one of eight pilot countries of the Forest Investment Program (FIP). Although the estimated mitigation potential in the country is low, there is hope that Burkina Faso can provide lessons learned to be applied in other countries with tropical semi-arid lands. One of the reasons why Burkina Faso became a pilot of the FIP is that forests are given a prominent role in the country's development strategy. The FIP Expert Group also points at the institutional capacity for dealing with issues of rural development, forests and environment. Good local forest governance is often the focus of discussions on how to reduce deforestation and forest degradation.

Yet, while several researchers and articles (Bouda, et al., 2009; B. Ouédraogo, 2009; Sawadogo, 2006) have described the structure of the forest management system and its value chain, we were not able to find any local studies of how forest management works in practice. It is often mentioned in passing that woodcutters are prey to the influence of wholesalers and transporters who are able to control prices for fuel. However, there seems to be little current information about how CAFs are functioning and how their functioning relates to the operation of the fuelwood value chain. Also, whilst the

literature clearly indicates widespread use of NTFPs for both household consumption and trading it is not clear how important a part NTFPs play in household livelihoods, nor how large a potential role they might play under alternative forest management scenarios. Clearer empirical evidence on this will be crucial for estimating the potential poverty reduction effects of avoided deforestation and other REDD+ activities.

As a first step to fill the gap of knowledge in the local forest management field, we conducted a short, initial study of local forest management in three villages in the Nazinon forest in southern Burkina Faso. The Nazinon forest has been identified by the Forest Department as exemplifying good local forest governance and therefore as potentially suitable for REDD+ implementation. The results of that case study are presented in the next section.

4 FOREST MANAGEMENT AND BENEFIT SHARING – A LOCAL CASE STUDY⁵

In May-June 2010 we undertook at fieldwork with the purpose of learning more about the current situation regarding livelihoods and local forest management. This study took place in the forest management unit (CAF) of the Nazinon forest, in the province of Ziro located 70 km south of Ouagadougou. The Nazinon forest was identified by representatives from the Forest Department as a well-functioning and established management area with potential for REDD+ implementation. The forest straddles an area of 32 000 ha, of which 23 700 ha are included in the CAF. The study area, and the three villages Bawiga, Gallo and Nadono, were chosen with guidance from the National Forest Department. According to the Director of Forests, Mr. Doulkom, the Nazinon forest was seen as a potential pilot area for REDD+, as it is a CAF with a long history of local management and is considered to function rather well.

The villages each have between 2000 and 3000 inhabitants. All villages are located in an ethnically Gurunsi area, although in Gallo, Mossi are in the majority. The villages depend on a similar set of economic activities, mainly agricultural production of sorghum, millet, groundnut and maize and forest exploitation. However Gallo, which is located on the main road, has a more diversified economy. Bawiga is the poorest village of the three, with smaller cultivated areas and lower wood production than the other two.

Field data was collected through formal interviews, field observations and informal interaction with people in the three villages. To the extent possible, efforts were made to cover a variety of perspectives, including different social and ethnic groups, both indigenous people and migrants and both relatives and non-relatives of the village chief. The study consisted of 38 individual interviews (9 in Bawiga, 12 in Gallo and 16 in Nadono), including a total of 24 people who reported being active as woodcutters. In addition, two focus groups with mostly wood-cutting men and two focus groups with women who exploit NTFPs were conducted. The interviews were semi-structured with open-ended questions. Observations were used for studying the status of forests, cutting techniques, working conditions and also to validate information provided in the interviews. New questions were also raised from the observations.

4.1 Woodcutting

The Nazinon CAF consists of 25 villages organised in 25 forest management cooperatives (GGFs), together forming a union of forest management groups (UGGF). The CAF was initially founded in 1985 as part of a UNDP and FAO project, but in 1995 FAO transferred responsibility to the UGGF. The Nazinon forest is divided into eight

⁵ A more comprehensive account of the study is presented in the thesis “*Local Forest Governance and Benefit Sharing from Reduced Emissions from Deforestation and Forest Degradation (REDD)*” (Kokko, 2010).

management units of 2000-4000 hectares each, each of which is managed by two to three GGFs. Each management unit is divided into 20 plots. According to the UGGF regulations, cutting is only allowed during the dry season according to a rotation system and every year only 50% of one plot can be selectively cut, starting with low-value trees.

4.1.1 Organisation of woodcutting

Each village has a GGF office with a president, a secretary and a treasurer. Membership of the GGF is voluntary and open to any villager. In practice it is unusual for women to be members, and in the three case study villages there are no female members. GGF membership provides access to income from woodcutting and to credit through the GGF village development fund. Members of the GGF participate in decision-making and have the right to express their opinion at meetings and to be informed of decisions taken. The GGF office does not have the power to make decisions on its own and it cannot withdraw money from the village development fund without approval from the members.

The interviewees in Bawiga and Nadono generally consider the activities and responsibilities of the GGF to be conducted in an equitable way and with transparency. In Gallo, opinions vary. At the end of the year the UGGF organises a general meeting with representatives from all the GGFs in order to inform them about the activities of the past year and to plan the coming year. These yearly meetings allow the exchange of opinions between the villages that form the UGGF.

The GGF is responsible for and organises the work in the forest, but woodcutters are not formally employed. They perform their work individually, sometimes with the help of a partner or a family member. Non-members may ask to participate in woodcutting if they are in need of cash. Among the non-members occasionally practicing woodcutting are some 20 women. New members of the GGF receive training in sustainable woodcutting and regenerative techniques. In all three villages the woodcutters are well aware of the rules and regulations concerning the community forest. Each village has two to four people who make surveillance rounds in the forest to monitor any illegal activity. As payment, they are compensated for the wear in the tyres of their motorcycles. The President of the GGF, chief of the unit CAF, is formally responsible for surveillance. In addition, the village chief is responsible for performing customary rites to protect the forests. Non-compliance with the customary rules is believed to lead to severe punishments and even death.

When cutting is finished the wood is collected and stacked. The quantity is estimated and trucks called in to collect the wood. Woodcutters are then given seeds to plant in order to reforest the newly cut area. According to official regulations the trucks that transport wood to Ouagadougou and other cities can be loaded with a maximum of 20 m³ of wood. The woodcutters in our study receive payments for this amount in the village of Gallo twice a week, under the supervision of the UGGF. The woodcutter is paid 1100 FCFA per m³ or 22 000 for a full truck load. In addition, the merchant pays taxes

and fees to the forest management fund belonging to the UGGF and to the village development fund belonging to the GGF. These payments are all administered by the UGGF.

In practice, trucks are usually overloaded and the loading regulations are not respected. Trucks may be loaded with as much as 30-40 m³. Figure 6 shows an overloaded truck. The overload is not declared with the UGGF in Gallo, and no charges are paid for it. Instead, the woodcutter negotiates a price with the truck driver and the amount above the 22 000 FCFA received at the UGGF office is paid directly in the forest. The overload can pay 15 000-20 000 FCFA extra. For the woodcutters, this is a way of securing an income and mitigating the risk of delayed payment in case the truck gets stuck in the mud on its way to Gallo. The wood exceeding 20 m³ does not always arrive at the wholesaler. Instead the truck drivers sell the wood on their way to Ouagadougou. Woodcutters say that they must monitor the loading of the trucks carefully in order not to get fooled by the truck drivers.



Figure 5 Truck drivers and woodcutters in Gallo repairing overloaded truck (Photo: Suvi Kokko)

In addition to woodcutting, the GGFs may have other collective activities. In Bawiga for example, the GGF has a two hectare field for production of beans, maize and groundnut. The field is cultivated by the women who participate in woodcutting. The production is sold to finance the village development fund. In Gallo, millet and red and white sorghum are cultivated on the GGF's common field. There is also a eucalyptus field managed by the members of the GGF.

4.1.2 Woodcutting and livelihoods

Agriculture is the main economic activity in all three villages, but woodcutting is an important complementary activity as it generates important cash revenue. It provides an important source of income during the dry period when there is no other income generating activity. It is especially considered an important source for financing pre-natal care for pregnant women. Incomes from woodcutting also help covering travel expenses, pay for children's education, clothes and traditional ceremonies or serve as a buffer for unexpected expenses in case of illness or lost harvest. In addition, it is an important resource for productive investments. The woodcutters in our study have bought animals as well as motorcycles with the money from woodfuel sales.

In general the woodcutters report that they would prefer not to cut wood, and would rather concentrate on agriculture and cattle raising activities. Despite the benefits, woodcutting is hard work and few enjoy it. It is seen as a low-status job. Woodcutters usually look for other occupations such as cattle breeding when they grow older and tired. All the 24 individually interviewed woodcutters in our study expressed a wish to concentrate on agriculture, but considered woodcutting a necessary side activity due to the limited agricultural productivity. Woodcutting creates jobs, especially in Bawiga and Nadono. Many young men used to migrate to Côte d'Ivoire to work on plantations, but with the income from woodcutting they do not see the need to continue to do so. Rather, they can stay and work in the village.

There are also non-monetary benefits from the organisation of GGFs. At community level, governance was reported to have improved. Interviewees express the view that villages are managed in a more participative manner. Before the existence of the GGF, there were no general consultations for facing problems or making decisions that affected the whole village. The GGF activity has taught people to listen to others as well as to help not only the members, but all the inhabitants of the villages to organise themselves when facing a problem. A woodcutter in Nadono said that for him, what is important with the GGF is unity and that there is solidarity among the members. According to another interviewee from Nadono the villages managing the forest together have become friendlier with each other.

4.1.3 Village development funds

According to regulations, the village development fund, also called the working capital fund, should receive 200 FCFA per m³ of wood. However, in the case study villages each truck of wood pays between 500 and 1500 FCFA (on average 50 FCFA/m³) to the fund. In one village woodcutters say that only 10 FCFA per m³ goes to the village development fund. The village development funds were initially managed by the villages themselves, but as the funds grew it was decided that they would be transferred to the UGGF in Gallo. There they are managed by the president and the technical director of the UGGF and only the UGGF sales delegate (Commis de commercialisations) has access to them. A

request for money must be made to them. If the request is approved, two representatives of the GGF collect it.

The village development funds have financed the construction of schools, a mosque, a healthcare centre and wells and they finance the often needed repairs of wells. Members may also apply for loans from the fund in case of illness or other unexpected events preventing them from working. Woodcutters can also ask for loans for buying tools in the beginning of the season. These are then deducted from wood payments. If the loan taker is not able to repay the loan, the members discuss the situation and together decide whether to convert it into a donation. Also elderly people that are no longer capable of cutting wood benefit from the funds.

However, many interviewees reported irregularities and embezzlement. They complained that they lost control over the funds when they were transferred to the UGGF. The UGGF controlled bookkeeping and none of the interviewees in the villages knew how large the funds were. Requests for money, especially for larger investments were often turned down on the grounds of a lack of money. Interviewees said that no big investments had been made since the 1990s. Most grants from the funds nowadays were smaller grants to cover individual needs.

4.1.4 Forest management funds

For every cubic metre of wood sold and declared at the UGGF office in Gallo, 600 FCFA is paid to a forest management fund, managed by the UGGF. This fund is meant to be used for productive investments but many of our interviewees complained that this was not the case. For example woodcutters had understood that they would be provided carts for transporting wood free of charge, but in the end they were charged 75 000 FCFA which was deducted from the wood payments. Yet, a delegate from the UGGF stated that the village development fund of Gallo had funded the carts of the Gallo GGF. Another example is that the GGFs had requested that the UGGF use money from the fund to repair the roads. Money from the fund is meant to be used for this purpose, among others, and the woodcutters have especially requested that it be done. The bad shape and long-term deterioration of the roads is a big problem. It may take days for the trucks to get out of the forest, leaving the woodcutters waiting for payment and losing time they could have spent on agricultural activities. The UGGF says to the woodcutters that the amount of wood produced is not enough to repair the roads. Some villagers think that there is a problem in the management of the forest management fund rather than an insufficient wood production. According to some woodcutters part of the money has been used to buy trucks for transporting wood instead of repairing the roads.

There is a general discontent with the UGGF in all three villages. The lack of transparency and a history of embezzlement have caused great suspicion towards the UGGF. The UGGF is powerful and the woodcutters depend on it. This makes it difficult for woodcutters to demand their rights and influence their situation. However, they

blame the people managing the organisation rather than the organisation per se for its malfunctioning. The representatives of the UGGF have held their positions for over 20 years. Many interviewees express a wish to return to the time when the project started and was well functioning and for the UGGF representatives to be replaced. However, this is not easy to do. As one man put it: *“We would not dream of it, the chief of the union is untouchable, during over 20 years he has grown roots, if you try to ‘uproot’ him you will fall, not him”*.

4.1.5 Illegal activities

It is illegal to cut green wood and make fires in the forest during certain periods. Uprooting trees and poaching are also illegal. According to the majority of the interviewees illegal activities in the forest are rare. Yet, in all three GGFs there are reports of illegal activities and an increasing lack of respect for regulations. This was confirmed by observations in the forest on a newly cut plot. The rules say that 50% of cutting standard sized trees on a plot must be left untouched. However, on the observation plot there were only five nearly fully sized trees and 26 stumps. On the plot intended for harvest next year, which had not been touched for 20 years, most trees did not meet the size requirements for harvest.

There are also reports of charcoal producers encroaching on the forest, cutting trees left for regeneration. The charcoal producers are normally people unknown to the GGFs and they are not informed about their activity. They have not been able to catch the people illegally producing charcoal. According to many of the interviewees organisation was perfect when the “white man” managed the forest, i.e. when the FAO was in charge; management was stricter, whereas now there is only disorder. Control over the forest has decreased and people cut outside the defined periods and on plots that are not yet meant to be cut.

Yet, once a month unit chiefs gather in Gallo to make rounds in the forest. Rounds are also made by members of the GGFs to see if there are people cutting outside the defined zone. When illegal activity is encountered the unit chief informs the UGGF, who then takes action. The most common sanction for illegal cutting is confiscation of the wood and fines. The money from confiscated wood goes to the village development fund. It seems the confiscation of wood has decreased illegal cutting. The most severe sanction is imprisonment. Also members of the GGF have been known to cut wood illegally. They may remain members if they promise not to repeat the infraction.

4.1.6 Future of woodcutting

Organised forest exploitation is a rather new activity in the region. Many woodcutters say that their parents did not cut wood whereas nowadays a great number of people do so. Most woodcutters are concerned about the future. Compared to the past 20 years, they are no longer able to cut the same quality and quantity of wood. In the long term

the woodcutting business as a whole is threatened. According to an interviewee in Bawiga there are more people using the forests than 20 years ago, but less wood. This makes people look for other income-generating activities. In Nadono the woodcutters experience a decrease in productivity as trees are smaller and the quantity of dry wood has decreased. Many are worried about how they will make a living in the future. There is a wish to enlarge the plots of their units in order to exploit greater quantities of wood.

Regeneration of the forest does occur. There are cutting techniques aimed at promoting regeneration. However regeneration is slow and there is no time to wait for the trees to grow to a sufficient size. Many woodcutters would prefer not to cut the forest and instead expand and intensify agricultural production, but they need water for this. There is a need for other dry season activities. In Nadono the woodcutters have tried to build a water reservoir, but due to the lack of technical experience the construction was not solid enough. In Bawiga the GGF has started to train the woodcutters in exploitation of grass to produce melting pits (fosses fondues) where grass is decomposed and can then be sold.

4.2 Other forest actors

4.2.1 Women's forest activities

Women are not members of the GGFs in Bawiga, Gallo and Nadono. Nevertheless women also depend on the forest for their income during the dry season. Income from agriculture has decreased with decreasing rainfall and this has forced women to diversify. Due to the physical nature of woodcutting and the distance to the forest many women prefer to exploit NTFPs. However, the products they collect are heavy and the women have to carry them on their heads. It is also difficult to bring food and water to the forest. In addition there is competition with animals, especially elephants, which eat nuts and also destroy trees.

In Bawiga, 37 women are organised in a cooperative producing shea butter and soumbala (a spice made from the fermented nére fruit/locust bean). The money from the sales goes into a cooperative fund. In addition to NTFPs the women's cooperative grows groundnut on a common field. The fund finances fertiliser, pesticides and labour. The women's cooperative has also provided financing for building and repairing village wells. At individual level the women use the money from their cooperative activities for buying animals or to pay for their children's college education. The cooperative also provides credits for individual use e.g. buying pigs or food. The main forest activities of the women from Nadono are woodcutting, collection of detarium fruit and shea nuts and seed production. They sell seeds to the UGGF. However, the income from selling seeds is insecure. Price setting is in the hands of the Technical Direction of the UGGF and prices are set only when seeds from all the villages have been collected.

4.2.2 The Fulani

The Fulani are a cattle raising nomad ethnic group that has become more or less permanently settled in the outskirts of the villages. The forest plays an important role in the livelihoods of the Fulani as grazing ground for their animals, providing them with a constant supply of forage. They sometimes cut wood when they are in urgent need of money. However, they are not members of the GGFs because cattle herding, not woodcutting, is their main activity. They do not receive financial aid from the GGF, but rather rely on friends or sell animals to solve financial problems.

If a cow enters a classified forest, it is confiscated and the Fulani must pay a high fine. Therefore they graze in the protected forest belonging to the GGFs to avoid problems. In general there are no conflicts with the GGFs. However, during winter or the dry season when there is not enough forage, the Fulani are forced to cut branches off trees. If they are caught, they have to pay a fine of between 50 000 and 250 000 FCFA. Sometimes it is enough for a Fulani to be found with a knife in the forest, for it to be confiscated, although the knife may be needed for e.g. killing a suffering animal.

4.3 Forest management and livelihoods in the Nazinon CAF - conclusions

In most literature on forests in Burkina Faso, deforestation and forest degradation are attributed to woodfuel extraction, in combination with agricultural expansion, livestock grazing and other anthropogenic and natural causes. The vast majority of the population depends on woodfuels as the main source of energy. A system for local forest management has been established in an attempt to ensure a sustainable provision of woodfuels to the major cities. However, the locally managed forests only supply a small share of the wood demanded in cities like Ouagadougou. The rest comes from illegally logged forests or uncontrolled forest production. Several authors have identified this as a large threat to forests (MECV, 2004a; B. Ouédraogo, 2009; Ouégraogo, 2006). A different picture is provided by Jesse Ribot (1999) who challenges the view that woodfuel demand is a major cause of permanent deforestation.

Our case study shows that the management of local forest management groups (GGFs) is suffering from various problems. Cutting limits are systematically disregarded and large volumes of wood are never reported and taxed. Observations in the forest indicated that the outtake of wood exceeded the sustainable level. Our evidence thus reveals that although woodcutting for fuel provision has not lead to permanent deforestation, it is causing of forest degradation.

Further, our interviewees spoke about corruption and embezzlement of money from both village development funds and forest management funds. With the likelihood of REDD+ being implemented in Burkina, it is imperative that the system is designed to avoid elite capture and corruption. The FIP Expert Group described the system for local forest management as a success that should be scaled up and mainstreamed in its report

on recommendations for pilots under the FIP (FIP, 2010b). The National Forest Department described the Nazinon forest as a positive example. The results from our case study are not quite as rosy. It seems there is a lack of knowledge of the reality of local forest management. Better understanding of existing benefit distribution systems related to forest management is needed.

From our findings we conclude that the economic contribution of fuelwood production to rural households is less than it could be if the market was not controlled by transporters and wholesalers, rather than woodcutters (as intended when the system was established) (MECV, 2004a; Sawadogo, 2006). Yet it is not negligible. The incomes from woodcutting serve as a way of diversifying incomes. Rural livelihoods in Burkina Faso are highly dependent on rainfed agriculture. Non-farm activities are important as a means to make up for reduced farm productivity, especially as climatic changes become more pronounced (Assan et al., 2009). Woodcutting has also allowed young men to stay at home rather than to migrate to earn additional incomes. The village development funds seem to serve as an insurance against unexpected expenses.

5 CONCLUSIONS

The aim of this paper has been to provide an overview of the forest situation in Burkina Faso and how it relates to rural livelihoods. It has been informed by a comprehensive review of relevant literature, and local field work in an area considered by forest authorities to exemplify relatively good governance. Below is a discussion based on our findings.

5.1 Discussion

Deforestation in Burkina Faso is relatively large, although it is difficult to find reliable and concordant numbers. Also, the processes of deforestation are uneven (Wardell et al., 2003). While forests may be lost in some areas, they may be allowed to regrow or regenerate in others. This makes aggregated national figures unsuitable for describing local situations and vice versa. In total however, the forest cover in Burkina Faso is relatively small and of limited importance from a global climate change perspective.

One of the stated REDD+ strategies of Burkina Faso is to promote alternative, non-fossil energy sources in order to reduce pressure on forests. From a climate perspective, fuelwood can be seen as a good substitute for fossil fuels as long as the extraction rate does not exceed regrowth. If the extraction rate is not sustainable however, energy from wind, solar or sustainably produced biofuels are preferable. Hofstad et al. (2009) suggest that a combination of various measures is most likely the best way to reduce forest degradation from unsustainable harvesting of woodfuels. They propose demand side policies such as accelerated substitution of clean electricity for fuelwood and subsidies for improved stoves in combination with supply side policies such as the already existing local forest management scheme and, not least, better control of harvesting. However, as figures from the National Institute of Statistics have shown efforts to encourage use of improved stoves or butane for cooking have not been successful (INSD, 2007).

A rough calculation based on one conservative and one generous estimation of deforestation (see appendix 2 for details on the calculations), gives us an idea of the potential revenues from REDD+ assuming a total halt for deforestation. As for many countries in arid Africa, depending on what figure is used for deforestation, the potential for reducing emissions could be larger for the second D (degradation) than for the first D (Deforestation). In a next step, there may also be a potential for enhancing carbon stocks, an ingredient of the + in REDD+. Both fuelwood extraction and animal grazing for example, do not necessarily lead to permanent deforestation, but rather to degradation of the forest resources. So far, the focus of REDD+ discussions and work have been on deforestation and it is still unclear how forest degradation can be measured, verified and accounted for. It is important to keep this in mind when discussing REDD+ in Burkina

Faso. Table 2 shows the potential revenues at different carbon prices and different levels of deforestation.

	Avoided deforestation (15000 ha/yr)	Avoided deforestation (105000 ha/yr)	Avoided forest degradation
Carbon saved, million tC/yr	0.53	3.7	3.1
Revenues, carbon price 4 USD/tC (million USD)	2.1	15	12.5
Revenues, carbon price 18 USD/tC (million	9.5	66	56.3
Revenues as % of GNI (carbon price 4 USD)	0.03	0.2	0.2
Revenues as % of GNI (carbon price 18 USD)	0.1	0.9	0.8
Revenues as % of ODA (carbon price 4 USD)	0.2	1.5	1.3
Revenues as % of ODA (carbon price 18 USD)	1	7	5.6

Table 2 Potential revenues from avoided deforestation and forest degradation at different carbon prices

Depending on the carbon price and the rate of deforestation, these simplified calculations show that a complete halt for deforestation could bring REDD+ revenues of between 2.1 and 66 million USD and a complete halt for forest degradation (defined as loss of average above-ground carbon stock in biomass) could bring between 12.5 and 56.3 million USD. This equals 0.2-7% of official development assistance (ODA) received in 2008 for deforestation and 1.3-5.6% of ODA for forest degradation. For a poor country like Burkina Faso, where ODA stands for 12.6% of GNI, these numbers are not impressive from a poverty reduction point of view. It seems implausible that the forests of Burkina Faso are carbon rich enough to bring great incomes from REDD+. However, the rural population of Burkina Faso is very poor and even smaller economic contributions may make a difference in strained household economies. For those that participate in it, woodfuel production is an important source of income, serving as a complement to agriculture. This is evident, both in our own case study in the Nazinon forest and in other available studies (MECV, 2004a; B., Ouédraogo, 2009; Sawadogo, 2006). This opens up the opportunity for creating systems where local forests are managed so as to conserve and enhance carbon stocks against conditional payments. These payments must however be substantial enough to incentivise protection and sustainable management of forests.

Although REDD+ may be feasible at a relatively low cost in Burkina Faso because opportunity costs are low, and although payments could make a difference in household economies, they are unlikely to lead to substantial poverty reduction. Dyer and Counsell (2010) argue that the logic of taking action “where the least economic value is drawn from the forest, [...] in areas controlled by poorer forest users [...] could lead to perpetuating the poverty of the poorest farmers – as it does nothing to improve poor people’s position, merely advocating that one source of a poverty-level income is replaced by another”.

Wunder (2001) describes how deforestation and forest degradation are related to different types of land-use decisions. While deforestation can be seen as an investment in future land uses, forest degradation is caused by for example fuelwood collection, overgrazing and non-wood overharvesting. Wunder (2001) concludes that if these degrading activities are economically marginal, degradation can be reduced by reducing poverty. It will most likely be important to give reduction of forest degradation a prominent feature of REDD+ schemes in Burkina Faso or other West African countries. This will require much work with developing methodologies for monitoring forest degradation. There is also a need for research to better understand the drivers of degradation and how they can be fought. Creating incentives for working towards REDD+ objectives, and making sure they reach local level forest actors will be crucial for successful REDD+ implementation.

Although the literature is ambiguous as to whether the lack of defined tenure is a cause of deforestation, there is a general agreement that clarified tenure is needed before REDD+ can be implemented (Sunderlin et al., 2009). Sunderlin et al. (2009) point out that clear tenure is necessary, not only to create incentives assigning compensation for achieving REDD+ objectives, but also for protecting the rights of people living in and near the forest. If tenure is unclear or contested, the state might resort to command-and-control measures and hold on to REDD+ benefits. The decentralisation process in Burkina Faso has revealed an unwillingness by the state to transfer resources to local levels although the local forest management system shows a will to make forests a local responsibility. Our case study, in combination with the lack of other studies on the local forest management system and the local consequences of the decentralisation process, suggests a need for more comprehensive research on the subject. There is a need to deepen the understanding and knowledge of the local forest management system, not least in order to facilitate the efficient implementation of REDD+.

Possibly even less is known of the management of forests not included in the official woodfuel production scheme. In order to understand how deforestation and forest degradation can be prevented it is necessary to better understand the relationship between rural livelihoods and forests. In countries like Burkina Faso, where the value of forests is low, and productive agricultural land is increasingly scarce, the understanding of this relationship will be crucial if a REDD+ scheme is to have any chance at

succeeding. Not all stakeholders in the forest are involved in forest management activities, and the design of a REDD+ system must take care not to disregard their interests. The possibilities of using the forest for e.g. collection of NTFPs must not be limited or livestock breeders expelled from the forests without compensation or alternative sources of grazing opportunities. NTFPs serve as a complement to farming activities and their importance may come to grow as the frequency of droughts and unpredictable rainfall are likely to grow with climate change and affect farm productivity.

Another issue that is highly relevant in a carbon context in Burkina Faso and many other West African countries is that of trees on agricultural lands. These trees are important from a carbon point of view, but also for adaptation to changes in the climate. While some believe that intensification and increased productivity in agriculture could reduce pressure on forests (Sawadogo, 2006) this could also threaten parklands and agroforestry systems. Increased use of ploughs often leads to a reduction of tree density on agricultural lands. While this may be positive from a food security perspective in the short run, it may lead to increased vulnerability to droughts and other extreme weather phenomena. Trees can provide an alternative source of income. They can also provide fodder for livestock.

In conclusion, Burkina Faso was chosen as a pilot in the Forest Investment Program, FIP, despite its relatively low mitigation potential with the justification that there is a great potential for reproducing successful efforts in the country to other countries with similar climate. An important reason for choosing Burkina Faso was also the relatively favourable institutional conditions. Although we have found substantial shortcomings in the Burkinian forest management system and institutional framework, it is likely that conditions are more favourable than in many other countries in the region, thereby making it a suitable pilot country. It is also important to remember that once REDD+ is fully implemented, it will be open to all countries with tropical forests, independent of their mitigation potential. It therefore makes sense to pilot REDD+ in a wide range of countries with varying institutional, climatic and economic conditions. Ultimately, Burkina Faso may be an interesting country in a REDD+ perspective with the reservation that its significance to the climate is limited.

5.2 Conclusions and implications

Summing up, below are the main conclusions of this report:

- Trees, although not always in the form of forests, are an important resource in Burkina Faso, not least in rural livelihoods. They make an important contribution to income diversification, much needed not least as rainfed agriculture is threatened by climatic changes.

- Future carbon related REDD+ payments are unlikely to lead to significant poverty reduction, but may comprise a welcome contribution to individual household economies and could create incentives for working towards REDD+ objectives. However, this will depend on an efficient system for benefit sharing being established.
- Forest degradation, although difficult to quantify, is of significance to the climate. Its importance may even be equivalent to that of deforestation. This will be important but difficult to take into account in REDD+ implementation.
- A REDD+ scheme in Burkina Faso must be designed so as to take into account the complex relationship between forests, trees and rural livelihoods including agroforestry systems and NTFPs.
- The local forest governance system suffers from problems with embezzlement and corruption that must not be disregarded in the formulation of a national REDD+ strategy.
- The significance of Burkina Faso as a REDD+ pilot lies in what it represents in terms of biomes, economy and institutional framework rather than in its mitigation potential.

This report has identified several fields where further research is needed to get a more comprehensive picture of the potential impacts of REDD+ in Burkina Faso and to guide REDD+ interventions. Listed below are some topics that could potentially be of interest for further Focali research:

- *The local reality of community forest management for fuelwood provision.* The findings from our case study show that local forest management is not working quite as smoothly as the Forest Department and the FIP might have led on. There is a need for deeper knowledge of the actual situation. Otherwise problems might arise as REDD+ implementation faces unexpected obstacles.
- *The role of fast start REDD+ money.* How will it be distributed and what will its impacts be on existing institutions, development plans and governance structures?
- *Management of forests not included in the forest management system and its links to rural livelihoods.* In a next step, it is also necessary to expand and deepen the knowledge about forests not included in the local management scheme aimed at fuelwood provision. REDD+ is supposed to include all forests and understanding of the role of forests and forest products in rural livelihoods will be crucial to successful implementation.
- *The role of forests in the livelihoods of people who are not responsible for forest management, such as livestock breeders, women, migrants and farmers not involved in forest management.* In order to successfully implement a REDD+

scheme, establish a sustainable use of forests and to avoid harming people who depend on forests it is necessary to have a comprehensive picture of the role of forests.

- *The role of trees on agricultural lands for income diversification and livelihood resilience.* Trees on farmlands are prominent in the agricultural landscapes of Burkina Faso and other West African countries. They are important both from a carbon point of view and from the perspective of adaptation to climate change. However, more knowledge is needed about the role these trees play.

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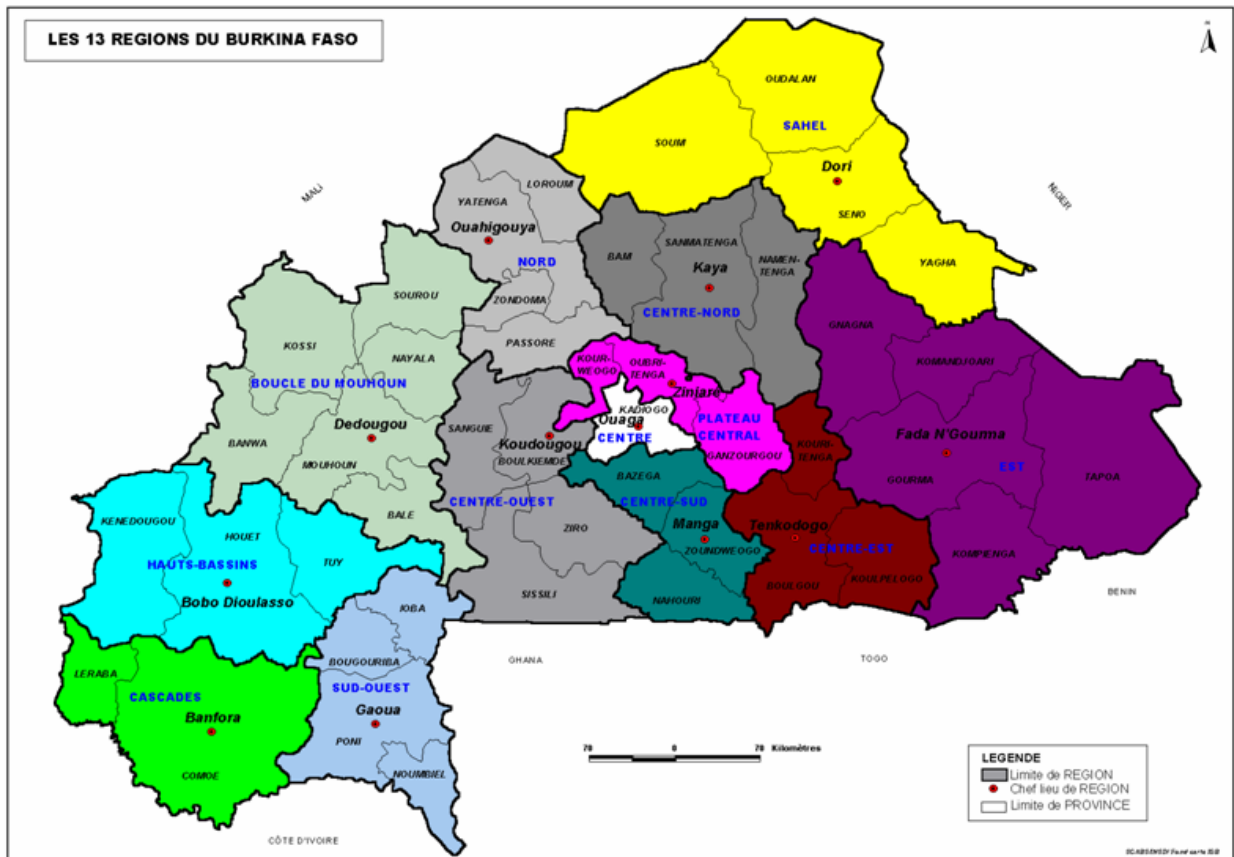
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Appendix 1

Regional map (INSD, 2010)



Appendix 2

Calculating potential REDD+ revenues from avoided deforestation

The most conservative estimation of deforestation in Burkina Faso is 15 000ha/year (FAO, 2010b), while the generous estimation is 105 000 ha/year (Burkina Faso, 2007).

Burkina Faso's forests contained about 35 tonnes of carbon (tC)/hectare in 2005 according to FAO estimations (FAO, 2005).

Completely halting deforestation in Burkina Faso would mean to avoid emitting between $15000 \times 35 = 525000$ tC and $105000 \times 35 = 3675000$ tC yearly.

This estimation assumes that the baseline is entirely based on historical emissions. We disregard opportunity costs for alternative land-use and transaction costs. Further we assume that REDD+ credits are made fully fungible, i.e. that sales are not restricted or limited. These assumptions are largely arbitrary but serve our purposes. It is difficult to know what a reference scenario taking into account projected deforestation rates would imply. Taking into account opportunity and transaction costs would reduce REDD+ payments. It is further likely that REDD+ credits will not be fully fungible but rather subject to restriction.

The future carbon price is difficult to estimate. It will most likely be affected by developments of the UNFCCC negotiations, but also by technological development, national politics and other factors. The price will also depend on whether REDD+ credits are made fully fungible or if sales are limited. For our purposes we have chosen two different carbon prices, a high and a low one. The lower price, 4 USD/tC, is equal to the price the World Bank paid for temporary CDM credits (tCER) from an afforestation and reforestation project in Ethiopia (Carbon Positive, 2010). The higher price is 18 USD/tC which is close to the price on the EU ETS market (Point Carbon, 2010). It is a rather high price for forest offset credits, but provides a hint of how carbon can be valued on the market.

With these prices we can calculate the yearly income of Burkina Faso from avoided deforestation, assuming full fungibility for REDD+ credits and yearly payments according to a reference scenario based on historical deforestation. The lower price would bring incomes of between $525000 \times 4 = 2100000 = 2.1$ million USD and $3675000 \times 4 = 14700000 \approx 15$ million USD depending on the extent of deforestation. The higher price would bring incomes of between $525000 \times 18 = 9450000 \approx 9.5$ million USD and $3675000 \times 18 = 66150000 \approx 66$ million USD

In 2008 Burkina Faso had a GDP (Gross Domestic Product) of 7.9 billion USD (World Bank, 2010). REDD+ payments at the lower price would then equal $2100000 \div 7900000000 = 0.00027 \approx 0.03\%$ of GDP for the conservative estimation of

deforestation and $14700000 \div 7900000000 = 0.0016 \approx 0,2\%$ of GDP for the generous estimation. Payments at the higher price would equal $9500000 \div 7900000000 = 0.0012 \approx 0.1\%$ of GDP or $66000000 \div 7900000000 = 0.0084 \approx 0.8\%$ of GDP respectively for the different estimates of deforestation.

In 2008, Burkina Faso has a GNI (Gross National Income) of 7,3 billion USD (World Bank, 2010). REDD+ payments at the lower price would equal $2100000 \div 7300000000 = 0.00029 \approx 0.03\%$ of GNI for the conservative estimation of deforestation and $14700000 \div 7300000000 = 0.0021 \approx 0.2\%$ of GNI for the generous estimation. Payments at the higher price would equal $9500000 \div 7300000000 = 0.0013 \approx 0.1\%$ of GNI or $66000000 \div 7300000000 = 0.0090 \approx 0.9\%$ of GNI respectively for the different estimates of deforestation.

In 2008, Burkina Faso received a bit over 1 billion USD in development assistance (World Bank, 2010). REDD+ payments at the lower price would then equal $2100000 \div 1000000000 = 0.0021 \approx 0.2\%$ of ODA for the conservative estimation of deforestation and $14700000 \div 1000000000 = 0.0147 \approx 1.5\%$ of ODA. Payments at the higher price would equal $9500000 \div 1000000000 = 0.0095 \approx 1\%$ of ODA or $66000000 \div 1000000000 = 0.066 \approx 7\%$ of ODA respectively for the different estimates of deforestation.

Calculating potential REDD+ revenues from avoided forest degradation

According to the Forest Resources Assessment conducted by the FAO in 2005 the above-ground carbon stock in biomass in forests decreased from 41.4 tC/ha in 1990 to 34.5 tC/ha in 2005 (FAO, 2005). This means an average loss of 0.46 tC/ha/year. The same assessment estimated the forest cover to 6.794 million ha in 2005. Assuming that forest degradation is completely halted, we can use this figure to estimate the potential carbon gains from avoiding forest degradation. In total, $0.46 \times 6.794 = 3.13$ million tC could be saved yearly from stopping forest degradation.

Using the same carbon prices as for avoided deforestation revenues could range from $3.13 \times 4 = 12.5$ million USD to $3.13 \times 18 = 56.3$ million USD.

This equals $12500000 \div 7900000000 = 0.0016 \approx 0.2\%$ of GDP or $56300000 \div 7900000000 = 0.0071 \approx 0.7\%$ of GDP depending on the carbon price used. It equals $12500000 \div 7300000000 = 0.0017 \approx 0.2\%$ of GNI and $56300000 \div 7300000000 = 0.0077 \approx 0.8\%$ of GNI for the different carbon prices respectively. Finally, it equals $12500000 \div 1000000000 = 0.0125 \approx 1.3\%$ of ODA and $56300000 \div 1000000000 = 0.0563 \approx 5.6\%$ of ODA for the different carbon prices respectively.