OCCASIONAL PAPER

Adaptation policies and synergies with REDD+ in Democratic Republic of Congo

Context, challenges and perspectives

Félicien Kengoum

CIFOR

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Photo by Félicien Kengoum/CIFOR
Houses on tilts on the banks of the Congo River, Kinshasa, DRC.

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Abbreviations

ACP	Africa Caribbean and Pacific
ACP	FORENET African Caribbean Pacific-Forest Research Network
AMP	Alliance for the Presidential majority
APV-FLEGT	Agreement of voluntary partnership – Forest Law Enforcement, Governance and Trade
ARC	Alliance for the Renewal of Congo
CADRU	Center for Climate Change Adaptation and Rural Development
CC	Climate change
CAR	Central African Republic
CDM	Clean Development Mechanism
CIA	Central Intelligence Agency
CIFOR	Center for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNI	Initial National Communication
CO_2	Carbon dioxide
COBAM	Climate Change and Forests in the Congo Basin: Synergies between Adaptation and Mitigation
CODECO	Coalition of Congolese Democrats
CODELT	Council for the Defense of the Environment through Legality and Traceability
CoFCCA	Congo Basin Forest and Climate Change Adaptation
COMIFAC	Commission of Central African Forests
CPI	The Integrated Food Security Phase Classification
DDD	Directorate of Sustainable Development
DGM	General Directorate of Migration
DRC	Democratic Republic of Congo
ECCAS	Economic Commission of the States of Central Africa
EPSP	Primary, secondary and professional education
ERND	Environment, natural resources and development
EU	European Union
FAO	Food and Agriculture Organization
FC	Congolese Francs

FCPF	Forest Carbon Partnership Facility
GEF	The Global Environment Facility
GHG	Greenhouse gas
HIV-AIDS	Human Immunodeficiency Virus – Acquired Immunodeficiency Syndrome
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
GTCR	Civil Society Working Group for Climate Change and REDD+
ICCN	Congolese Institute for the Conservation of Nature
HDI	Human Development Index
INERA	Institute for the Environment and Agricultural Research
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IUFRO	International Union of Forest Research Organizations
MAS	Ministry of Social Affairs
MDGs	Millennium Development Goals
MECNT	Ministry of the Environment, Nature Conservation and Tourism
MIDA	Migration for Development in Africa
MINAGRI	Ministry of Agriculture
MINESUP	Ministry of Higher Education
MLC	Movement for the Liberation of Congo
MNV	Monitoring, Notification and Verification
NAPA	National Adaptation Plan of Action
NASS	National Agricultural Statistics Service
NEAP	National Environmental Action Plan
NGO	Non-governmental organization
NTFP	Non-timber forest product
OECD	Organization for Economic Cooperation and Development
OFAC	Central Africa Forests Observatory
OSFAC	Satellite Observatory of the Forests of Central Africa
PACEBCO	Program of Support for the Conservation of Ecosystems of the Congo Basin
PAM	World Food Program
PANU	National Alliance Party for Unity
PDC	Christian Democrat Party
PNIA	National Program of Agricultural Investment
PPRD	The People's Party for Reconstruction and Democracy
PRSP	Poverty Reduction Strategy Paper
RED	Reduction of emissions from deforestation
REDD	Reducing Emissions from Deforestation and Forest Degradation

REDD+	Reducing Emissions from Deforestation and Forest Degradation and enhancement of forest carbon stocks+
REM	Resource Extraction and Monitoring
R-PIN	Preparation Plan 'REDD – Readiness Plan Idea Note'
RPP	Readiness Preparation Proposal
UCL	Catholic University of Louvain
UDEMO	Union of the Mobutist Democrats
UN	United Nations
IUCN	International Union for the conservation of nature
UNADEF	National Union of Democratic Federalists
UNAFEC	National Union of Federalists of the Congo
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIKIS	University of Kisangani
USA	United States of America
USD	US dollars
USFS	United States Forest Service
WRI	World Resources Institute

Foreword

This document is part of a series presenting the results of a set of studies conducted by the Center for International Forestry Research (CIFOR) in the framework of its project entitled Climate Change and Forests in the Congo Basin: Synergies between Adaptation and Mitigation (COBAM).

Initiated in 2010 by CIFOR, COBAM's objective was to capture and present the dynamic of actors and institutions in order to give decision makers useful information that could help them in their choice of options with regard to climate policy.

The project resulted in the publication of documents analyzing national contexts of five countries of the Congo Basin, to identify opportunities for synergies between adaptation and mitigation policies as regards climate change. The present study is inspired by an approach developed by the authors of a similar analysis of the Cameroon context, entitled: Adaption and Mitigation Policies in Cameroon: Pathways for Synergies.

The author would like to express gratitude to all who have contributed to the achievement of this study. Sincere thanks go first of all to political actors, both from government and nongovernment institutions, who agreed to lend themselves to the exercise of semistructured interviews, and who shared the documents at their disposal. Special thanks also go to the reviewers of this work (CIFOR staff or anonymous reviewers).

Finally, special thanks go to the Central Africa Forestry Commission (COMIFAC), the African Development Bank (ADB) and the Economic Community of Central African States (ECCAS) for their support through the *Programme d'Appui à la Conservation des Ecosystèmes du Bassin du Congo* (Program of Support for the Conservation of Ecosystems of the Congo Basin (PACEBCo)).

Summary

Theories have evolved with regard to mitigation and adaptation as strategies of the United Nations Framework Convention on Climate Change (UNFCCC) to combat climate change. These strategies initially focused on the need to take those theories into account in national climate policy through various mechanisms. The initial strategy was to mainstream adaptation and mitigation separately. However, this approach was quickly proven unsatisfactory. Nowadays, the approach of synergy between adaptation and mitigation is at the center of major debates on climate change.

The issue of synergy between mitigation and adaptation has long been presented as a question of environmental technique. However, the issue of synergy in climate policy has become a challenge if the objectives of the UNFCCC at the national level are to be achieved effectively.

This study attempts to answer a central question: is it possible, in the current context, to envisage synergies between adaptation and reducing emissions from deforestation and forest degradation and enhancement of forest carbon stocks, (REDD+) policies in Democratic Republic of Congo (DRC)? Data for the study were collected from semistructured interviews with 27 political actors at the national level as well as from available general and specialized literature. The study is built on the concepts of integration and policy coherence. It uses decision theory, scenarios and resilient thinking theories to formulate the following general assumption. In the current state of the political scene of DRC, the very low level of integration between climate policy and development policies, coupled with the low coherence of integration efforts around adaptation policies and mitigation in general, it is difficult to envisage with success the construction of synergies between adaptation policies to climate change and REDD+. This hypothesis has been confirmed after obtaining the results presented here.

Difficulties in capturing the adaptation policy of the country

DRC does not yet have a national plan for climate change adaptation, nor a policy document on the issue, but only a program-related document showing that, for the time being, the national adaptation policy is mainly oriented toward agriculture, which occupies 70% of the active population of the country. Uncertainty remains about adaptation policies relating to various sectors and livelihood activities other than agriculture that are vulnerable to climate change. Yet, the need for an adaptation policy remains real in other sectors, and while there are initiatives that do not bear the label 'adaptation,' they still affect the decisions yet to be made on this issue. Taking advantages of these options by sector and livelihood activities requires a reconstruction effort from diverse entities. Efforts made to obtain an overall view reveal several facts.

1. There is no adaptation policy to benefit forests. Agroforestry, which involves the processes of planting and selective management of forests, takes into account various types of activities. However, there is no clarity on the inclusion of agroforestry in a regime of afforestation specifically geared toward silviculture. The immediate consequence of this is the absence of any framework for the exploitation of trees planted in the fields.
2. The current energy policy, oriented toward wood energy, is an obstacle to adaptation by the forests, due to the strong dependence of the populations on fuelwood and the absence of sustainable alternatives.
3. Migration policy has not yet considered nor been framed in a specific way to take account of environmental migration. Only migration linked to disasters, particularly during wars, has been the subject of specific measures. Consequently, environmental migration has not yet been framed as a strategy for adaptation.

Weakness of policy integration and lack of coherence between climate policy and national development policies

Although much effort has been made to integrate climate policy into the sectoral policies of development (such as those of agriculture, energy and forestry), it can however be seen that this effort is still insufficient. One explanation could be that the dynamic of integration is mostly in the hands of international actors. Then, these efforts are carried out unilaterally by the sectoral administrations, without any consultation or participation of the ministry in charge of climate issues, at any of the national, provincial or local levels. The immediate corollary of this state of affairs is the lack of coherence between the various components of the climate policy, even those within the development policies, which constitutes a preliminary barrier to any effort of synergy between adaptation and mitigation within the climate policy.

Need for better intersectoral and multilevel governance to achieve synergy between REDD+ processes and the adaptation policy

In the absence of strong integration and coherence between the climate policy and sectoral policies for development, achieving synergy between adaptation to and mitigation of climate change remains difficult in DRC. In fact, multiple endogenous and exogenous factors and structural matters influence the development policy of DRC, whose current state explains the level of vulnerability of the development sectors and livelihood activities of the local populations. In DRC, political priority is given to security issues and to the preservation of power by the authorities in place. The architecture of the government, which results from the share of power with other political parties, is an explanatory factor of the difficult collaboration between the sectoral ministries; most ministers perceive their presence at the head of the ministries as a reward that they are not likely to lose, even in the case of poor management of their own portfolios. The appropriation of climate policy processes seen as having been imported from international initiatives therefore remains a real challenge.

Introduction

Forests cover nearly 30% of the Earth's surface (FAO 2001; Dresner et al. 2007). The Congo Basin contains the second largest tropical forest after the Amazon, representing 17% of the world's coverage. Forests are considered as important carbon sinks and reservoirs (Laurance 2007). Their destruction contributes to approximately 17.4% of the greenhouse gas (GHG) emissions caused by human activity (FAO 2001; Dresner et al. 2007; IPCC 2007a). As well, nearly 70% of the increase in GHG emissions between 1970 and 2004 are attributed to human activities. This trend will continue to increase if appropriate policy measures are not envisaged (IPCC 2007a). This observation has marked a decisive turning point in the international strategy since 2005. The challenge is to introduce the forests as an instrument in a post-Kyoto agreement on climate change for both mitigation and adaptation.

While mitigation is concerned with the causes of climate change, adaptation targets the consequences observed. In the case of mitigation, the negotiated mechanism appropriate for forests first entailed reducing emissions from deforestation (RED), which later included reducing emissions from forest degradation (REDD) and the improvement of carbon stocks (REDD+). The REDD+ mechanism is based on the idea of rewarding those who reduce deforestation and forest degradation. To achieve this, however, forests need to be managed in a sustainable manner, without compromising the objectives of the development of the countries involved in the process. With regard to adaptation, the choice of instruments at the international level remains a real challenge because of the difficulties in identifying the factors of vulnerability, which occur largely at the local level, in order to develop appropriate measures.

An analysis of the literature shows that many studies have focused on mitigation in general and on REDD+ in particular (Kengoum et al. 2013; Mpoyi et al. 2013), and that adaptation is still not at the same level of consideration. As such, mitigation and adaptation are treated separately, although both are most often on the agenda of the actors or groups of actors that sometimes mobilize the same resources. Therefore, the main question this study attempts to answer is: how do we envisage, in the context of poverty and a lack of financial, human and logistical resources, synergies between mitigation and adaptation to climate change in Democratic Republic of Congo (DRC)?

Several subsidiary questions were formulated. What are, in the current development policies of DRC, the opportunities and constraints for an integration of climate change concerns? In light of the context of mitigation policies, especially REDD+ and adaptation to climate change, what are the risks, opportunities and necessary compromises of a synergistic approach to both adaptation and mitigation in DRC? What are, in a global context and via a national fight against climate change, the implications for a sustainable management of forest ecosystems of the country?

The present study attempts to draw up a national profile on potential synergies between adaptation to and mitigation of the effects of climate change by characterizing climate change adaptation policies in DRC; assessing integration and coherence between these adaptation policies and the ongoing discussions on the REDD+ process; and identifying niches of opportunities and compromise for synergies between adaptation and REDD+ in the country.

The literature search led to the formulation of the following general assumption: in the current state of the political scene in DRC, the very weak integration of climate policy into the development policies, as well as the low coherence of integration efforts of mitigation policies and adaptation in general would make it difficult to envisage with success the construction of synergies between REDD+ and adaptation policies.

1 Conceptual framework

To reach the objectives set for this study, on the one hand, we have developed a conceptual framework around concepts of integration and policy coherence for development of climate policy and of synergies between mitigation and adaptation to climate change. On the other hand, these concepts are examined based on decision theory in the context of uncertainty in order to understand the choice of policy options for mitigation and adaptation in DRC, a country of many uncertainties.

1.1 Integration and coherence of climate policy and the development framework at the national level

In general, the development framework incorporates many other sectoral policies. The novelty of the paradigm of the fight against climate change raises many concerns about its consideration in development policies, and raises the question of whether it receives the same level of attention as other sectoral policies. However, climate policy agendas are now a reality, at both national and international levels. In the context of DRC, integration entails taking into account various sectors of development, both environmental and nonenvironmental, at various stages of the political process. Then, in the climate context, it corresponds to the effort by policy makers to aggregate the possible consequences of climate change in the assessments of policies, with a view to minimizing the contradictions between climate policy and other sectoral policies (Underdal 1980; Van Bommel and Kuindersma 2008). The required coherence is intended to avoid sectoral policies contradicting themselves (Kengoum and Tiani 2013). Coherence passes through the promotion of political actions that are mutually reinforcing, in uniting the efforts of various government departments and other agencies (Jones 2002).

In Figure 1, those development policies that are composed of all different sectoral policies that are not related to climate are grouped together, whereas climate policy is in a separate group. In the first group are policies that contribute to climate change through GHG emissions and that affect those vulnerable to climate change, such as agriculture, or those that, while they participate in climate change, are vulnerable to the changes in which they participate. In the second group is climate policy with mitigation and adaptation options. At the margin of these two groups are vulnerable livelihood activities of different local communities, which are most often midway between the sectors of development that are vulnerable to climate change and adaptation options that reduce climate change.

In a perfect model, not only are climate change policies mainstreamed in national development sectors policies, but coherence among different policies are important. Such integration and coherence should also apply to mitigation and adaptation policies. This is very important in the construction of possible synergies between adaptation and mitigation. In other words, in developing countries, any effort to build synergies between adaptation and mitigation policies aimed at reducing the impacts of climate change outside national and local development policies will likely fail.

1.2 Synergy between climate policy and socioeconomic and political development

The synergy goes beyond the mere fact of the joint implementation of mitigation and adaptation processes. There is synergy when several factors combined produce an effect greater than the sum of their expected effects

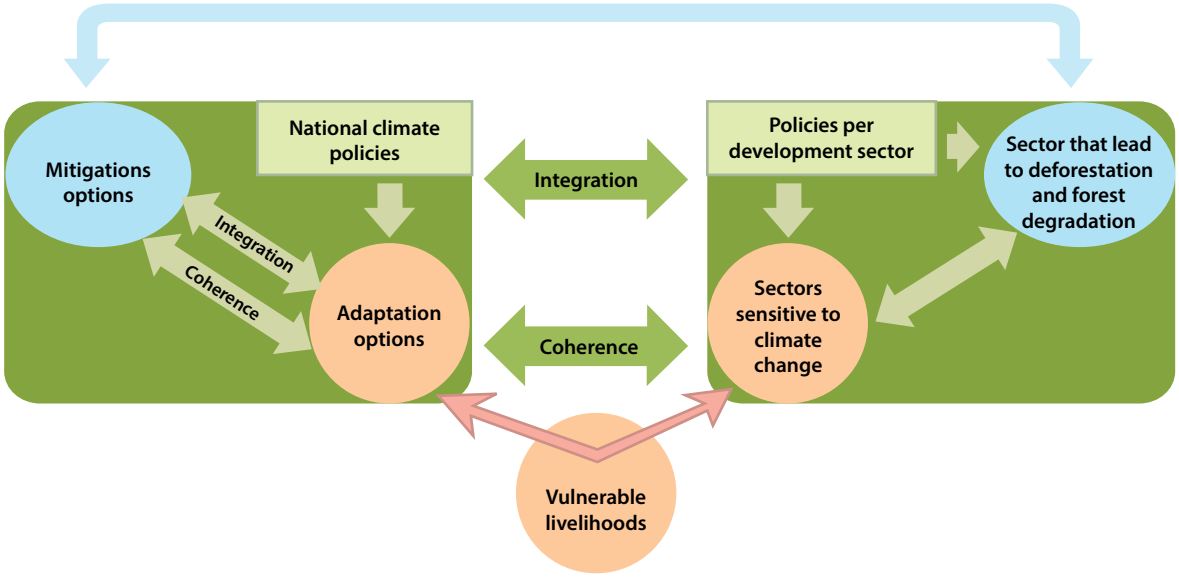


Figure 1. Climate policy and development sectors in the forest context.

Source: Kengoum *et al*. 2013.

if they were put in place separately (Morin 1990; IPCC 2007a). Creating the synergy between adaptation and mitigation policies related to climate change goes through a coordination of actions and a sharing of resources between the actors, both at national and local levels (Challinor et al. 2007; Howden et al. 2007). Thus, the value added by the synergy can be measured using the best and most efficient logistics (characterized by an economy of effort, time or resources) compared with a business-as-usual scenario. In other words, the synergy is effective when savings are realized or when the expected outcomes increase without incurring additional costs. In the context of developing countries where resources are limited, synergy between mitigation and adaptation policies is important for at least two reasons. On the one hand, it makes it possible to fight against poverty by limiting the costs of transactions and opportunities in the implementation of the two strategies, but it also helps save time. The example of the Barnier Law in France of 1995 is very illustrative in this regard. In its definition of the precautionary principle, it includes the concepts of 'proportionate response' and 'economically acceptable cost.' On the other hand, synergy helps protect forest ecosystems by the construction of a context of governance conducive to an effective and sustainable management.

Investing in REDD+ in the context of poverty entails that the initial contribution of adaptation to deforestation and forest degradation be considered. It is only after this, that synergies between mitigation and adaptation policies will be possible in the forest sector. Otherwise, proposed policies might in fact promote maladaptation and increase vulnerability of the populations and forest ecosystems. Therefore, development of synergistic policies should be envisaged (Kengoum et al. 2013). As such, informed climate and development policies should be synchronized for the construction of mutually reinforcing policies in the context of developing countries. But uncertainty is the principal constraint that needs to be overcome.

1.3 Sociopolitical uncertainties and policy making

Taking decisions in a context of certainty already poses challenges. To do so in a context of uncertainty is even more difficult. One of the first strategies for policy making in the context of uncertainty is the use of the precautionary principle instituted by the Rio convention. This precautionary principle stipulates that 'in the event of a risk of serious or irreversible damage, lack of full scientific certainty should not be used as a pretext for delaying the adoption of effective measures to prevent environmental

degradation' (UNFCCC 1992). In addition to risks directly related to changes in climate, there exists in DRC a set of other risks that constitute constraints to climate change adaptation and related political decisions. Identified risks are those linked to sociopolitical context, population livelihood activities and a total lack of clarity in the international climate change regime.

1.3.1 Sociopolitical insecurity, migration and food insecurity

Beyond the risk that it already constitutes, climate change is now accepted as a security issue (Adano and Daudi 2012). Observed from the perspective of adaptation to climate change, sociopolitical insecurity reinforces vulnerability. Not only does insecurity arise as a constraint to natural adaptation by its direct impact on the availability and accessibility of resources, but it opposes the decision-making process of conjunctural limits. Political insecurity, for example, due to the civil war, is usually the cause of substantial migration. Migration is just a response to stress posed by the insecurity. In this case, migration is therefore an adaptation strategy. As stated by Robson and Berkes (2011), the displacement of the rural population in the forest area may lead to the deconstruction of local institutions involved in community management of forests, and the loss of traditional agricultural practices that contribute to the maintenance of various landscape mosaics. Similarly, the rural communities, whose main activities (agriculture, fishing, animal husbandry) are stopped and their usual income limited during the period of instability, will return to the forest resource for their livelihoods (Rosegrant and Cline 2003; Walker and Salt 2006). This reliance of the populations on forest resources explains the serious impact in terms of loss of biodiversity. The immediate and most visible consequences are conflicts over land and food insecurity.

Food insecurity can only be properly defined with regard to food security. The most commonly accepted definition is the one adopted at the World Food Summit in 1996. By that definition, '*Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life.*' In developing countries, there might be biases with regard to food security based on agricultural production statistics. It sometimes happens that a country produces beyond the quantities necessary for the food security of its inhabitants, but that the greater part of this production is exported to other countries or simply that it cannot be evacuated to the areas of consumption, nor even to the areas of food crisis due to structural or conjunctural constraints such as poor roads, poor commercial policies and sociopolitical crises. However, the ratio between food production, export, import, and actual consumption at the interior of the country concerned is important for any analysis of food security. As such, political stability is therefore essential to the effort intended to ensure food security in a rural forest context.

1.3.2 International climate regime and influences on national policies

The term 'regime' used here corresponds to the institutional arrangements from the formal and informal negotiations between the actors. It is distinguished from governance, which aims to coordinate the actions of the actors to achieve a specified purpose. Krasner (1982) defines the explicit or implicit principles, norms, rules and decision-making procedures of the international regime around which converge the projects and expectations of actors in a given area of international relations. As such, the international regime can influence the national decision-making process through multilateral treaties, rules and international discourse, markets, direct funding, technical assistance and capacity building (Eba'a Atyi et al. 2011). Imported from the international climate regime, the deployment at double speed of mitigation and adaptation measures poses a problem if one considers the existing link between the two strategies, which constitute the responses to climate change (Locatelli 2011). The international climate regime is still under discussion with regard to mitigation and adaptation. However, the choice of options at the national level is essentially dependent on the stakes that they assume in the international negotiations.

1.4 Approach: Decision, scenarios and resilient thinking

In general, decision-makers have the desire to remain as rational as possible. In this regard, they try to use the existing and available information to derive the best possible decision. This approach is based on the decision theory developed by

Morgan and Henrion (1990). Our analysis will focus on the context of DRC, where information about the policy process of adaptation is almost nonexistent and where information available in the field of mitigation, particularly in REDD+, is centralized and concentrated (Kengoum and Tiani 2013). This situation results in a cognitive bias and an asymmetry of information at different levels of decision-making. The latter must then be taken in a context of uncertainty, relying solely on the existing available information. If one combines the approaches studied according to the various scenarios, it is possible to construct the available information in consistent and rich stories, allowing for conceptualizing the future, as shown by Carpenter et al. (2006). With regard to resilient thinking, it stems from the premise that the ability to recognize and respond to emerging transformations before they occur is a fundamental element in complex systems (Chapin et al. 2010). Its involvement in the present analysis of the synergies between climate policy and development policies in DRC is justified by the fact that it helps generate a clear and inclusive view of the entire system in order to include in the decision-making all the important factors, even when they are ambiguous and nonquantifiable (Mendonca et al. 2004; Polasky et al. 2011), as is the case in DRC.

2 Methodology

This section consists of two parts: the process of data collection, and the tools used to process and analyze the data.

2.1 Method of data collection

To achieve the objectives of this study, primary and secondary data were collected both quantitatively and qualitatively. The collection took place in two phases in the city of Kinshasa: from 1 to 16 March 2013 and then from 20 October to 2 November of the same year.

The primary data were obtained using semistructured interviews with top political actors; and documentation incorporated by legal texts (national legislation, laws and decrees), policy documents and programs, and reports of sectoral and intersectoral studies. The secondary data were drawn from the general literature and, secondarily, from interviews with actors involved in the policy process.

An extensive literature search was carried out to obtain the original information from the political actors involved in the adaptation and mitigation of climate change in institutions at the national level. The choice and the sampling of actors was drawn from the literature, including the document of the national adaptation plan of action (Ministry of the Environment, 2006) and the project document of the Project for Capacity Building in the Agriculture Sector and Food Security in DRC (PANA-ASA), the initial national communications on climate change of 2001 and 2009. A list of identified actors was then submitted to a group of six anonymous experts for validation. Those actors were from the administrations and national and international organizations whose climate change activities are part of their agenda in DRC, and/or that are involved in the activities bearing the label 'adaptation to climate change.' The expert group validated the starting list composed of 31 organizations. The approach was however supplemented by a 'snowball effect' approach, which has helped identify other actors during interviews. In total, 38 actors were selected for the survey. The selection criterion was the link of their activities with climate change processes. Similarly, some actors whose activities did not carry the label 'adaptation to climate change' have been chosen and associated with the study because of the adaptive nature of their activities or the impact of the latter on the policy process of adaptation. The choice also took into account the less structured character of adaptation in DRC. In the end, a total of 40 anonymous actors were interviewed.

A search revealed that the specific literature on adaptation policies is quite difficult to access in DRC. Semistructured interviews were the most appropriate opportunity by which to identify and collect the existing literature from staff encountered in administration and different organizations. Information from the literature has been supplemented with that from interviews of respondents from various organizations known to work on climate change in DRC (see Appendix 1). This collection really helped add important references to those obtained through digital search engines, in particular the national legal texts, programs and strategy documents, the reports of sectoral and intersectoral studies, as well as books and scientific articles.

2.2 Data analysis

A qualitative approach was the main method used for data analysis. The analysis was based on three decision theories, different scenarios and resilient thinking, in the context of the literature and discourses during interviews, to achieve two ends: (i) to characterize what constitutes the policy of adaptation in DRC in various areas, and (ii) to

identify the issues of the different policy options for synergies between policies of adaptation and REDD+ in the country. In the first approach, the information derived from the literature review and interviews helped classify not only data bearing the label 'adaptation and REDD+,' but also data which, while not institutionally labeled as 'adaptation,' in reality represented an adaptation process. Thus, in the absence of a document of specific policy, the data collected were used to reconstitute what could represent the components of adaptation policy in DRC as it emerges from the current adaptation practice in the various sectors and within local vulnerable livelihoods. After having conducted this reconstitution, the data were crossed with those derived from a REDD+ context in order to identify the opportunities and risks involved in constructing synergies between adaptation policies and REDD+.

A set of obstacles was encountered: they deserve to be mentioned because of their importance. First, the fact that the statistics in the country are old or incomplete and sometimes simply nonexistent makes it difficult to provide a systematic extrapolation of results to the whole country. Second, the lack of maturity of adaptation initiatives, as well as of the policy process, and their dispersal requires a reconstruction from scattered information. As a consequence, some initiatives may have been missed in the list established from the collected data. As a matter of fact, there were initiatives which, although not labeled as adaptation, were put in place in response to the observed changes in the climate and thus merit being regarded as models on which to rely in a construction process of strategic policy options for adaptation.

3 Results: Development framework with regard to the Millennium Development Goals in DRC

A glance at the development policies with regard to climate policy shows that they put man and nature at their center. The Millennium Development Goals (MDGs) provide an interesting framework in this perspective. Eight objectives of MDGs were set to evaluate the progress made in the field of development, in line with specific indicators (Box 1). One of the tools used in this perspective is the Human Development Index (HDI), which is presented as an interesting tool with which to assess the proportion of development that affects human well-being. Its calculation considers the essential dimensions of health, longevity, access to education and the attainment of a decent standard of living. The concept of poverty in the HDI has experienced an evolution, in going beyond the previous measures, which were limited to income. Today, it encompasses poverty in a multidimensional perspective. In doing so, it exceeds the traditional images of poverty to embrace other dimensions that relate to family life style, particularly in the area of access to clean water, fuels, health care services, basic household goods and standard homes (UNDP 2012).

Box 1. The eight Millennium Development Goals

1. Reduce extreme poverty and hunger
2. Ensure primary education for all
3. Promote the equality and empowerment of women
4. Reduce infant mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure a sustainable environment
8. Develop a global partnership for development.

Since 2011, DRC has regularly occupied the last position of this classification (see Table 1), which covers a total of 187 countries (UNDP 2013). In its human development report of 2003, UNDP identified four critical constraints for a sustainable human development: reform of the economy for the establishment of a macroeconomic stability; strong institutions and governance for a better State of law; establishment of social justice; and finally the overthrow of structural constraints to economic growth and human development (UNDP 2003).

The Poverty Reduction Strategy Paper (PRSP; DRC 2006) states that poverty in DRC is of economic, cultural, political and social origin. PRSP 1 and 2 confirm the multidimensional aspects of poverty as presented by the HDI. The HDI of DRC has not experienced significant growth between 1980 and 2012. It only moved from 0.286 to 0.304, an increase of 4% (UNDP 2012), while the index of multidimensional poverty is of 0.392% (UNDP-DRC 2013). In both cases, the HDI of DRC is below the average of the subregion of central Africa. In fact, 71% of Congolese live below the poverty line, earning less than one US dollar per person per day. The results of the survey of perceptions about living conditions performed on the occasion of the preparation of the PRSP reveals that 79% of the population experience food concerns, 81% state they are poorly housed and 82% are unable to afford health care (DRC 2006). The document states that poverty is more prominent in rural areas than in urban areas, and has an unequal distribution if data by province are considered.

More than half of the children who are not enrolled in schools live in sub-Saharan Africa (United Nations 2013). The education sector is therefore not spared by the poverty, despite the policy of free tuition for primary school students

in the public institutions of DRC. The lack of education is a direct consequence of economic poverty and far-reaching political instability. In fact, 18% of the GDP of DRC is set aside for the education sector, but this is still greatly inadequate, and is the reason why the country still seeks aid, which in 2008 represented about 30.4% of the total education budget (UNESCO 2011). The average duration of schooling in the country is 3.5 years (UNDP-DRC 2013). The educational system is managed by three separate ministries: Ministry of Primary, Secondary and Professional Education (EPSP), Ministry of Higher Education (MINESUP) and Ministry of Social Affairs (MAS). The Ministry of Social Affairs is responsible for matters associated with nonformal education, including academic upgrading, literacy for youth and adults, professional learning and the continuing education of adults (DRC 2013). Figures available from an EADE-DRC survey in 2012 reveal that the school population distributed by age group is almost two times larger in rural than in urban areas (Table 2).

The PRSP for DRC identifies six sectors essential to the development of the country, qualified as 'carriers of growth.' These comprise the sectors of rural development and agriculture, forestry, infrastructure and transport, mining, electricity and the private sector. An analysis by sectors and by themes shows that the context of poverty in the DRC is exacerbated by four major factors; these constitute the inability of the governance structures of the country to ensure the peaceful settlement of disputes, to prevent political crises and armed conflicts, to effectively decentralize power and to effectively implement programs and projects in all these promising sectors of growth (DRC 2006).

This context of political and administrative governance participates in the exacerbation of the vulnerability of certain categories of social actors. This is particularly the case for politically and climate-displaced people, who, because of frequent migration, have been dispossessed of their property and thus been deprived of their basic rights.

The economic situation of the country is not static. It is characterized by the dominance of the informal sector in a context where the financial sector, which has been shaken by the recurrent political instability, is not successful in fulfilling its function of financial intermediation. Between 2002 and 2005, the economic policy of the country was characterized by what is termed 'careful' implementation of fiscal and monetary policies (DRC 2006).

Findings from the aforementioned data reveal that, despite efforts, poverty in DRC has increased more in rural areas than in urban areas. However, 80% of the Congolese population lives in rural areas, with only 17% having access to drinking water and 1% to electricity, while 70% of the people live in thatched houses and 70% derive their income from agriculture (DRC 2006). In the final analysis, with the exceptions of the fight against AIDS and the empowerment of women, no real progress has been observed in the other objectives of the MDGs (DRC 2011). The macroeconomic situation of the country means, however, that the failure of DRC to achieve the MDGs by 2015 is inevitable, and that the deadline in 2020 may be postponed, subject to the improvement of macroeconomic conditions (DRC 2011).

Table 1 . Development indices for the countries of the Congo Basin.

Country	Poverty	Nutrition	Agricultural land	Jobs	Access to food
	% of poverty below national poverty threshold	% of children under 5 years old with insufficient weight	% of agricultural area	% of economically active population in agricultural sector	% of tarred roads
Cameroon	39.9	16.6	19.8	46.4	8.4
[a]CAR	62	21.8	8.4	62.3	…
Congo	50.1	11.8	30.9	31.2	7.1
[b]DRC	71.3	28.2	9.9	56.7	1.8
Equatorial Guinea	…	10.6	10.9	63.8	…
Gabon	32.7	8.8	19.9	25.5	10.2
Sub-Saharan African average	…	21.3	52.6	58.2	23.8

a CAR = Central Africa Republic

b Democratic Republic of Congo.

Source: Megevand 2013.

Table 2. Distribution in percentage of the school enrollment by age groups depending on the sex and area of residence.

Age group	Urban			Rural		
	Boys	Girls	Average	Boys	Girls	Average
5 years	8.5	9.7	9.1	11.4	11.6	11.5
6–11 years	50.3	49.8	50.0	52.2	52.3	52.3
12–13 years	16.0	13.6	14.8	15.3	16.0	15.7
14–17 years	25.2	26.9	26.1	21.0	20.1	20.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Staff	4,193,295	4,205,790	8,399,085	8,965,230	8,090,964	17,056,194

Age group	National average		
	Boys	Girls	Average
5 years	10.5	10.9	10.7
6–11 years	51.6	51.4	51.5
12–13 years	15.6	15.2	15.4
14–17 years	22.4	22.4	22.4
Total	100.0	100.0	100.0
Staff	13,158,525	12,296,754	25,455,279

Source: Data from the survey of households, DRC (2012)..

4 Forest, context of vulnerability and governance

The systems of governance are important to setting up frameworks for the formulation, financing and implementation of adaptation strategies at several levels (Brockhaus et al. 2012), thus showing the importance of analyzing the context of forest governance of the DRC in relation to the vulnerability of populations to climate change.

DRC is home to the largest share of the Congo Basin forest, with an area variously evaluated at 145 million hectares (Debroux et al. 2007), 154,135,000 hectares (Blaser et al. 2011; FAO 2011) and 155.5 million hectares (de Wasseige et al. 2009; Mertens and Belanger 2010). If the agreement about this last estimate is confirmed, the forest would occupy almost 67% of the territory. The annual rate of deforestation in the country is relatively low. It has been 0.2–0.3 for the past 20 years (MECNT 2006; FAO 2011), despite some reservations by Debroux et al. (2007). In the same direction, Mpoyi et al. (2013) observe from available studies on the dynamics of deforestation in the country that 'population density' is a fundamental element in the explanation of the phenomenon of deforestation. In this regard, the latest estimates show that the population of DRC was 62.6 million inhabitants in 2007 (ADB/OECD 2008) and had increased to 70 million in 2010 (CIA 2010).

Although one is tempted to think that the low rate of deforestation characterizing the country is an asset for forest conservation, sustainable management of forests in DRC remains a concern. The major causes of deforestation are related to the lifestyles of forest peoples. As a matter of fact, the community uses of forests constitute the main cause of deforestation and forest degradation. They include agriculture, including shifting and swidden agriculture for subsistence, wood energy and construction (Tollens 2010; Megevang et al. 2013). Forest exploitation contributes only slightly to deforestation, with annual production very rarely exceeding 500,000 m^3 (Mertens and Belanger 2010). It must be recalled here that, since 2002, the Government of DRC has included a moratorium on the allocation of titles of forest exploitation.

4.1 Causes of vulnerability in DRC

DRC is a country with particular characteristics. Its historical trajectory is marked by 30 years of authoritarian regime, between its accession to independence in 1960 and the almost total collapse of legitimate power at the end of 1980. For the last 10 years, an effort to restore legitimate power has been negotiated (Nzongola-Ntalaja 2004; Trefon 2010). Political instability has been at the origin of the overexploitation of many natural resources in the country (Debroux et al. 2007) such that the forest resources have not been spared. To date, the situation is such that reconstruction and reconstitution of DRC territory and its institutions by democratic governance are difficult. The implications are enormous for the Congolese people, because the resources obtained from forests are essential and their unavailability is a real problem in several areas.

4.1.1 Poverty and dependence on forest resources

Forest exploitation, both formal and informal, contributes to the economy of the country. Yet, forest contributions to the country's GDP still remain difficult to access. Those given by the Central Africa Forests Observatory (OFAC) locate it at 1%. The forests of DRC offer to its populations a range of ecosystem services. They constitute a lifeline for local people. Forests serve as a pharmacy and a supermarket for them. Thus, the forest has a special significance for local people and even for urban people who become dependent on forest ecosystem goods and services. As a matter of fact, the collection of wood energy covers 95% of household energy needs in DRC (UNEP 2011). Any decisions on forests should therefore be taken carefully to avoid cases of maladaptation (see Box 2)

Box 2. Free discourse on maladaptation in the context of climate change in DRC

Maladaptation to climate change is defined by the IPCC as 'a change in the natural or human systems which leads to an increase in the vulnerability instead of reducing it.' Schegara and Gransch (1998) discuss maladaptation from the perspective of considering 'the potential negative effects of adaptation strategies in order to avoid the solutions which are worse than the problem.' The debate around maladaptation is therefore built directly on the debate about the uncertainties in relation to the adaptive process. Alexandre Magnan (2013) postulates that an interesting starting point is to focus on the initiatives that will help avoid maladaptations instead of searching for the 'ideal' adaptation initiative. From the policy perspective, today's challenge is to take decisions that will not cause more problems than those we are trying to solve. The risk of maladaptation is greater when one considers the interface between people and forests from the perspective of adaptation. In fact, in the context of developing countries, the populations in DRC are highly dependent on forest products, especially non-timbers forest products. The challenge therefore is to know under what conditions efforts to reduce emissions from deforestation and forest degradation can succeed without climate change adaptation efforts or livelihood activities being converted into illegal forest resource exploitation through legal and institutional reforms.

In general, State law inevitably creates some detrimental effects, areas of ambiguity and other clearly illegal zones (Haymann and Smart 1999). In African societies, there is a superposition of customary and modern laws. As such, it is sometimes difficult to dissociate legal customary law from illegality if one considers that illegality is what is not consistent with the law.

The concept of illegal customs is now acknowledged. Between customary and modern laws is the issue of legality and illegality. Rural populations generally have customary lifestyles, which evolve in time according to the changes in their environment by way of spontaneous adaptation.

The initiatives aimed at forest conservation in DRC are manifested in general by an exclusion or restriction of access rights and a greater control over the use of the resource. The exclusion is particularly through the classification of a forest in any other form of reserve or land use, while the restriction of access or user rights is reflected by a limitation in the exploitation of the soil or of the timber and non-woody items. Access to forest resources in DRC is regulated by a set of measures taken to safeguard the rights of local populations. According to the Forest Law of 2002 (articles 37–39 and 41), access and user rights were limited to use of forest resources for food, medicine and artisanal products. However, any exploitation for commercial use is prohibited except for those products authorized by the governor of the province. The risk of this and other similar provisions is twofold. First, it can lead to a sociocultural maladaptation when adaptation options are not in line with the social and cultural values of the community, and second, an economic maladaptation may arise when the initiative generates poverty and leads to an irreversible situation in terms of investment.

4.1.2 Continuous depletion of forest resources

Forest disappearance is a reality in DRC. The average annual rates of deforestation in the country were on the increase from 1990 to 2005 (Table 3). The FAO (2011) estimated deforestation at 0.2% during that period. Many causes, both direct and indirect, are at the origin of this loss of forest cover. The literature identifies agriculture, forest exploitation and the use of firewood as the direct causes of deforestation (Global Witness 2011; UNEP 2011; Devey 2012). Indirect factors include economic factors (proximity to major urban centers, the borders); mining and forest concessions; the development of transport infrastructure (with the opening of roads that promote access to the resource and its evacuation); demography (increase of the population and the size of the households); biophysics (forest fragmentation, degradation, slopes and presence of inland waterways); and sociopolitical factors (installation of refugee camps, development of areas of conflict and of protected areas). In DRC, mining employs 18% of the population (UNEP 2011). Nearly 14 million households practice agriculture (Devey 2012), across an agricultural area ranging between 4 and 6 million hectares (DRC 2008).

Table 3. Rate of deforestation and reforestation in areas of the Congo Basin with dense forests.

	Rate of deforestation in the Congo Basin							
	1990–2000				2000–2005			
		Deforestation Gross (%)	Reforestation Gross (%)	Déforestation Net (%)		Déforestation Gross (%)	Reforestation Gross (%)	Déforestation Net (%)
Cameroon	51	0.10 ± 0.05	0.02 ± 0.01	0.08	20	0.17 ± 0.14	0.14 ± 0.19	0.03
Congo	70	0.08 ± 0.03	0.04 ± 0.02	0.03	40	0.16 ± 0.06	0.08 ± 0.05	0.07
Gabon	58	0.08 ± 0.03	0.03 ± 0.01	0.05	12	0.07 ± 0.05	0.07 ± 0.07	0.00
Equatorial Guinea	8	0.13 ± 0.09	0.11 ± 0.18	0.02	0	-	-	-
[a]CAR	26	0.09 ± 0.05	0.02 ± 0.02	0.06	23	0.10 ± 0.06	0.04 ± 0.05	0.06
[b]DRC	334	0.15 ± 0.02	0.04 ± 0.01	0.11	242	0.32 ± 0.05	0.10 ± 0.03	0.22
Congo Basin	547	0.13 ± 0.02	0.04 ± 0.01	0.09	337	0.26 ± 0.04	0.09 ± 0.02	0.17

a CAR = Central Africa Republic; b Democratic Republic of Congo.

Source : de Wasseige et al. (2012).

Industrial forest exploitation has been on the increase since the end of the civil war, in spite of the financial crisis of 2008 (Eba'a Atyi 2010). However, its impact was rather minimal with a total production never exceeding 500,000 m^3 until 2010 (Mertens and Belanger 2010). Yet, the share of the informal sector in the loss of forest cover is significant and would represent approximately four times the output of formal industrial forest exploitation (Lescuyer et al. 2012). Charcoal is a real concern in a context of poverty, because of the inability of the population to access alternative energy. According to Debroux et al. (2007), firewood and charcoal constitute 80% of the domestic energy source. The supply of large quantities of charcoal to the cities of Kinshasa, Kisangani and Lubumbashi has also had an impact on forest cover (Schure et al. 2011, 2012).

4.1.3 Sociopolitical insecurity and migration

The aim here is to identify key facts that can help understand how the context of sociopolitical instability influences the management of natural resources and of vulnerability in DRC. It is therefore not a complete inventory of the sociopolitical context of the country, but more of an identification of elements within this context in order to obtain an overview of the situation as regards vulnerability.

DRC covers a total area of 2,345,000 km^2 and shares between 9000 and 10,292 km (DGM 2009; MECNT 2009) of porous borders with nine countries (Box 3). Of these countries, Uganda, Sudan, Angola, the Central African Republic (RCA), Tanzania and Rwanda are familiar with regular political instabilities and could not fail to affect peace and security in the border regions shared with the Congo.

In DRC, instabilities of populations especially in the east of the country are largely explained by persistent economic crisis due to the externalities of the international context and to the bad governance (Vlassenroot 2003; NIZA 2006; Ngoie and Lelu 2010). The consequences in terms

Box 3. The borders of DRC with its neighboring countries

- 1544 km with Congo
- 1577 km with Central African Republic
- 787 km with Sudan
- 817 km with Uganda
- 213 km with Rwanda
- 205 km with Burundi
- 498 km with Tanzania
- 2140 km with Zambia
- 2469 km with Angola
- 42 km of Atlantic coastline

Source: General Directorate of Migration (DGM 2009)

of migration have been important during the past few years. According to the United Nations (UN 2013), the number of displaced persons increased from 1.8 million in early 2012 to more than 2.6 million a year after. The report of the Secretary-General of the UN to the Security Council (2013), on the implementation of the Framework Agreement for Peace, Security and Cooperation in DRC and in the Grand Lake region stated that the humanitarian crisis is no longer limited to the North and South Kivu regions. Since 2012, it also reached the provinces of Maniema and Katanga. The instabilities observed in Central African Republic (CAR) have now extended into Orientale Province and Equateur Province, which are hosting the central African populations because of the civil war. Thus, one can observe regular movements of people between DRC and its neighboring countries. The relevant figures are not negligible (see Tables 4 and 5).

These numerous displacements are not without impact on the management of natural resources and forestry. Provinces hosting high refugee numbers are those with important biodiversity and forest reserves (Table 6).

Table 4. DRC refugees in neighboring countries.

Country of destination	Number of refugees
Uganda	110,000
Rwanda	58,000
Burundi	40,000
Tanzania	63,000

Source: United Nations (2013).

Table 5. Foreign refugees in DRC in 2013.

Country of origin	Number of refugees
Burundi, Rwanda, Angola	140,000
RCA	50,000

Sources: United Nations Security Council (2013) and UNHCR (2014).

Table 6. Forest cover by province in DRC.

Province	Total area (km^2)	Forest area (km^2)	% Forest
Bandundu	295,658	120,000	9.7
Bas Congo	53,855	10,000	0.8
Ecuador	403,293	402,000	32.6
Eastern Province	503,239	370,000	30.0
Kasai Occidental	156,967	40,000	3.3
East Kasai	168,216	100,000	8.1
Kinshasa	9,965	-	-
Maniema	132,250	90,000	7.3
North Kivu	59,631	41,500	3.4
South Kivu	65,128	48,500	3.9
Katanga	496,865	10,000	0.8

Source: Chezeau (2003).

4.2 Vulnerable sectors and livelihood activities related to climate change

Vulnerability studies have been carried out in DRC using the framework of the Initial National Communication (INC) on climate change and the National Adaptation Program of Action (NAPA). Yet, there appear to be difficulties in vulnerability assessment in DRC both in political and governance arenas (Partenaires Globaux IPC 2012). Thus, the quality of NAPA and of the initial communications of 2006 and 2009 is questionable. Weaknesses in the methodology used for the realization of NAPA were noted. There was a problem of regional representativity: of a total of 37 documents consulted, 11 were on the DRC and of these, seven only dealt with the city of Kinshasa. From a population of 68 million inhabitants, only 2000 people were sampled. Data proposed by the National Communication on Climate Change of 2009 are also questionable because of the methodology employed.

Vulnerability studies in DRC were also limited as far as geographic coverage and other sectors are concerned. Analysis of elements taken from these various documents, including those derived from the literature, reveals huge concerns in the areas of agriculture, water resources and coastal zones, which lead to a high level of vulnerability in the areas of food security and health. The vulnerability approach can also be used both at the level of vulnerable livelihoods and of sectors sensitive to climate change. As such, sensitive sectors and vulnerable livelihoods were grouped for the rural zone.

4.2.1 Sensitive sectors in rural areas: Agriculture and water resources

Agriculture

Agriculture is the sector most vulnerable to climate change in DRC National Adaptation Programme of Action. As a matter of fact, agriculture occupies almost 70% of the active population of the country. The contribution of agriculture to GDP of DRC is growing. It has increased from 30.4% (Ministry of the Environment, 2006) to 49.5% since 2005 (CNI 2009). Its contribution to the national economy is evaluated in 2010 to 50% (UNDP 2010).

With the exception of the few initiatives of industrial agriculture, agriculture in the DRC is predominantly rainfed with a development of agricultural land valued at nearly 10% (Devey 2012). The political instabilities observed have strongly influenced the agricultural production in some provinces of the country. This is particularly the case with armed conflicts in the North and South Kivu, as well as in the center of the province of Katanga. These conflicts are at the origin of the high volatility of populations, and to a low sedentarization of the latter, with a real impact on agricultural production and, more widely, on the agriculture in the country. In addition to conflicts and extreme poverty in rural areas, climate risks and water problems have increased the vulnerability of the populations. The CPI report (2013) identifies the environmental hazards (climate disruptions: torrential rains and rains producing culverts, irregular rains and landslides) as having an impact on crops and livestock. As a matter of fact, the impact on the quality and quantity of crops is a direct one and influences the ability of people to feed themselves and to preserve their health.

Water resources

It is commonly accepted that the hydrological potential of DRC means the country should have no shortage of freshwater. A study conducted by the International Union for the Conservation of Nature (IUCN) from 1999 to 2003 has led to the conclusion that the water sector will be immune to the impacts of climate change up to the year 2100 (IUCN 2012). In effect, the country has a hydrological potential consisting of a basin estimated at nearly 3,822,000 km² and a reservoir of water covering 86,080 km² (DRC 1995). Yet, the issues relating to the water supply appear in the first and the second national communications as serious concerns. The problem of the availability of water arises more in terms of water quality, mainly in the major urban centers. This explains why the vulnerability studies carried out for the preparation of national communications have focused particularly on the cities of Kinshasa, Kananga, Mbuji-Mayi and Lubumbashi. The objective was, based on the state of the site and using the definitions of the hydrological and hydrogeological configurations, to measure the vulnerability in each case and to propose appropriate adaptation measures whose solutions could be extrapolated to all the related areas (CNI 2006). Yet, beyond the urban areas, access to water continues to be a concern and the poor people in rural areas also suffer from it. This position of the CNI, which first noted the water sector as one vulnerable to climate change, somewhat contradicts the conclusions of the study mentioned above. However, even if the water vulnerability to climate change in the DRC is ruled out until 2100, populations still have the perception that climate change increases the risk of water both in terms of availability and quality. As a matter of fact, the State already fails to provide populations with sufficient water quantity and quality (Beya 2012). So, climate change is just an added stress to an already vulnerable sector. Therefore, in the present case, the vulnerability is a direct consequence of the malfunction of the governance system.

As is the case in other countries of the Congo Basin, very few studies have been done in the DRC to establish how the number and type of trees affect the availability or unavailability of water resources and their quality. Yet, the trees play an important role in maintaining the structure of the soil, in the rainfall and the stability of the groundwater table. The loss of forest cover has impacts on rainfall, exposes the soil to damage and promotes the infiltration of groundwater, thus affecting the availability both in terms of quality and quantity. Despite the hydrological potential of high forest areas of DRC, the people who live there are experiencing difficulties in obtaining drinking water. Even when they have access to drinking water, doubts are raised about the quality of such water. Floods have occurred in certain areas as a consequence of more and more torrential rains that are involved in the transport and infiltration of elements that affect groundwater quality.

4.2.2 Vulnerable livelihoods: Food security and health

The debate on food security is conducted differently, depending on whether the discussion involves the urban or the rural environment, as shown in Table 7.

In the Congo Basin, poor populations are comprised mostly of those who have subsistence income from the forest (Ingram et al. 2010). Deforestation poses risks to the availability of resources and services derived from forests. In addition to this factor are the issues of insecurity. In addition to wood products, the forests of DRC also provide its populations with a range of other non-timber forest products (NTFPs). These NTFPs are either marketed or used by the forest peoples themselves and even by urban people. It emerges from an ACP-FORENET (2010) review that of 24 NTFPs identified, 16 are recognized as a priority for marketing and consumption in DRC. This illustrates the place of such products in the lives of people and the impact that a decrease in those products could have on the populations.

The issue of food security in the DRC is one of the major challenges of the last few decades. The embrittlement of the agricultural activity mentioned above, coupled with the sociopolitical factors, have had a widespread impact in the country, putting the food security situation in a serious crisis, according to the available provincial data (CPI 2012) (see Map 1).

With the exception of climate risk and sociopolitical insecurity, the part of deforestation in food insecurity in DRC is not clear from the available literature. A superposition of a food security map with that of the hot spots of deforestation in DRC shows the existence of a possible correlation between the two phenomena. As a matter of fact, the less the forest is degraded, the better the food security. This is because forest resources are used during difficult periods and when agricultural production has failed. However, this is not always the case for areas with high numbers of displaced populations.

4.3 Actors of adaptation policies: Structural centralization and conjunctural weaknesses

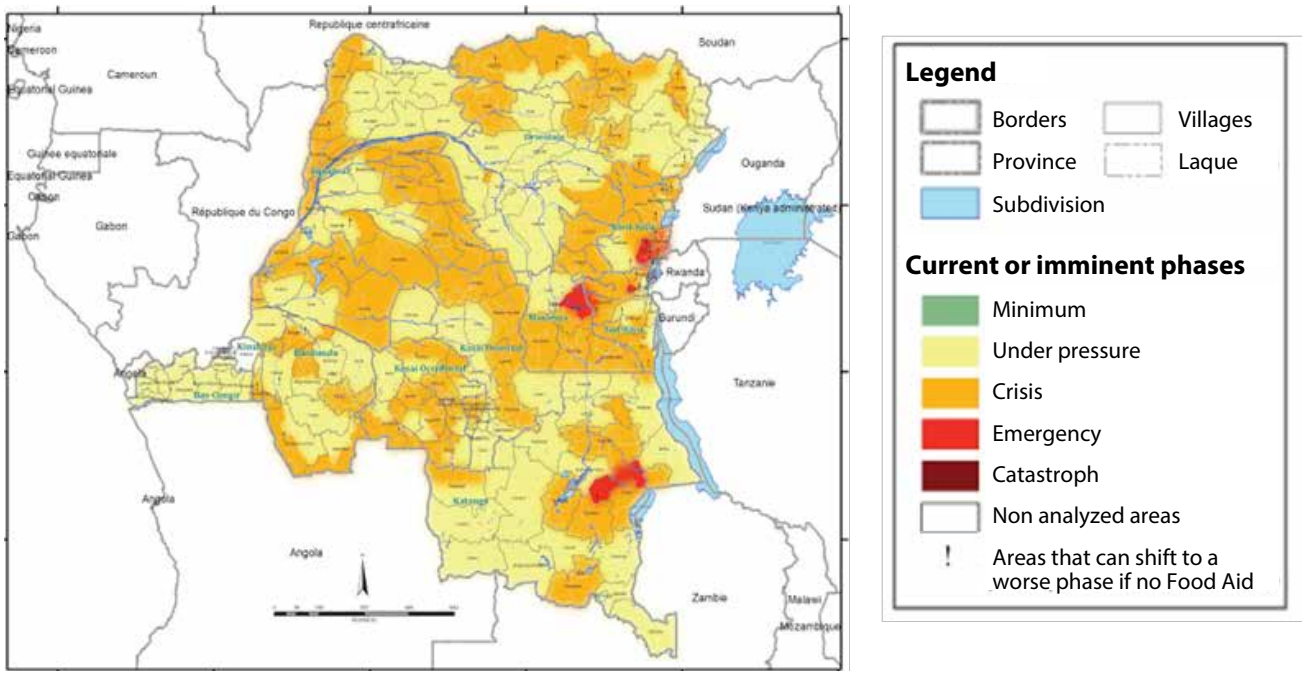
Several actors are involved in the field of climate change in DRC and include both national and international actors. The national actors are either governmental or nongovernmental and the international actors are either NGOs or governmental and intergovernmental organizations. A report on the interest of these actors in the area of climate change adaptation reveals a strong centralization around specific actors. The impact of this centralization on adaptation policies is visible in the country.

4.3.1 Concentration and superposition in actors' arena

An effort to develop the architecture of the political actors of adaptation to climate change in DRC reveals a dual centralization, both at the level of the territories and competencies. At the national level, the Ministry of the Environment, Nature Conservation and Tourism (MECNT) is responsible for forest and climate change-related issues. To this effect, it maintains the direction of sustainable development policy and represents the focal point of the United Nations Framework Convention on Climate Change (UNFCCC). Therefore, this Ministry has the responsibility of mitigation and adaptation issues and constitutes a focal point to UNFCCC. Outside of these institutional responsibilities devolved to the MECNT in the area of the fight against climate change, it remains difficult to identify other stakeholders directly involved in such policies. However, NAPA (Ministry of the Environment

Table 7. Distribution of average expenditure on food and non-food items per person and per year in DRC.

Location	Food	Non-food	Total/person/year
Urban	123,070 FC/ 131 USD	30,195 FC/ 32 USD	153,265 FC/ 163 USD
Rural	82,755 FC/ 88 USD	14,900 FC/ 16 USD	97,655 FC/ 104 USD



Map 1. Integrated framework for classification of food security, 8th edition, June 2012.

Source: Partenaires Globaux-IPC (2012).

2006) lists 54 partners and stakeholders (see Annex 1). This list, drawn up on the occasion of the drafting of NAPA, gives no details about the role of these different partners and stakeholders in the implementation of adaptation policy in the country. MECNT is therefore solely responsible for adaptation policies and guides the process at the government level.

The 'coordination' of the National Adaptation Program of Action is the sole responsibility of MECNT. Its origin is a source of confusion as regards the real nature of this coordination. For many political actors, it is responsible for the national coordination on adaptation. This confusion would find its explanation in the fact that in the current absence of a national coordination, the coordination is in reality that of the NAPA-ASA project, which is derived from the NAPA document. On the day of the study, this is the only materialization of the climate change adaptation policy in the country. Unlike the coordination of other programs of the MECNT, such as that of the Clean Development Mechanism (CDM) or that of REDD+ (created by the Decree from the Prime Minister's offices, No. 09/40, of 26 November 2011 and incorporated according to article 12 of persons appointed by ministerial decree among the officials of the MECNT on proposal of the Secretary-General), the coordination of the NAPA-ASA project is made up of a team recruited after a call for tenders by the United Nations Development Program (UNDP). Thus, the tender process was not instigated by officials of the Ministry of the Environment, as is the case for other projects coordinated by the Department (such as the national coordination of REDD+).

The establishment of the NAPA document and the associated project has seen the contribution of UNDP, which occupies a central position beside the MECNT on adaptation issues for its active involvement in the drafting of the NAPA document of the country. Yet, with the exception of actors whose activities are carried out under the supervision of the MECNT, it remains difficult to identify other actors in the areas of adaptation within the country. This difficulty can be partly explained by the country's isolation, which makes it difficult to carry out adaptation exercises. It is also clear that a lot of activities, although not labeled as 'adaptation activities,' indirectly respond to shocks induced by climate change in various sectors and livelihood activities of the population in DRC, and could have been used to inspire the drafting of NAPA.

4.3.2 Concentration, superposition and meaning of adaptation policies

In the context of DRC, the concentration of political actor networks on adaptation around the Ministry of the Environment, the NAPA-ASA project and UNDP explains the low level of progress of the political process in the country. Contrary to CDM and REDD+ which have earned notoriety, the political process of adaptation to climate change is very slow. As such, the coordination of the project NAPA-ASA is the main materialization of the government's determination in the area of adaptation to climate change (Figure 2). This lack of visible institutional anchorage of the adaptation process in the country means that it is impossible, at least for the time being, to find an official interlocutor specific to the adaptation to climate change. Similarly, the absence of coordinated action in the ranks of the nongovernmental actors in the area of adaptation demonstrates the need for structured actions to overcome the constraints posed by the large internal distances within the country, the fact that it is landlocked and the absence of relevant funding for the adaptation process.

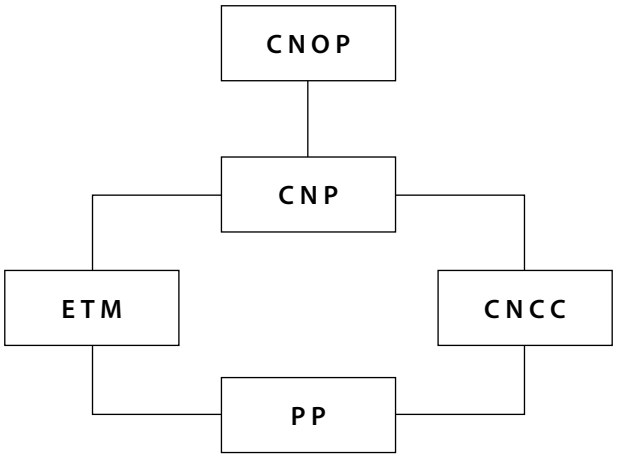


Figure 2. Organization chart of the NAPA team.

Note: CNOP = Project National Steering Committee; CNP= National Project Coordinator; ETM = Multidisciplinary Technical Team; CNCC = Climate Change National Committee; PP = Stakeholders).

Source: PANA (2006).

4.4 Political process of adaptation to climate change

4.4.1 Political events surrounding adaptation to climate change

Contrary to mitigation, which was at the origin of a strong mobilization in the country, the political process surrounding adaptation to climate change in the DRC has not experienced major progress. It is nevertheless possible to identify some events that have marked the infancy of the process (see Table 8). These events are in close relationship with the national process of combating climate change. They take the form of political meetings at the national level or simply in texts of law taken in favor of adaptation to climate change.

4.4.2 Financing of the adaptation to climate change

The funding of adaptation to climate change is one of the essential conditions for its success, especially in a country characterized by a growing impoverishment. DRC is one of the central African countries identified by the UNFCCC as particularly vulnerable, due to its slow economic development and of limitations of its capacity to adapt and to protect the country against the impacts of climate change. An effort to map adaptation funding is based on the affirmation of the existence of funding for the fight against climate change. Adaptation funding is largely dominated by the international actors, especially the Global Environment Facility (GEF). Funding has been initially granted for the elaboration of the initial national communication, and then for the elaboration of the NAPA.

The elaboration of DRC's second initial national communications to UNFCCC in 2006 and 2009 benefited from the financial support of the GEF. In addition, GEF also put in USD 200,000 for the elaboration of PANA. This funding was provided within the framework of the convention intended to support developing countries in the process of combating climate change. DRC was also the only country, in the year 2009, to benefit from additional funding of USD 3.1 million for the implementation of its PANA through the project: Strengthening the Capacity of the Agricultural Sector in Democratic Republic of Congo in Order to Plan and Respond to Additional Threats Posed

by Climate Change in Terms of Security and Food Production, called project NAPA-ASA. This project received funding from GEF through the Least Developed Countries Fund (USD 3,000,000), from the Government of the DRC (USD 3,000,000) and from UNDP (USD 50,000). This project was intended to increase capacity-building and to improve the resilience of the agricultural sector in the country.

In addition to this funding, private funds intended for more specific projects outside the circuits of the framework convention and the national process are also available. They are summarized in Table 9.

Table 9 shows that only one project received a financial contribution from the Congolese Government at the time of this study. This trend is not specific to DRC. As a matter of fact, as in DRC, the low level of funding in the area of adaptation is widespread in other African countries. The effects of funding the adaptation process on the national policy remain mixed. To this day, no country of the Congo Basin has been able to access the Special Fund for Climate Change. It is apparent from the report of the NAPA-ASA project that, with the exception of a few contributions in kind and in expertise, the share of sustainable funding by the national government remains difficult to identify in this effort to establish institutions in favor of the adaptation to climate change (NAPA-ASA 2013). If NAPA-ASA remains to this day the only adaptation project benefiting from government support, its funding represents only a small proportion compared with support allocated to mitigation processes in the country.

Table 8. Political events in connection with the adaptation to climate change in DRC.

No.	Designation of the event	Date/ Year	Main decision
01	Ratification of the UNFCCC[a]	1994	Commitment to the efforts to fight climate change from the international community
02	Forest Code of DRC[b]	2002	Law on the Forest Code
03	First National Communication on Climate Change	2006	Status of vulnerability and of measures to combat climate change
04	Poverty Reduction Strategy Paper (Version 1)	2006	
05	NAPA[c]	2006	Identification of national efforts to change climate adaptation
06	Launch NAPA-ASA[d] project		Completion of studies about link with adaptation of the agricultural sector to climate change
07	Second National Communication on Climate Change	2009	
08	Decree No. 09/40	2009	Creation of the National Coordination REDD+
09	Poverty Reduction Strategy Paper (Version 2)	2011	
10	Correspondence, 563/SG/ECN/2012 The country director of the system of the United Nations of UNDP[e] DRC	2012	Expressions of interest for the formulation of the National Adaptation Plan of Action
11	Interministerial meeting for the roadmap of the National Climate Plan	2013	Launching of the National Climate Plan project

Note: a UNFCCC = United Nations Framework Convention on Climate Change; b DRC = Democratic Republic of Congo; c NAPA = National Adaptation Programmes of Action; d NAPA-ASA = Project for Capacity Building in the Agriculture Sector and Food Security; e UNDP = United Nations Development Programme.

Table 9. Projects on climate change labeled 'adaptation'.

No.	Designation of the project		Financing (USD)	Partners
1	Strengthening the capacity of the agricultural sector as an adaptation strategy to climate change for better production and food security	2010–2014	GEF[a]: 3 million UNDP: 50,000 Government DRC: 3 million	GEF UNDP MECNT INERA[b]
2	Draft Coastal Zone	In progress	//	MECNT[c]
3	Improvement of the resilience of women and children to climate change	2014–2018	UNDP: 400,000 GEF: 4,300,000	UNDP GEF
4	Project COBAM-Lukolela[d]	2013–2015	ADB/ECCAS[e]: 270,000	RAFM[f] CIFOR
5	CoFCCA[g] (adaptation project)			UNIKIS[h] CIFOR
6	CADRU project (Center of Adaptation to Climate Change and Rural Development) located in the Lower Congo	//	//	//
7	Socioeco project (agriculture, reforestation, diversification of income) in the Lower Congo and Ecuador	//	//	//
8	Women and Environment			

Note: a GEF = Global Environment Facility; b INERA = Institute for the Environment and Agricultural Research; c MECNT = Ministry of Environment, Nature Conservation and Tourism; d COBAM = Climate Change and Forest in the Congo Basin: Synergies between Adaptation and Mitigation; e ADB = African Development Bank/ECCAS = Economic Community of Central African States; f RAFM = African Model Forests Network; g CoFCCA = Congo Basin Forest and Climate Change Adaptation; h UNIKIS = University of Kisangani; i CIFOR = Center for International Forestry Research

Sources: Compilations of the author.

5 An attempt to reconstitute policy options for adaptation to climate change of the forest sector

The process of establishing a national strategy for adaptation in the DRC is still incomplete on three points: the objectives, instruments and the institutions responsible for its management. The dispersion of efforts to respond to climate shocks, particularly in the forest regions, coupled with the structural and conjectural constraints mentioned above, suggest that there should be reconstitution policy options for adaptation to climate change. To that end, a methodological approach of the study should be appropriate. Identified options will be polished at the time that policy options in the development of a national strategy for adaptation in DRC are chosen.

5.1 Agroforestry and adaptation to climate change

Agroforestry refers to an ecological dynamic that is based on a system of management of natural resources which, through the integration of trees in plantations and landscapes, proceeds to the diversification and support of production with the aim of increasing social, economic and ecological benefits (Leakey 1996). Thus, agroforestry is identified as an opportunity by which to effect climate change adaptation, a necessary effort because of the importance of the expected impact of climate change on agriculture, livestock and fisheries (IPCC 2001). As such, policies aim to encourage planting and selective management of the process, which is an asset in the improvement of the adaptive capacity of forest-dependent peoples (Solomon et al. 1996; Verchot et al. 2007) because of the importance of trees in climate change and their role in the daily life of forest peoples. Appropriate policies are therefore necessary to ensure success in such initiatives.

The agroforestry policies in place in DRC are complex, offering exciting goals that unfortunately will not be reached because of the absence of appropriate instruments and strong institutions. In his attempt to rebuild these policies, Dkamela (2012) identifies eight essential points (see Box 4). A review of the results of this exercise, conducted from the perspective of public climate policy shows that, in the context of this 'poor country with enormous potential,' agroforestry policies represent an opportunity for adaptation to climate change. The policy makers and sectoral planners are considering several types of activities, both at the country and the provincial levels. The potential of DRC in agroforestry is real, because of the climate. However, the sector is vulnerable due to some constraints, which are summarized in Table 10, by sector of envisaged policy.

5.2 Forest, energy policy and climate change adaptation

There are two main sources of energy in the Congo: hydroelectric energy for the production of electricity and wood for domestic energy. While hydroelectric energy is important in characterizing the vulnerability of development sectors, wood

Box 4. An attempt to reconstitute policy options for agroforestry in DRC

1. Production and management of trees
2. Access and control over the land and trees
3. Measures related to harvesting
4. Measures related to postharvest matters
5. Development of markets and enterprises
6. Taxation and levies
7. Research, education and outreach
8. Coordination and coherence

Source: Dkamela (2012).

Table 10. Risks and opportunities for adaptation to climate change in the field of agroforestry policies.

Policy envisaged	Opportunity	Constraint to implementation	Links to policies for adaptation to climate change	
			Risk	Opportunity
Production and management of trees	• Existence of various types of agroforestry activities	• Absence of provisions on the production of plant material from agroforestry trees • Lack of clarity on the inclusion of agroforestry in a regime of afforestation and reforestation oriented toward forestry • Difficulties in the implementation because of poor knowledge about existing laws and regulations	• The absence of knowledge about implications can lead to the maladaptation of species.	• The selection of appropriate species can help meet the shortfalls caused by climate change
Access to and control over land and trees	• Recognition of the rights of enjoyment of communities for domestic purposes • Existence of property rights on the trees planted in the framework of arboriculture	• Lack of recognition by the legal entities of local communities • Risks associated with the superposition of land, mining, agricultural and forest titles, with priority given to mining • Sociocultural barriers to land access for silvicultural activities • Low levels of institutionalization of mechanisms that manage conflicts over land and natural resources	• The lack of supervision for the access to, and control over, land and trees limits the development of private forestry, especially as the ownership of the planted trees remains theoretical	• The recognition of human rights enjoyment gives an opportunity for access to the land, trees and forest resources
Harvesting measures	• Permissions and limitations for the harvest of forest products (seasons, species, quantities) • Existence of guidelines on the exploitation of community forests	• Lack of framework for the exploitation of trees planted on farmland	• Maladaptation of ecosystems • Wrong answer in terms of food security	
Postharvesting measures	• Presence of objectives for the promotion of food processing industry extensible to agroforestry products	• Harvesting measures concern only forest products whereas postharvest measures are only for agricultural products and not for measures on agroforestry products		• A better framework for the postharvest constitutes an opportunity to better regulate access to forest resources

continued on next page

Table 10. Continued

Policy envisaged	Opportunity	Constraint to implementation	Links to policies for adaptation to climate change	
			Risk	Opportunity
Markets and enterprises development	• Existence of political will and clarity of responsibilities in the decentralization of the agricultural sector • Existence of binding statements in favor of financial and tax systems adapted to small and medium agricultural enterprises	• Weak financial, institutional and technical capacity throughout the country • Lack of policy for the promotion of certification systems of agroforestry products • Very low development of measures related to access and benefit sharing (ABS)	• A lack of control over the market and enterprises may exacerbate the needs of communities and make the transition to a market economy cumbersome as regards resources	• Production of the development opportunities of markets for the sale of goods and services for the benefit of the adaptation
Fiscality and taxes	• Difficulties in grasping the advantage of the fiscalization of essential products to benefit local livelihoods	• Weak institutional and legal environment • Existence of illegal taxation practices	• Overcautiousness as regards income • Problems of equity in the sharing of income	
Research, education and extension	• Missions clearly assigned and decentralized • Existence of the Agricultural Council and rural management (Carg-O Mounts)	• Crisis in the research sector • Limitation of research initiatives in agroforestry • Crisis in the National Extension Service	• Lack of reliable data on vulnerability • Poor circulation of reliable existing data	• Identification of adaptation options and extension
Coordination and coherence	• Shared competences and decentralization in agroforestry • Existence of a few arenas of dialogue to serve as coordination in agroforestry	• Overlap of responsibilities • Decentralization process unfinished	• Conflicts of competence among various administrations in charge of forests and of agriculture	• Opportunities for the integration of adaptation policies in development policies

Source: Dkamela (2012).

energy helps illuminate the relationship between peoples and forest. The use of wood energy is a traditional practice of the populations of the country. For these populations, gas, kerosene and electricity are relatively luxurious sources of energy for domestic consumption. Because of the dependence of these populations on wood for energy, wood can serve as an indicator in the assessment of the impact of policies on tree management and the vulnerability of these populations to climate change. As a matter of fact, while wood is consumed directly by the local populations for heating, charcoal is predominantly intended for major cities (such as Kinshasa and Kisangani), where demand has grown over the years, due to the increase in the population. The dependence on fuelwood and charcoal for daily cooking is 87% in Kinshasa and 95% in Kisangani (Schure et al. 2011). These percentages show a near-total dependence on wood for energy. In remote areas, wood is the only source of energy.

In 2009, the total production of wood energy in DRC was estimated at 54.7 million tonnes (75.4 million m^3) representing 94% of the total production of round wood (Schure et al. 2012). Wood energy comes almost entirely from remote communities far away from large cities. Transport to cities is done both by road and by water. Charcoal is from different land use (see Boxes 5 and 6).

Box 5. Provenance of wood energy by land use type for the supply of the city of Kinshasa

Forests transformed into agricultural land	52 %
Noncultivated forests	32 %
Other types of land use	16 %

Source: Schure et al. (2011).

Box 6. Examples of the sources of charcoal distributed in Kinshasa

Plateau de Batek	43 %
Province of Bas Congo	34 %
Congo River (more far away provinces)	23 %

Source: Schure et al. (2011).

Approximately 300,000 persons work in the wood energy sector (Schure et al. 2011). The marketing of fuelwood and charcoal therefore constitutes an important source of income for local populations of forest areas. Although their share in the total distribution of income derived from this activity seems minimal compared with that from their production-to-consumption way of life, rural populations remain, however, dependent on these low incomes. The money thus earned is used to meet the basic needs of the family (Schure et al. 2011). It is therefore certain that any initiative to limit the access of these populations to the resource without providing them with an immediate and sustainable alternative would increase their vulnerability by limiting their income. This can happen if access of the population to the resource is limited or if the resource becomes rare for any reason, be it climatic or not.

The Forest Code and the Land Code constitute the two main texts that govern the management of wood energy in DRC. Article 58 of the Forestry Act of 2002 authorizes the production of charcoal in the forest. The options drawn from these documents constitute opportunities for the sustainable management of forests for the production of this resource. However, application of the texts is very limited and leaves room for customary law, which applies in the majority of cases (Schure et al. 2011). While the exploitation of wood energy substantially contributes to deforestation and particularly forest degradation, it is however important to control this phenomenon without increasing the vulnerability of the populations who depend almost entirely on wood for their energy needs. Reduced access to the resource, both for direct consumption and for sale, without providing immediate and lasting alternatives should be avoided. While improved stoves have been promoted in order to reduce the use of wood energy to save money, in 2012, only 3.2% of households in the cities of Kinshasa and Kisangani had access to improved stoves (Schure et al. 2012).

5.3 Policy of access to non-timber forest resources and adaptation to climate change

Unlike the management policy for timber, that for non-timber forest products is not very clear in the forest policy of DRC. An attempt to reconstitute

this resource focuses on the production chain, including marketing and measures intended to ensure sustainable management. Forest resources, including non-timber forest products (NTFPs), constitute food resources for the Congolese populations and a source of potential revenue after agriculture. For both classified and protected forests, the principle of free access applies to the resources within the limits of the law of 29 August 2002 establishing the Forest Code of DRC. Under the terms of Articles 37–39 and 41 of this law, the people living within and in the vicinity of forests, can, under the terms of the rights of use, access the forests for food, medicinal and artisanal purposes. However, the products harvested under this specific right cannot be marketed. An exception is made, however, for products exploited on the authorization of the governor of the province. Yet, one of the criticisms made about these legal provisions is that no criteria exist for choosing which products are allowed to be marketed (REM 2011). In addition, the other modes of exploitation of forest resources are accompanied by financial conditions, which makes it difficult for forest peoples to get access to forest resources.

5.4 Migration policy and adaptation to climate change

The situation created by the political instability in DRC has a direct impact on the conservation of resources and the adaptation efforts of the population to changes in the availability of these resources and the capacity of forests to provide social and ecosystem services. This situation creates an environment that is unfavorable to the formulation and implementation of appropriate institutions for the adaptation to climate change. However, it remains difficult to identify specific accompanying measures: the only available measures are those related to the disaster management policy, including population fluxes from other neighboring countries at war, as well as measures related to the movement of populations within the Congo.

5.4.1 Overview of the migration policy in DRC

The management of migratory fluxes in DRC is a concern as reflected in item 157 of Section 2.3.3.4 of the poverty reduction strategic paper, related to poverty and to habitats (Gemenne et al. 2013). Under the terms of this item, 'the destruction of livelihood is linked to the successive wars that have particularly struck the east region of DRC, with migrations of populations that followed.' In response to this concern, the same document provides in its point 386, 'the establishment of a national program of migration for development,' based on the experience of the Migration for Development in Africa (MIDA) program. However, the linkages between migration and the observed changes in ecosystems of DRC have not drawn much attention (Gemenne et al. 2013). In this regard, DRC has not ratified the African Union Convention on the protection and assistance to internally displaced persons in Africa (2010), nor to the International Convention of 1989, against the Recruitment, Use, Financing and Training of Mercenaries. Although the country has already ratified the treaty of the Great Lakes region and its protocols, implementation of these instruments is very low. As a consequence, there is an absence of information to assist in the formulation of appropriate solutions to the problems posed by the migration in the context of crises, and of climate change. One of the rare initiatives to respond to this need is the project entitled Facilities Intra-ACP for Migration. This resulted in report no. 17 of October 2013, which examines the relationship between the degradation of the environment and the displacement of populations in DRC. It shows that, in order for out-migration to become a genuine strategy for adaptation to climate change, the country should also consider a strategy for counterbalancing erosion in urban areas by the temporary and definitive evacuation of populations. A similar strategy could also be used in the case of lava flows or large-scale human disasters with the establishment of programs that provide incentives for voluntary migration (Gemenne et al. 2013).

5.4.2 Migration and environmental adaptation policy in DRC

Just as sociopolitical and environmental crises are at the heart of migration, forest and land degradation also result in the migration of populations. While policies to combat land and forest degradation depend solely upon the competency of the Ministry of the Environment, the policy for the management of land use is however divided among several ministerial portfolios: Ministry of Agriculture, Ministry of Habitat and Land Affairs, Ministry of Mines and

Rural Development, Ministry of Planning and Energy. So far, however, it remains difficult to identify a coherent national policy for the effective, rational and effective management of the land in the country. The immediate consequence is the difficulty faced in developing an appropriate policy for adaptation to climate change and to migration.

Environmental migration falls in the category of forced migration. This means that populations in crisis areas must move to more stable areas for their survival. Such migrations are massive in nature, as all the members of a group are affected. Yet, it has become more and more difficult to make a distinction between voluntary and forced migration in DRC due to the complexity of the reasons for exile and the constant changes that affect the reception of migrants. The same is true of the development of migration policies (Lassailly-Jacob 2009). In the case of climate change, it is changes in the environment that force people to migrate. Ultimately, there is no specific policy for environmental migration management in DRC. This gap therefore should be urgently filled.

6 Development and climate policies: *Ex situ* issues regarding the integration and coherence of adaptation and REDD+

No assessment of the integration and coherence of climate and development policies has been made in the context of DRC to date. We will first deal with this before reflecting on potential synergies within the same climate policy.

6.1 An overview of the state of knowledge of the integration and coherence of climate policy and sectoral policies for development

Integration of policies entails taking into account the various sectors of developmental, environmental and nonenvironmental factors in the political process. It also refers to the efforts by policy makers to aggregate the possible consequences of observed changes in the climate and the assessments of policies, with a view to minimizing the contradictions of climate policy with other sectoral policies (Underdal 1980; Van Bommel and Kuindersma 2008). The context of DRC is marked by the vagueness of the climate policy. It is noted that the integration of climate policy with development policies in DRC remains low and is characterized by a problematic dispersion of decision centers in the first Poverty Reduction Strategy document (DRC 2006), there was no mention of climate change at all. However, the next one, published in 2011, made climate change a key concern of the country's development policy for the years to come. This document states that 'to better protect the environment and combat climate change, the government intends to focus on: … the integration of the environment and climate change in the sectoral strategies' (DRC 2011). It is therefore important to examine the state of this integration. Particular interest will be on agricultural, energy, forest and investment policies, which are presented as the current sectors of development of DRC and whose sensibility to climate change has been proved.

6.1.1 Development of the agricultural sector and climate policy

About 70% of the population of DRC is employed in the agricultural sector. The development of this sector therefore remains crucial for the fight against poverty. According to the Ministry of Agriculture (MINAGRI 2011a), a 10% increase in the annual agricultural production would help reduce by nearly 7% the number of people living under the poverty line in the country. At the same time, the agricultural sector is recognized as being vulnerable to climate change. Therefore, it is necessary to integrate responses to changes already observed and to anticipate the irreversible consequences of not acting against climate change by developing adaptation strategies for the agricultural sector and for the slash-and-burn agriculture. The agricultural policy of DRC takes its source in point 14 of the constitution of the Republic. It is materialized in a Note of Agricultural Policy published in April 2009. More recently, the country adopted (in September 2013) the National Program of Agricultural Investment (PNIA) covering the period of 2013 to 2020. The Note is built around the objectives of food security and poverty reduction through: the improvement of access to markets and to the added value of agricultural productions; the improvement of the productivity of the agricultural sector; the promotion of decentralized financial systems that adapt to the nature of the activities of the sector; and the strengthening of the technical and organizational capacities of public and private institutions to support agricultural production (MINAGRI 2011b).

At the time of the preparation of this Note, discussions on the questions of climate change were already on the agenda. Climate issues were then expected to be included in the document. However the term 'climate change' only appears once in the *Note* in connection with the mobilization of

support from donors. That is also the case in the draft document of the agricultural code of 2008, as well as the act of 2011 on fundamental principles related to agriculture; these make no mention of climate change and its potential risks to development and the fight against poverty. These documents only make reference to the protection of the environment.

The National Program of Agricultural Investment (PNIA) of DRC is at the moment the only reference document on the integration of climate change concerns into agricultural policies. The document recognizes that the efforts of agricultural expansion will have negative impacts on the forest cover, among others. A set of measures is envisaged from the perspective of mitigating these negative impacts. The measures aim to include mapping of the vulnerability of natural resources and the promotion of cultivars adapted to climate change (PNIA 2013). The PNIA is built around five programs, of which the last is related to climate change adaptation. Its components are: (i) promotion of integrated soil fertility management (ISFM); (ii) support for the establishment of more resilient agroforestry systems; (iii) watershed management and the establishment of anti-erosive measures; (iv) measures to accompany the REDD+ process; (v) strengthening of agrometeorological centers; and (vi) establishment of mechanisms for monitoring and preventing climate risks.

No goal is therefore defined with sufficient clarity in relation to the support of the risks related to climate change in the field of agriculture, except the effort that gave rise to the drafting of the Guidance Document on the Reduction of the Impact of Subsistence Agriculture on the Forest, published by the Ministry of Agriculture and Rural Development (MADR); the Ministry for the Environment, Nature Conservation and Tourism (MECNT); and the National Coordination REDD (CN-REDD). Therefore, the integration of climate change in the policy document is still in the early stages and still has a long way to go. However, there are many initiatives in the country that aim to develop an agricultural sector more resilient to climatic variability and change. To date, the official policy defined by the government is conducted under the leadership of the Directorate of Sustainable Development of the Ministry of Environment, Nature Conservation and Tourism and is implemented within the framework of NAPA. In addition, swidden agriculture can further increase the vulnerability of local populations; one consequence of this is that the absence of its direct integration in the policy makes it difficult to reach the objectives of poverty alleviation and food security envisaged in the area of agriculture in rural areas.

6.1.2 Development of the energy sector and climate policy

The energy sector in the DRC can be divided into two categories: electrical and domestic energy. The first is marked by a very low level of access by the general population, and the second by a strong use of wood energy for daily cooking. One can easily understand that, for a country with the largest water catchment area of Africa and the second largest hydroelectric potential of the world, the issue of electrical energy in relation to climate change is not a concern. This could explain the absence of a call for restraint in the documents in connection with the management of energy in the country.

However when one is interested in energy use in the home, wood energy is used by 99% of the rural population of DRC for cooking and for the production of charcoal. Many people derive direct and indirect benefits from the production and marketing of wood energy, which constitutes its own sector. In addition, as regards the clearing of portions of the forest for firewood and charcoal production, the cleared spaces are used for subsistence agriculture.

This dynamic of production, utilization and marketing of wood energy is important for the socioeconomic development of rural populations who depend on it. Like the electric power sector, that of wood energy enjoys no special policy. However, the wood energy sector is vulnerable to climate change and the political dynamics that it induces at national as well as at international levels. On the one hand, climate change is affecting the forests and so entails taking measures to protect it. On the other hand, the strong dependence of local populations on the forest resources affects the lifestyles of the rural populations. The risks of maladaptation may therefore be envisaged.

6.1.3 Forest and climate policies

The DRC does not have a document on forest policy yet. An attempt at mapping this policy in

the absence of a specific document requires that the international, regional and national commitments in favor of forests are revisited. To date, DRC has ratified 28 international conventions related to the protection of the environment. At the level of central Africa, it is a member of the Central African Forest Commission (COMIFAC) and ratified the treaty on 31 December 2009. The COMIFAC treaty was followed by other legal commitments, including the Regional Agreement on Forest Control in Central Africa; regional guidelines related to the sustainable management of non-timber forest products of plant origin in Central Africa; and regional guidelines for the participation of local and indigenous people and nongovernmental organizations to the sustainable management of the forests of Central Africa. In addition, DRC is also engaged in a voluntary partnership agreement (APV-FLEGT) with the European Union (EU) and CITES; the decree of implementation has been made available under the technical direction of the Congolese Institute for the Conservation of Nature (ICCN). Along with these initiatives, which attempt to define the objectives and the formal institutions of forest management, there is however a low dynamic around the aspects related to informal forest exploitation. After the adoption of its forest code of 2002, in 2003 DRC defined a priority agenda for the revival of the forestry sector. Although the Forest Code recognizes in the first paragraph of article 1 that the forest can have an impact on climate (DRC 2002), there is no further mention of climate change in the Forest Code. The policies defined by the priority agenda have strong economic purposes (Mpoyi et al. 2013) and do not include 'forests for adaptation and adaptation for forests,' as defined by Locatelli et al. (2010). This observation remains valid for the priority agenda of 2003, which was built around measures to correct and to protect the forest against the adverse effects of institutions inherited from the past: to regulate the timber industry; develop and implement the broad vision and multifunctional forests; and to rebuild the institutions by strengthening national leadership.

The integration of forest policies and climate is a necessity in the context of negotiations with a view to the insertion of forest management in a post-Kyoto agreement to combat climate change through REDD+. DRC is committed to this process alongside the other countries of the Congo Basin and the COMIFAC. Accordingly, it started its REDD+ process in 2009, aiming to adhere to a clearly defined timeframe (see Figure 3).

On the occasion of the REDD+ process, many initiatives have emerged both at national and local levels with the involvement of actors from various national and international organizations. In DRC, REDD+ is part of the Forest Carbon Partnership Fund of the World Bank and of the UN-REDD, which approved the R-PP countries in 2010. In DRC, the Directorate of Sustainable Development within the Ministry of the Environment is in charge of the REDD+ process. This directorate ensures the national coordination of REDD+, created by ministerial decree in 2010.

As a result of its R-PIN and R-PP, the country has produced its strategic framework, which is built around the major pillars of development such as agriculture, energy sustainable management, the conservation of carbon stocks, governance and demography. The multidimensional nature of the issue and the dynamics observed suggest an integration of climate issues, at least in the forest management policies. The fact that

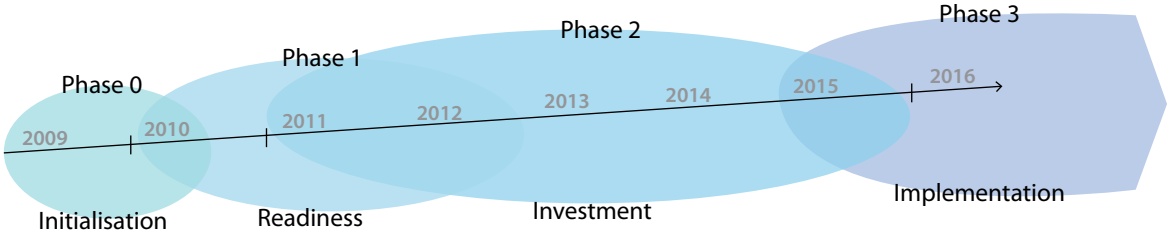


Figure 3. REDD+ timeframe in Democratic Republic of Congo.

Source: RPP, DRC (2010).

Table 11. Assessment of GHG emissions and sequestration (in Gg Eq CO_2).

	Emission CO_2 (Gg Eq CO_2)	Sequestration CO_2 (Gg Eq CO_2)	Balance sheet CO_2 (Gg Eq CO_2)	Emissions CH_4 (Gg Eq CO_2)	Emissions N_2O (Gg Eq CO_2)	GHG balance sheet (Gg Eq CO_2)
1999	497,322.00	-548,068.00	-50,746.00	50,750.00	9,238.00	9,242.00
2000	275,963.11	-562,679.74	-63,216.63	51,657.00	6,785.46	-4,774.17
2001	146,700.00	-500,357.10	-189,857.20	47,582.25	6,362.30	-135,912.65
2002	320,927.65	-496,998.80	-176,072.15	47,697.25	6,317.69	-122,057.30
2003	377,841.53	-495,334.02	-117,491.49	47,904.50	6,362.30	-63,224.69

Source: Ministry of the Environment (DRC 2006): NAPA.

the same ministry is in charge of both forest issues and climate change at the same time should be an advantage. In addition, the presence of REDD+ in the second version of the Poverty Reduction Strategy Paper in 2011 is significant for new guidelines.

6.2 Meaning of the context of integration and coherence as regards synergies within climate policy

The previous sections have pointed out that the integration within climate policy in DRC is marked by efforts stimulated mostly by international actors. Although integration of climate change into development policies is still at the early stage, the coherence between climate policy and development policies is experiencing a lesser dynamic. Therefore, it is appropriate to consider the reasons for the insufficient integration and for the absence of coherence between climate policy and development policies in an effort to build synergies within the climate policy in DRC. To do this, it is important to consider the debate on greenhouse gas (GHG) emissions in the development context and the contribution of the various sectors of development activities to the vulnerability of rural communities in forest areas.

The two initial national communications of DRC to UNFCCC have identified a number of GHGs, one of which is CO_2. However, although the context of poverty and increased development prospects carries with it a high potential of GHG emissions, the reality of development remains far from realizing this potential. The two documents mention that the main activities of the energy sector that contribute to climate change are transport (because of exhaust gases), and the combustion of fossil fuels (crude oil and derivatives, mineral coal) and wood (firewood and charcoal). This sector emits CO_2 and other gases. In the agricultural sector, agriculture is also identified as a key source of CO_2 emissions and other gases. In forest ecosystems, the conversion of forests and prairies to other land uses is identified as the main sources of GHG emissions (CNI 1 and 2). In general, emissions of GHG in DRC have experienced growth between 1999 and 2003. However, carbon sequestration has remained constant, thus giving rise to a negative balance (Table 11). In fact, as far as GHG emissions are concerned, there are two possible scenarios (personal communication from FAO/Catholic University of Louvain (UCL) team, 2013[1]). In the case of population growth with a reduction of forest cover, the GHG emissions of the sector will continue to grow, especially if alternatives to sequestration are not found. In the case of forest conservation (which would mean that DRC remains a forest country for the next few decades), there will be a reduction of GHG emissions in the sector, which in fact will increase sequestration. However, considering the high dependence of the rural population on slash-and-burn agriculture leading to changes in forest cover, it could be postulated that most emissions in the rural sector in DRC are caused by rural populations. The challenges relating to the development of the rural sector are therefore to be considered if we would like to reduce emissions in this sector.

1 FAO and Catholic University of Louvain produced a project report in 2013 titled 'Study on the modeling of spatially explicit risk of deforestation and degradation of forests in the Congo'.

7 Adaptation and REDD+: In situ issues for synergies

The efforts devoted to fight against climate change in DRC explain the existence of many policies. These policies provide opportunities to ensure that institutional arrangements are in place that are likely to jointly benefit mitigation and adaptation to climate change. However, current policy structures pose risks for the efforts undertaken.

7.1 Opportunities for institutional arrangements

Over several years, many mechanisms have changed DRC traditions in terms of management of climate risks. After the introduction of CDM and REDD+ as efforts to mitigate climate change, the DRC has assigned itself adaptation missions. A set of dynamics are today in progress and tend to harmonize the actions related to climate change.

7.1.1 Coordination efforts for climate change initiatives

The national plan on climate was created after noting the dispersion of efforts of different actors on the national stage in the fight against climate change and because of the absence of a national vision on the subject. The objective of this plan is to structure, coordinate, target, supplement, make projections and to mobilize the funds for the fight against climate change. The process of its establishment is composed of three stages: the first consists of inventories and assessments, the second consists of a proposal for a model climate plan for the DRC and the third consists of national programs of sectoral emissions reduction and adaptation to climate change, including the strengthening of institutions (unpublished report, MECNT 20132). To oversee this plan, a national council on climate change was created and is chaired by the Prime Minister, with the participation of all sectoral ministries.

Next to the national plan on climate change, an initiative more specific to the adaptation to climate change was brought by the Climate Change Division of the ministry in charge. This initiative, known as the Process of the Economy of the Adaptation to Climate Change, is the initiative of the Secretariat General of the MECNT and has as its institutional anchorage the Division of Sustainable Development, which was initially in charge of the synergy between the different Rio conventions through its coordination, monitoring and implementation. The objective of the adaptation process as regards economic matters is to acquire the relevant data and information necessary for the establishment of a framework for identifying the impacts of climate change, estimating the costs and developing avenues for the integration of adaptation into national development planning in DRC (unpublished report, MECNT 2013). This process benefited from the participation of multisectoral experts from nine departments of the administration. These experts have the responsibility to promote the debates in order to define and use the concept of 'economy of adaptation' in the DRC; to facilitate research on climate change as well as studies and evaluations of the vulnerability of some sectors; to identify weaknesses and institutional, human, legal and financial gaps; to evaluate the needs and capacities that need to be strengthened in order to facilitate the process of formulating the national plan of adaptation; to identify the opportunities and avenues of cooperation; and finally to develop a general report of the study (unpublished report, MECNT 2013). This project is supported by UNDP, which in fact provides support for adaptation policy in the country.

2 Report study document for the establishment of a national climate plan in DRC, prepared by the Ministry of the Environment, Conservation of Nature and Tourism (MECNT) in 2013 in Kinshasa.

These projects are real opportunities to harmonize the vision of DRC in its strategy for combating climate change, as the projects incorporate both mitigation and adaptation. In this regard, they constitute models of multisectoral initiatives aimed at fighting climate change. A good knowledge of the challenges of the two processes would give the opportunity to consider the institutional schemes, which would avoid inefficient duplication and provide wherever possible the opportunity to effectively and efficiently implement both adaptation and mitigation.

7.1.2 Adaptation and national REDD+ strategies: Opportunities in the fields of agriculture and agroforestry

Contrary to REDD+, which already has a strategy document, the adaptation document refers only to the national program on adaptation, which was still under construction at the time of this study. The national strategy of DRC for REDD+ is built around the following: improvement of legal and institutional frameworks; implementation of various measures aimed at the identification and securing of land rights; capacity building; and the promotion of service companies (MECNT 2012). Key strategic sectors are agriculture, energy, forestry, governance, demography, land use planning and land tenure (MECNT 2012). However, support is highly needed in order to make these sectors more resilient to climate change.

The current state of knowledge on climate change adaptation highlights the fact that agriculture is the top priority sector in the NAPA of DRC through its project NAPA-ASA and also defines the national REDD+ strategy. There are also opportunities for synergies between adaptation and mitigation.

7.2 Resilience of cyclical risks related to political structures

Over time, the political structures of DRC have taken on a configuration that is likely to make the country more resilient to conjunctural risks weighing on the formulation of policies about adaptation to climate change and REDD+. Thus, it is at the country level that governance structures for coordination efforts are affected, while downscaling international dynamics at the national level still poses a number of challenges.

7.2.1 Structure of political governance and coordination efforts: The stakes of power relationships relating to a multisectoral issue

The DRC governmental crisis ended on 30 June 2003. This marked the establishment of successive governments with different configurations. The first was the transitional government that brought together three main political parties following an agreement among these parties. This first government was marked by six ministerial reshuffles on 11 July 2004, 3 January 2005, 18 November 2005, 24 March 2006 and 10 October 2006. The second was put place in 2007 and, between 2007 and 2012, DRC experienced three governments and a total of six ministerial reshuffles. At the end of 2013, the debate was about the establishment of a national unity government. One of the common and constant characteristics for all these governments was the search for a balance between the different coalitions in the sharing of ministerial portfolios, which were distributed on the criterion of belonging to the political coalition and between various actors originally in the competition for the presidency of the Republic.

This model of governance and the speed of internal changes influence the decision-making process, especially when the question under discussion is of a multisectoral nature. This situation led to a limitation in the coordination efforts of governmental activities. In fact, since the end of the transitional government in 2006, some parties have been holders of the same ministerial portfolio during almost the whole succession of governments (see Annex 2). This is the case for the Ministry of the Environment which, since 2007, is still headed by a member of the Christian Democratic Party (PDC); for the Ministry of Planning by a member of the Alliance for the New Congo (ARC); and for the Ministry of the Economy by a member of the Party of the Alliance for National Unity (PANU). At the same time, other sectors have experienced a lesser sedentarization of responsibilities, and portfolios have continued to go from one party to another.

All the ministers appointed in the various departments are leaders and/or influential members of political parties. An analysis of the portfolios whose activities have links with deforestation highlights this dynamic (see Annex 2). However, this structure of political governance has implications for the coordination efforts. Because of this, the issues of power relations may serve as barriers to the decisions and actions needed to deal with the issues of mitigation and adaptation to climate change, which are multisectoral.

7.2.2 International structure and national policies: The influence of the actors and the international context on the national climate policy

DRC is a signatory to important international conventions on climate change and is not unaffected by the influence of the international climate regime on national climate policy. This influence pervades the institutions, and affects multilateral treaties, rules and international discourses about and instruments of markets, financing, technical assistance and capacity building (Eba'a Atyi et al. 2011). As regards the hierarchy of norms, ratified conventions and international treaties take over the national laws, which should comply with them. The ratified conventions are generally the materialization of political discourses, which in fact reflect the will of the rulers. In fact, the process of adaptation and mitigation to climate change in DRC are largely funded by international organizations, including the World Bank and UNDP. The national funds expressly allocated to climate change are very small to nonexistent in a context where the issues of security and national integrity constitute the priority of the government. Capacity building of local actors is supported mainly by international donors. The dependence on market instruments leads to a scenario, not yet definitively agreed upon, whereby the international market for carbon could be adopted, which would solve both the question of price and of the conditions of production and marketing of certificates of avoided emissions. In response to this influence, one of the possible options is the ownership of the process by the national actors (di Gregorio et al. 2012). Yet, when the adequacy of the discourse and that relating to the control of the main emission sources is considered, it appears that the influence of international policies on the effectiveness of the climate policy of the DRC remains limited. In fact, a set of reforms aimed at the integration of climate policy in the development policies has been initiated. Yet, the coherence of these dynamics is the weak point of this effort. This gap is one of the crucial obstacles to the formation of synergies between the climate and development policies.

8 Conclusion

The issues involving the synergies between adaptation policies and REDD+ in the DRC have led to debates on multisectoral and multilevel governance for developing countries. In DRC, the political process around adaptation to climate change is still in development. The current efforts have not yet found their place in the political agenda at the intersectoral level and have been appropriated only at the national level by the Ministry of the Environment (MECNT). Initiatives on climate change at the local level cannot help build consensus around specific options for responses to climate change in a perspective of adaptation and mitigation. Multiple socioeconomic and political factors pose structural constraints for the integration and policy coherence needed for development and climate. However, these policies have the potential to help ensure multisectoral governmental success at national, provincial and local levels. As such, there is a need to reconsider the current approach of integration. In fact, the approach to integration should be flexible and participative and should capitalize on successful adaptation and mitigation options and give opportunities to both policy options to synergize with other development policies.

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Annexes

Annex 1. List of partners and stakeholders in the NAPAs

(Source: Annex NAPA (2006))

1. Chair of the Democratic Republic of Congo
2. Department of the Environment, of the Conservation of Nature, Water and Forests
3. Ministry of Planning
4. Department of Energy
5. Ministry of Agriculture and Livestock
6. Ministry of Rural Development
7. Department of Scientific and Technological Research
8. Department of the Interior
9. Ministry of Social Affairs
10. Department of Public Works and Habitat
11. Ministry of Transport and Communications
12. Department of International Cooperation
13. Ministry of Regional Cooperation
14. Ministry of Information and Press
15. Department of Justice and Keeper of the Seals
16. UNDP
17. FAO
18. NGOS
19. Universities
20. INERA
21. CRGM
22. SENASEM
23. SNEL
24. SNVA
25. RTNC
26. RTGA CHANNEL
27. Potential
28. Prosperity
29. Basic Communities
30. Association of Farmers
31. Associations of Farmers
32. Association of Forest Operators
33. FEC
34. METTELSAT
35. RVF
36. RVA
37. RVM
38. SENAFIC
39. FOLECO
40. CNONG
41. OVD
42. REFADD
43. GOLD
44. CNE
45. OCC
46. SSAC
47. ONATRA
48. National Assembly
49. Senate
50. BOOMs
51. Governorates
52. Provincial Divisions of the ministries concerned
53. CNCC
54. National Coordinators of meas.

Annex 2. Distribution of ministerial portfolios among the political parties in the DRC between 2003 and 2011

Transitional Government (30 June 2003 to 30 June 2006)

Department	Holder of the portfolio	Party	Position in the party at appointment
Environment and Conservation The Nature	– Anselme Enerunga	Mai-Mai	
Agriculture, Fisheries and Livestock	– Justin Kangundu		
	– Constant Ndom Ndaombel		
	– Paul Musafiri	MLC	
Planning	– Alexis Thambwe Mwamba		
	– Sessanga Hipung Adi Narathiwat	Province arrested Yapha Kaseng	
Economy	– Célestin Mvunabali		
	– Emile Ngoy Kasongo		
	– Floribert Bokanga		
	– Pierre Manoka	RCD	
Rural Development	– Pardonne Kaliba Mulanga	Mai-Mai	
Energy	– Kalema Lusona		
	– Pierre Muzumba Mwana	PPRD	

Government Gizenga I and II (5 February 2007 to 10 October 2008)

Department	Holder of the portfolio	Party	Position in the party at appointment
Environment	– Didace Pembe Bokiaga	PDC	Secretary General
Agriculture	– François-Joseph Mobutu Nzanga Ngbangawe	UDEMO	President
Planning	– Olivier Kamitatu Etsu	ARC/Forces Renewal	President
National Economy	– Sylvain Joel Bifuila Tshamuala	PANU	President
Rural Development	– Charles Mwando Nsimba	UNADEF	President
Energy	– Salomon Banamuhere Baliene	PPRD	
Land Affairs	– Liliane Mpande Mwaba	CODECO	Member of The Coalition

Government Muzito I (26 October 2008 to 19 February 2010)

Department	Holder of the portfolio	Party	Position in the party at appointment
Environment and Tourism	– Jose Endundo Bononge	PDC	President
Agriculture	– Norbert Basengezi Katintima		
Planning	– Olivier Kamitatu Etsu	ARC	President
Economics and Commerce	– Andre Philippe Futa Mudiumbula	PANU	Second chair-National and Coordinator AMP
Rural Development	– Kpaki Adiri		
Energy	– Laurent Muzangisa		
Land Affairs	– Maj Kisimba Ngoy	UNAFEC	

Government Muzito IIa and IIb (19 February 2010 to 11 September 2011)

Department	Holder of the portfolio	Party	Position in the party at appointment
Environment, Conservation of Nature and Tourism	– José Endundo Bononge	PDC	President
Agriculture	– Norbert Basengezi Katintima		
Planning	– Olivier Kamitatu Etsu	ARC	President
National Economy	– Jean-Marie Bulambo Kilosho	ANU	
Rural Development	– Philippe Undji Yangya		
Energy	– Gilbert Tshiongo Tshibinkubula Wa Tumba		
Land Affairs	– Maj Kisimba Ngoy	UNAFEC	

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The countries in the Congo Basin are poor and vulnerable and, as such, suffer from the negative effects of climate change. Fighting this phenomenon has become an item on countries' policy agendas. Processes, based on mitigation and adaptation measures, have been launched at various levels and places in these countries to cope with the dynamics of a changing climate. But to study and implement mitigation and adaptation measures simultaneously is not enough. In a situation characterized by poverty and resource shortages – especially financial resources – and to support a process that is already exceptionally slow, it is important to go further and consider the synergy between mitigation and adaptation. The principle described in this analysis is combined with thoughts on the best way to proceed, a way to encourage more thorough analyses and ensure *ex situ* integration and coherence between climate and development policies, and *in situ* integration and coherence within the climate policies, the objective being to deliver both ecological and policy synergy outcomes.

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