A PLATFORM FOR STAKEHOLDERS IN AFRICAN FORESTRY

IMPLEMENTATION OF REDD+, CDM AND AFOLU NDC IN FRANCOPHONE AFRICA

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Implementation of REDD+, CDM AND AFOLU NDC in Francophone Africa

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Acronyms and Abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
CAR	Central African Republic
CB	Congo Basin
CDC	Cameroon Development Corporation
CDM	Clean Development Mechanism
CEMAC	Central Africa Economic and Monetary Community
CERs	Certified Emission Reductions
CGIAR	Consultative Group for International Agricultural Research
CIFOR	Centre for International Forestry Research
COMIFAC	Central Africa Forest Commission (French)
DRC	Democratic Republic of Congo
ERP	Emission Reduction Programme
ER-PIN	Emission Reduction - Programme Idea Note
ESTs	Environmentally Sound Technologies
ET	Emission Trading
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Programme
FPIC	Free Prior and Informed Consent
FRA	Forest Resource Assessment
GDP	Gross Domestic Product
ICAO	International Civil Aviation Organization
ICRAF	World Agroforestry Centre
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contributions
JI	Joint Implementation
NCBs	Non-Carbon Benefits
NGOs	Non-Governmental Organizations
NTFPs	Non-Timber Forest Products
REDD+	Reducing Emissions from Deforestation, Forest Degradation and the role of Conservation, Sustainable Forest Management and Enhancement of Forest Carbon Stocks
RoC	Republic of Congo
R-PIN	Readiness Plan Idea Note
RPP	Readiness Preparation Proposal
RSPO	Round Sustainable Palm Oil
SIAT	Société d'investissement pour l'agriculture Tropicale
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Programme for Reducing Emissions from Deforestation and Forest Degradation
USD	United States Dollar

Executive Summary

The role of forestry in sequestering carbon dioxide from the atmosphere is gaining traction at the global level as a cost-effective solution to mitigating climate change. Through forest-based mitigation initiatives such as the Clean Development Mechanism (CDM); Reducing Emissions from Deforestation and forest Degradation (REDD+); Agriculture, Forestry and Other Land Uses (AFOLU) and more recently the Nationally Determined Contributions (NDC), many African countries are actively engaged in fighting climate change while promoting sustainable development.

This study therefore examines the state of implementation of REDD+, CDM, AFOLU NDC and voluntary Carbon market-oriented activities in Africa. It uses primary and secondary data sources to document progress made and challenges faced, and highlights potential opportunities for improvement moving forward. Particular focus is laid on four selected Francophone African countries: Burkina Faso, Cameroon, Cote D'Ivoire and the Democratic Republic of Congo. Our analysis show that the four study countries are more engaged in REDD+ than in forest-based CDM, while NDC is increasingly becoming the predominant focal policy document that represents countries' commitments to fighting climate change both on the adaptation and mitigation fronts. REDD+, CDM, AFOLU are in one way or the other embedded within the NDC of African countries.

REDD+ in most African countries in general and the study countries in particular is funded mainly through the World Bank's FCPF, FIP and UN-REDD initiatives with additional funds from bilateral sources. Burkina Faso, Cameroon and Cote D'Ivoire have made very good progress in the readiness phase of REDD+ and are gradually transiting to the investment phase. DRC on the other hand started transiting into the investment phase since 2014 following the validation of the country's ER-PIN of Mai-Ndombe. DRC largely remains in many ways a leader of REDD+ process in Africa and is now negotiating an Emission Reduction Payment Agreement (ERPA) with the World Bank. In most of these countries, including DRC, determinants for the successful and sustained uptake of REDD+ linger around capacity building, finance, transfer of technology, safeguards, price of carbon, carbon and non-carbon benefits, governance and institutional arrangements among others.

Forest-based CDM has not enjoyed a lot of success in Africa despite the many economic, social and environmental benefits CDM afforestation and reforestation activities offer. The current unsuccessful situation in Africa can be explained by factors such as weak capacities (institutional, governance and technical), complex land tenure systems, financial constraints, low socio-political potential, less attractive business climate for investors, limited market access for Certified Emission Reductions credits and unstable market prices for CER credits.

Adoption of the idea of NDCs was one of the bases for the Paris Climate Agreement. Many African countries, however, use their national development vision to guide their climate change contributions. In the ongoing process, AFOLU remains a crucial part of NDC adaptation and mitigation contributions of African countries, aimed at achieving long-term low carbon and climate resilient development.

CHAPTER 1 INTRODUCTION

1.1 TRENDS AND EVOLUTION OF FOREST MITIGATION MECHANISMS IN AFRICA

Recent efforts to mitigate climate change have led to the increasing importance of the role of forestry and other land uses in sequestering carbon dioxide from the atmosphere. The prospects of using forestry projects in the mitigation of global climate change have, therefore, received considerable attention (Unruh, 2008). For Africa, the sequestration of carbon dioxide by the forest does not only serve the purpose of mitigating global warming but as well represents a window of opportunity for the funding of sustainable development initiatives through financial inflows (Jindal et al., 2008). The Kyoto protocol introduced three market mechanisms: clean development mechanism (CDM), joint implementation (JI) and emission trading (ET). CDM and JI represent two project-based mechanisms that feed the carbon market. While CDM involves implementation of emission reduction or removal projects in developing countries by industrialized countries, JI enables developed countries to implement emission reduction or removal projects in other developed countries (UNFCCC, 2014).

Following the emergence of the Kyoto Protocol, forest mitigation mechanisms in Africa were mostly centred on afforestation and reforestation. Jindal et al. (2008) identified 23 carbon sequestration projects in Africa, with East Africa receiving most of the carbon investments. The project activities included rangeland conservation, farm forestry, rehabilitation of dense forests, conservation of biodiversity corridors, restoration of the Lake Victoria Basin and rehabilitation of riparian vegetation. Of the 23 identified carbon sequestration projects, only two projects in Madagascar and Uganda were Kyoto-compliant while eight were potentially Kyoto-compliant. The World Bank emerged as the biggest Carbon investor in Africa, funding 12 of the 23 projects.

With the emergence of REDD+ as a mechanism geared at mitigating climate change in tropical forest countries through the reduction of forest related emissions, there has been the proliferation of REDD+ initiatives in Africa. Forest mitigation mechanisms in Africa are not only limited to afforestation and reforestation activities, but as well includes sustainable forest management, conservation and the reduction of emissions from deforestation and forest degradation. Of the 47 REDD+ participating developing countries, 18 are African States that have signed an agreement to participate in the REDD+ readiness fund (FCPF, 2015e). Seven (Cameroon, Cote d'Ivoire, Ghana, DRC, Republic of Congo, Madagascar and Mozambique) of the 18 participating REDD+ African countries have made significant progress in the REDD+ readiness phase and with their emission reduction programme idea

notes selected in the FCPF pipeline (FCPF, 2015f). DRC appears as one of the leading countries in Africa in terms of implementation of the REDD+ mitigation mechanism with its emission reduction programme document approved by the participants committee of the FCPF in June 2016 (Lang, 2016).

1.2 OBJECTIVES AND SCOPE OF THE STUDY

The focus of this study is on the implementation of REDD+, CDM, AFOLU NDC and voluntary carbon market-oriented activities in selected Francophone African Countries. The objectives of the study were to:

- Analyse and document progress made on implementation of REDD+ based activities and other related AFOLU NDC initiatives;
- Assess conditions and determinants of uptake of REDD+ approaches and AFOLU NDC initiatives;
- Evaluate challenges on development and implementation of REDD+;
- Examine how to make REDD+ sustainable in Africa;
- Analyse and document progress made on implementation of forest based CDM activities, voluntary carbon markets and other related AFOLU NDC initiatives;
- Evaluate challenges on development and implementation of forest based CDM projects as well as introduction of voluntary / compliant carbon markets;
- Examine the impact of benefit sharing mechanisms on REDD+ and CDM projects;
- Evaluate and analyze the impact of legal, policies and institutional measures on implementation of REDD+ and forest based CDM activities as well as voluntary/compliant carbon markets and trade including benefit sharing mechanisms.

This study was carried out in five Francophone countries: Burkina Faso, Cameroon, Cote d'Ivoire, Madagascar and DRC. This was to complement a similar study carried out by another expert in five (5) Anglophone countries namely, Zambia, Zimbabwe, Tanzania, Ethiopia, and Nigeria. The five countries in this study are characterized by different forest types all rich in biodiversity. Burkina Faso is dominated by dry forest while Cote d'Ivoire has rain forest, as well as deciduous and secondary forests. Cameroon and DRC are dominated by dense tropical rain forests of the Congo basin. DRC is, however, also covered with Miombo forest in the south while Cameroon is also endowed with coastal and dry forests in the West and northern parts. Forest types in Madagascar are humid dense, humid dry, deciduous and mangrove forests.

The five countries for this study are actively engaged in either or both of the UN-REDD and World Bank's Forest Carbon Partnership Facility (FCPF) initiatives, aimed at supporting countries in their national REDD+ process. All the five countries are either in, or almost entering, the investment phase. DRC is the pioneer and is the most advanced in many aspects of REDD+ in Africa. DRC is in the investment phase (2) of REDD+ since 2013 and is currently developing an emission reduction program (ER-P) in the Mai Ndome province, covering about 12.3 million ha of forest land. Recently, in September 2015, Madagascar and Cote d'Ivoire had their ER Program Idea Notes (ER-PIN) validated by the FCPF participants' committee, paving the way for their evolution from the readiness to the investment phase of REDD+. For Cameroon, the FCPF REDD+ actors validated their ER-PIN in early 2016, while Burkina already has funds from the Forest Investment Program (FIP) to develop activities for REDD+ phase 2. Interestingly, all the countries except Madagascar are involved in the FIP process even though some (Burkina and DRC) are advanced in implementing while others (Cameroon and Cote D'Ivoire) are early in the process.

In the rest of this report, we first present the methodological approach for data collection and analysis. We then present the results and discussions related to REDD+ in Section 1, CDM in Section 2, and AFOLU and NDCs in Section 3. Concluding remarks, recommendations and references are presented in each of the sections.

1.3 STUDY METHODOLOGY AND DATA TOOL

The method of data collection and analysis was dictated by the expected thematic outputs. For the results related to REDD+ and CDM, primary and secondary sources were used for data collection. First, national policy documents and reports submitted to the multilateral REDD+ development initiatives were reviewed and analysed. REDD+ and CDM design and implementation in the five study countries were reviewed against the background of the practice in Africa in general. The different data collection sources used are shown in Table 1. Secondly, to deepen the analysis, field visits were made to Cameroon, DRC, Ivory Coast and Burkina Faso to collect more data on REDD+. Field visit was not made to Madagascar. Secondary data for Madagascar was employed for the analysis.

During the field visits to the four countries, key resource persons working in the REDD+ process, both at the national and international levels, were interviewed face to face, using a set of broad guiding research questions to gather their perceptions and views. The questions included the following:

- What processes are required to attain full REDD+ cycle in different forest types in your country?

- What has been hindering your country from attaining the full cycle of the REDD+ process?
- What should be done to facilitate completion of the REDD+ and CDM processes?
- What are the conditions and determinants for the uptake of REDD+?
- What are the challenges inhibiting CDM and REDD+ implementation in your country?
- What are the opportunities and strengths that enhance the implementation of REDD+ and CDM in your country?
- What are the expected conditions for a successful implementation of REDD+ and CDM activities?

Table 1: Data matrix listing the information needs plotted against data source

Information Needs	Data Source
- Case studies on REDD+, CDM etc	- Science Direct and Springer publications - Web of Science database - Open access journals - UNFCCC web site (NDC, NC, etc) - World Bank website (FCPF CF etc.) - CGIAR website (CIFOR, ICRAF etc.) - Climate change and forest mailing lists - Google scholar (grey literature) - Project documents and reports
- AFOLU NDC	
- Forest carbon market	
- REDD+ phases 1 activities	
- REDD+ phase 2 activities in Africa	
- Lessons learned from pilot actions	
- REDD+, CDM	
- Emission reduction programs	

CHAPTER 2: REDD+

In this section we present the state of REDD+ development and implementation in Africa, highlighting challenges and opportunities. The section presents the readiness process in the study countries, highlighting progress, coordination and determinants of progress. The investment phase is described highlighting, among other factors, safeguards and participation, non-carbon benefits, legal and institutional arrangements, and benefit sharing.

2.1. REDD+ PROCESSES IN DIFFERENT AFRICAN FOREST TYPES

2.1.1. Readiness phase

Reducing emissions from deforestation and forest degradation, conservation and enhancement of forest carbon stocks, and sustainable management of forests (REDD+) is emerging as a central instrument to curb land use related emissions in developing countries (Corbera & Schroeder, 2011). REDD+ is a climate change mitigation mechanism which provides incentives for reducing greenhouse gas emission by commodifying the carbon stored in forests. The REDD+ mechanism is comprised of three phases: readiness, investment and results (Lotsch, 2011). The readiness phase entails the development of national strategies while the investment phase is characterized by results-based demonstration activities. The results phase is concerned with results-based actions, which generate emission reductions, which are fully measured, reported and verified. As part of the readiness phase, countries are required to produce a readiness plan idea note (R-PIN) for REDD+, after which a readiness preparation proposal is developed (R-PP). Upon approval of the R-PP by the Participants Committee (PC) of the Forest Carbon Partnership Facility (FCPF), the country in question signs a grant agreement (See Table 2) after which it receives a readiness grant of up to US$ 3,600,000 from the FCPF.

The objective of the readiness grant is to enable the recipient country to strengthen her capacity in designing a socially and environmentally sound national strategy for the reduction of emissions from deforestation and forest degradation and the development of a national reference scenario of emissions emanating from deforestation and forest degradation that takes into consideration national circumstances. Countries have possibilities to further receive up to USD 200 000 from the FCPF to strengthen their national grievance and feedback mechanisms. This is a mechanism established to manage and resolve conflicts that would arise from the national REDD+ process and also constitutes a channel through which feedback pertaining to the REDD+ process/activities is received from the local to the national level.

Table 2: Timeline for Elements of REDD+ readiness in the study countries

Readiness Element	Cameroon	Burkina Faso	DRC	Cote d'Ivoire	Madagascar
Approval of R-PP	R-PP approved by PC in February 2013	R-PP approved by PC in December 2013	R-PP approved by PC in July 2010	R-PP approved by PC in May 2014	January 2013
Readiness grant agreement	Grant agreement signed in December 2013 (World Bank, 2013)	Grant agreement signed in January 2015 (World Bank, 2015a)	Grant agreement signed in March 2011 (World Bank, 2011)	Grant agreement signed in September 2014 (World Bank, 2014)	Grant agreement signed in May 2015 (World Bank, 2015b)

Activities of the REDD+ readiness phase for which the readiness grant is intended to finance include:

i). **REDD+ readiness process coordination:** this entails the provision of support to the structures aimed at leading the coordination and implementation of the REDD+ readiness process, by the recruitment of REDD+ technical experts to support the national REDD+ coordinator and strengthen the REDD+ technical secretariat, conducting nationwide meetings and workshops so as to ensure that REDD+ is integrated in sectorial and national policies and is in harmony with other planned development initiatives, and ensuring the functioning of REDD+ national and sub national structures.

REDD+ Readiness Coordination is also concerned with the strengthening of stakeholders' engagement in the REDD+ process, by conducting consultations with relevant stakeholders on key REDD+ activities, including, but not limited to, benefit sharing and drivers of deforestation and forest degradation and institutional capacity building of stakeholder at the sub national level in order to increase their engagement in the REDD+ process.

ii). **Establishment of a national reference scenario for REDD+:** This is related to the conducting of an analysis of factors that will put pressure on the forest in the national territory of the REDD+ country. It is achieved by analysis and modeling of the possible impacts on the forest, as a result of development activities that would be implemented in different sectors, including, but not limited to, agriculture, logging, energy and infrastructure (World Bank, 2011, 2013, 2014 & 2015).

iii). **Support to the design of the national REDD+ strategy**; this is concerned with the support of a program of activities geared at developing a national REDD+ strategy, the conducting of a strategic environmental and social assessment (SESA), and the support of the early implementation of the feedback and grievance redress mechanism and the support of the REDD+ implementation framework by analysing legal and institutional issues.

The state of REDD+ readiness in Cameroon, Burkina Faso, DRC, Cote d'Ivoire and Madagascar is presented in **Error! Reference source not found.**3. Of the five countries, DRC appears to be the most advanced. For instance, DRC is the only country with an established forest monitoring system as well as a social and environmental management framework approved by the World Bank. DRC's advancement could be explained by the fact that the country was the first of the five countries to have her R-PP approved by the Participants Committee in 2010 (**Error! Reference source not found.**) while that of Cote d'Ivoire was approved in 2014 and those of the two other countries approved in 2013. Consequently, DRC was able to get access to the REDD+ readiness fund in 2011 and could implement its REDD+ readiness activities sooner than the other countries. The state of the REDD+ readiness in the study countries is presented in Table 3.

Table 3: State of REDD+ Readiness Activities in Cameroon, Burkina Faso, DRC, Cote d'Ivoire and Madagascar

REDD+ Readiness Activity	Sub Activity	Progress Achieved in REDD+ Readiness Activities				
		Cameroon[a]	Burkina Faso[b]	DRC[c]	Cote D'Ivoire[d]	Madagascar[e]
REDD+ Readiness process coordination	Recruitment of REDD+ technical experts	- REDD+ technical secretariat operational since April 2014; -pilot committee created, -climate change and REDD platform in existence.	- National REDD+ platform, national REDD+ committee, Regional REDD+ committee and communal REDD+ committee, all in place.	-National committee, inter-ministerial committee and national REDD+ coordination and REDD+ pilot committee established.	-Independent REDD+ institutions, National commission committees, National and technical inter-ministerial committee and REDD+ Secretariat established	Institutional arrangements that will implement and coordinate REDD+, ensure engagement of stakeholders and monitor technical and methodological tools have been put in place i.e. the National REDD+ coordination Office
	Nationwide meetings and workshops	-REDD+ capacity building Workshops with indigenous and local people and councils organized	-Not much progress achieved	-Many REDD+ launching workshops organized.	-Six workshops geared at training, information and sensitization organized at the national and local levels.	Meetings have been held at the national, regional and local levels
	Consultation with relevant actors on REDD+ issues	-Capacity building of key actors organised e.g. CSO, communities, proponents	-Not much progress achieved	-Many consultations organized	-Elaboration of REDD+ communication plan and key actors consultation ongoing	Consultations held in 12 regions during the R-PP preparation, consultations currently going on involving priate sector, NGOs and local communities
	Legal and institutional reforms	- Forestry and land tenure laws are under revision -Elaboration of land use plan, creation of a competence centre of geometry and a cartography/ tele detection centre are ongoing	-Revision of forestry code, legislative and regulatory framework to integrate REDD+ are ongoing -REDD+ is integrated in the national policy for sustainable development.	-Launch of activities for key reforms in the territorial planning and land sector. -Draft revision of the decree relating to the steering committee of the REDD+ process.	-The elaboration of a national development plan 2016-2020 that includes REDD+ issues is ongoing. -The development of a zero-deforestation agriculture concept is ongoing.	- Institutional and legal reform need assessment is ongoing. - Legal and regulatory framework for REDD+ assessed and a roadmap to implement recommendations for improving the legal process proposed

REDD+ Readiness Activity	Sub Activity	Progress Achieved in REDD+ Readiness Activities				
		Cameroon[a]	Burkina Faso[b]	DRC[c]	Cote D'Ivoire[d]	Madagascar[e]
Establishment of a National REDD+ reference scenario	Identification of future drivers of deforestation and forest degradation	-Method for identifying drivers established. -Study on drivers ongoing.	-Studies for the identification of drivers of deforestation and forest degradation is ongoing.	-The elaboration of a national forest monitoring system is ongoing	-Capacity building of teams on the methodology to be used is ongoing. -A study on drivers ongoing.	Studies have been initiated to beef up existing information on drivers, to identify local patterns of deforestation in other to propose localised strategic options for each region
	National forest monitoring system and MRV.	-Conducted feasibility study of an MRV system and identify different land cover and parameters for defining forest for REDD+	-Establishment of national committee for forest surveillance.	-An established national forest monitoring system	-Capacity building of teams on method, reference level development and national forest inventory are ongoing -MRV unit operationalized since April 2016	The development of the national forest monitoring system is underway and is expected to be finalised by January 2015
Support to National REDD+ strategy design	Development of a REDD+ strategy	-Draft REDD+ strategy and analysis of strategic options.	-Limited progress achieved	-National REDD+ strategy elaborated.	-Formulation of the national REDD+ strategy is ongoing.	REDD+ national strategy is ongoing
	Safeguards	-Free, prior and informed consent (FPIC) guidelines elaborated. -Training of trainers on the use FPIC guidelines	-No progress achieved	-Capacity building and mobilisation of CSO on safeguards. -Work on FPIC and safeguards conducted	-Recruitment of a cabinet in charge for the elaboration of six social and environmental safeguard instruments is ongoing.	The development of the safeguards information system is ongoing
	Conducting SESA	-No progress achieved. Absence. Non-existence of an environmental and social management framework.	-No progress achieved	-Environmental and social management framework approved by the World Bank in January 2015.	-Absence of an environmental and social management framework.	SESA is ongoing with capacity building of actors responsible for implementation of SESA and SIS.
	Feedback and redress mechanism	- An assignment to study and propose a benefit sharing and conflict management mechanism has been launched	-No progress achieved	-Study on benefit sharing of REDD+ has been conducted. -Test of standards ongoing.	-A benefit sharing plan is envisaged in the national REDD+ strategy.	

Key: a: information for Cameroon obtained from FCPF, 2015a, b: information for Burkina Faso obtained from FCPF, 2015b, c: information for DRC obtained from FCPF, 2015c, d: information for Cote d'Ivoire obtained from FCPF 2015d and Republic of Cote d'Ivoire 2016, e: information for Madagascar obtained from FCPF, 2015h

2.1.2. Investment phase

The three phases of REDD+ are not purely sequential, but overlap to a great extent (UNFCCC, 2016). This implies that a country can transit into the investment phase of REDD+ while still implementing some REDD+ readiness activities. The Carbon Fund is the second fund of the FCPF and it provides payment for verified emission reductions emanating from REDD+ programs in countries that have demonstrated considerable progress towards REDD+ readiness. Carbon fund is meant to provide incentives to countries to enable them adopt the necessary systems and policies and undertake the needed investments. The carbon fund commitment should be made early enough, but the Participants Committee of the FCPF must assess the readiness package of the concerned country prior to the country entering an emission reduction payment agreement with the Carbon Fund (UNFCCC, 2016).

Cameroon and Cote d'Ivoire currently have their emission reduction program idea notes (ER-PINs) in the FCPF pipeline (FCPF, 2015e). Cote d'Ivoire signed the letter of intent in November 2015 while Cameroon signed the letter of intent in January 2017 (See **Error! Reference source not found.**). DRC had entered into the investment phase of REDD+ in 2014 following the validation of the country's ER-PIN for Mai-Ndombe by the Carbon Fund of the FCPF (Government of DRC, 2016). DRC's emission reduction program document (ERPD) was approved in the course of the 14th meeting of the Carbon Fund in June 2016 (Lang, 2016). The next stage for DRC entails the negotiation of the Emission Reduction Payment Agreement (ERPA) with the World Bank. Burkina Faso is still in the readiness phase of REDD+ and this could likely be due to their relatively late signing of the readiness grant agreement in January 2015. With the exception of DRC and Madagascar, the other three countries have not yet prepared an ERPD. Countries can only negotiate and sign an ERPA after their ERPD has been submitted to and selected by the FCPF carbon fund. Hence, the negotiation and signing of the ERPA for the other countries is not available or applicable as presented in Table 4.

Table 4: State of the Carbon Fund in Cameroon, Burkina Faso, DRC, Cote d'Ivoire and Madagascar (as of January 2018).

Carbon Fund stages	Cameroon	Burkina Faso	DRC	Cote d'Ivoire	Madagascar
ER-PIN selection	-Selected into the FCPF pipeline	- ER-PIN. Yet to be developed.	-Selected into the FCPF pipeline	-Selected into the FCPF pipeline	-Selected into the FCPF pipeline
Signing of letter of intent	-Signed	-Not signed yet	-Signed	-Signed	- Signed

Carbon Fund stages	Cameroon	Burkina Faso	DRC	Cote d'Ivoire	Madagascar
Draft ERPD prepared	-Not available	Not available	-Prepared	-Not available	-Prepared
Submission and selection of ERPD	-Not available	-Not available	-Validated in June 2016	-Not available	-Not available
ERPA negotiation and signing	-Not available or applicable	-Not available	-Next step	-Not available	Not available

Source: FCPF, 2017

2.2. CONDITIONS AND DETERMINANTS FOR UPTAKE OF REDD+ IN DIFFERENT FOREST TYPES

2.2.1. Capacity building

Capacity-building has been part of the UNFCCC negotiating process since its inception. The UNFCCC therefore guides (African) countries to improve their capacities in many areas of REDD+ in order to effectively design, elaborate and implement enabling and sectorial REDD+ actions at the national and local levels. So far, the governments of Burkina Faso, Cameroon, Cote d'Ivoire, DRC and Madagascar, among many others, are embarking on capacity building programs, projects, activities that ensure the transfer of REDD+ technical know-how from one level to another. DRC and Madagascar, for example, have many REDD+ projects and they involve international experts working side by side with national experts and, hence, the creation of a platform where national and local actors can build their capacities, for the process of elaborating DRC's national climate strategy, readiness preparation (R-PP) and the emission reduction program (ERP).

DRC's approach is widely used in many African countries where expatriates take the lead and national and local actors follow and have the opportunity to build their capacity. Cameroon, on the other hand, relies most of the time on the skills of national experts who then train other national and local REDD+ actors. While the Cameroon approach promotes local ownership and training by doing, it is often less popular with international experts and communities and may face some unnecessary resistance by international REDD+ initiatives such as the FCPF (Fobissie et al. 2014). This is evident in the elaboration of Cameroon's R-PP and Emission Reduction Program Idea Note (ER-PIN). In DRC, Cameroon, Burkina Faso, Cote d'Ivoire and Madagascar, just like in many other African countries, capacity building takes different formats and approaches. It sometimes occur in the form of a full-fledged capacity building project, an objective within a climate change project or program,

just one off training or series of sensitization workshops of different actors (the state, logging and mining companies, forest-dependent communities, etc.). The thematic areas for Africa to catch up on capacity building spans from basic conceptual and theoretical aspects to complex issues linked to additionality, reference levels/ reference emission levels (RL/REL), measurement, reporting and verification (MRV), policy, safeguards, land use planning, governance to sectorial interventions in agriculture, forestry, energy, etc. (Mbow et al. 2012, Romijn et al. 2012, Fobissie et al. 2014). At the end, capacity building can directly influence policies (Aquino and Guay 2013, Somorin et al., 2014, Fobissie 2015) and the overall success of the REDD+ process in reducing forest carbon emissions.

2.2.2 Transfer of technology

Environmentally Sound Technologies (ESTs) are central to mitigating climate change and to increase resilience to climate change impacts. So far, the focus of the technology debate has been dominated by technologies for mitigation and more recently by the need to meet financial requirements for technology transfer. At the sectorial level, technology transfer activities have been limited mainly to the forest and energy sectors. In the forest sector, the activities include entrepreneurial and management skills, and the utilization of sawmill steam engine powered generator, while for the energy sector they cover technology transfer activities related to equipment maintenance skills, and renewable energy technologies. Main obstacles to technology transfer from developed to developing countries like Burkina Faso, Cameroon, Cote d'Ivoire, DRC, Madagascar and Africa at large are linked to economic and market barriers, intellectual property rights, lack of information and awareness regarding ESTs, lack of institutional, regulatory and human capacity to tackle the technology transfer process successfully, and the translation of the technology needs assessments (TNAs) into viable projects. Currently, the speed of transfer of technology required by REDD+ countries to develop robust MRV systems is slow. Yet the MRV system is very relevant for countries to demonstrate performance in keeping forests standing.

2.2.3 Finance

Africa has received the least amount of REDD+ finance compared to Latin America and the Caribbean and South-East Asia. Some developed countries have rather resorted to providing REDD+ support from their development aid budgets, implying that their climate financing is not new or additional to development aid as recommended by the UNFCCC. Burkina Faso, Cameroon, Cote d'Ivoire and DRC are engaged in readiness activities (phase I) and now transiting into the investment phase (phase II). Figure I shows that sub-Saharan African countries have received and continue to receive financial support mainly from the World Bank's Forest Carbon Partnership Facility (FCPF), Forest Investment Programme (FIP), UN-REDD programme and bilateral funding, especially from Norway, Germany, and the UK. This has led to the production of Readiness Project Idea Note (R-PIN), Readiness Preparedness Plan (R-PP) and Emissions Reduction Program Idea Note (ER-PIN) in all the

countries, except Burkina Faso that is still to elaborate its ER-PIN successfully. The slow progress of REDD+ in Africa can be explained by many factors, amongst which must be included: the need to create the enabling environment for investing in REDD+, such as the establishment of a National REDD+ Fund; the unkept pledges from developed countries to fund REDD+; corruption and mismanagement of disbursed REDD+ funds (Mpoyi et al 2015); and less efficient and less costly disbursal, balancing long-term goals with immediate needs for money to support on-the-ground actions (Nakhooda et al. 2015). In Madagascar, the funds to support REDD+ actions have been qualified as inadequate and the financial management process also described as weak, leading to inter-ministerial conflicts (FCPF, 2015h).

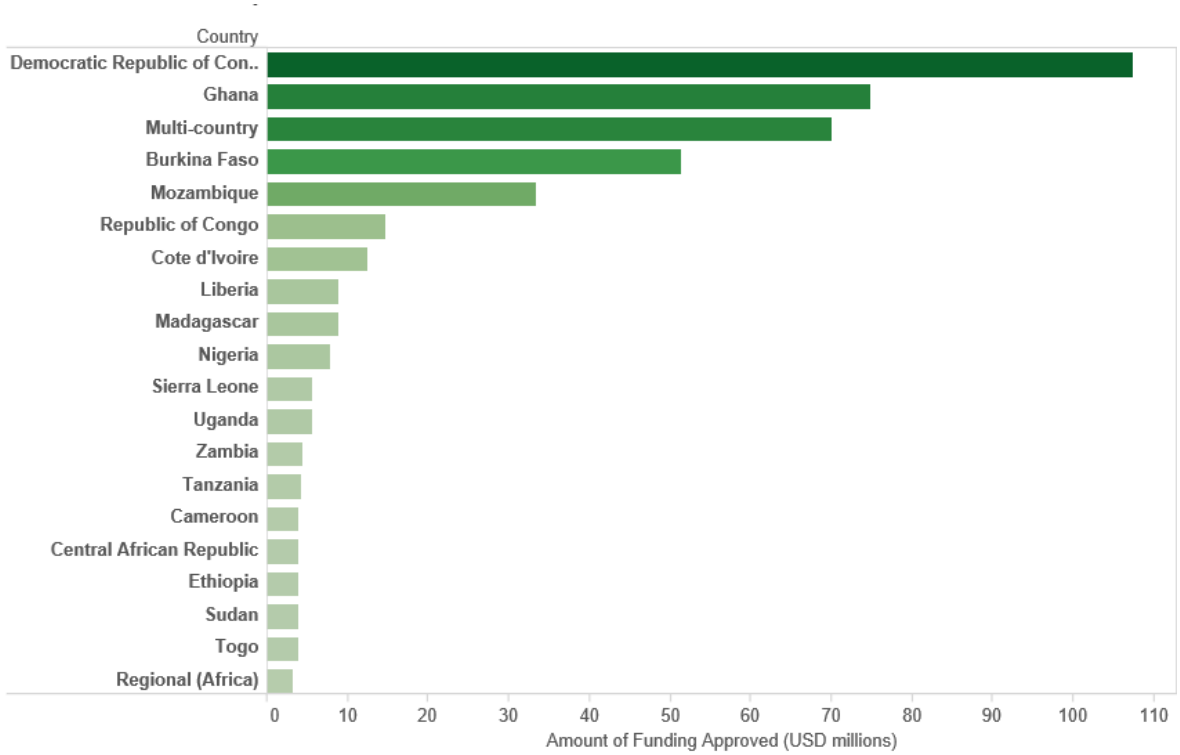


Figure 1: REDD+ funds received by sub-Saharan African countries from multilateral sources

Source: Climate Funds Update: http://www.climatefundsupdate.org/data (accessed 1 February 2018)

2.2.4 Safeguards and participation

The UNFCCC adopted a set of safeguards in 2010 encompassing seven broad principles known as the Cancun Safeguards. The Cancun Safeguards include social and environmentally focused rules that seek to reduce the risks and potentially adverse impacts of REDD+ such as stakeholder exclusion from decision-making, women's and indigenous

peoples' participation in climate change and REDD+ policy forums and processes as well as in decentralized forest management. Many scholars have identified some of the hurdles to effective public participation process in REDD+ and forest management, as being linked to inequitable distribution of forest revenues, lack of access to benefits due to unclear land tenure arrangements, inadequate education and awareness, low level of gender consideration, lack of competent administrative personnel, insufficient infrastructural resources, insufficient time and financial resources (Bandiaky and Tiani 2010, Brown 2011, Freudenthal et al. 2011, Dkamela et al. 2011, Alemagi et al. 2013). Moving forward, these hurdles must be addressed effectively. In Madagascar, it is reported that there is poor knowledge about REDD+ safeguards, thus there is a need to build capacities, sensitize and communicate to local communities especially women and the youth (FCPF, 2015h).

2.2.5. Non-carbon benefits (NCBs)

NCBs are parts of the result of REDD+ activities and the associated costs. Focusing on incentivizing carbon alone would not make REDD+ viable or sustainable in Africa in the long-term. A much more holistic approach that ensures that NCBs from preserving or sustainably managing forests should be taken into account and supported in order to secure the buy-in and support of local communities and other stakeholders. A REDD+ initiative that seeks to generate NCBs may lead to greater carbon benefits through biodiversity conservation, watershed protection, rehabilitation of degraded and drought / flood prone lands, alternatives and improved livelihood opportunities, improved forest governance and tenure, and others. (Katerere and Fobissie 2015). The importance of NCBs is increasingly being recognized and integrated into the ER-PIN of Cameroon, Madagascar, Cote D'Ivoire and DRC (Box 1) meanwhile Burkina Faso is yet to elaborate an ER-PIN. Critical issues on NCBs are linked to ways to incentivize NCBs in phases one and two of REDD+ as well as identifying different funding sources to generate NCBs during the implementation of REDD+ (Katerere and Fobissie 2015). Further clarifications, demonstrations with indicators and baseline information are needed to support the valorization of NCBs.

Box 1: REDD+ NCBs categories in DRC ERP (source: GoDRC 2016)

Biodiversity: is maintained and ecosystems services are improved

Rights: The legal and customary and users' rights of local communities and Indigenous Pygmy Peoples over land, territories and resources are recognized, respected and strengthened

Livelihoods: REDD+ benefits are shared equitably; improved local livelihoods in the long-term and the well-being of stakeholders, with a particular focus on the most vulnerable groups

Finance and governance: Immediate, sufficient and predictable resources are mobilized in order to reward performance in the priority forest areas in an equitable, transparent, participatory and coordinated manner

2.2.6. Knowledge base

REDD+ actors, including those from Burkina Faso, Madagascar, Cameroon, Cote D'Ivoire and DRC, are expected to have some essential knowledge and skills to engage in the development and implementation of major aspects of REDD+. Barquín et al. (2014) identify five aspects of the essential knowledge and skills: a general competency for designing and implementing REDD+ activities; knowledge on key themes, key terms and definitions related to the theme as well as overview of conceptual elements; skills that are important in designing elements of the themes; important things to remember, and resources and tools related to key technical and policy documents, and training manuals that provide detailed information about the themes.

2.2.7 Benefit sharing mechanisms of REDD+

Benefit sharing mechanisms so far are drawing partly on past relevant experiences. Cameroon's R-PIN establishes that one way by which benefits obtained from REDD+ could be shared with local communities is via the Annual Forest Fees. According to the prevailing regulations 10% of these fund is channeled to the communities where the forestry operation is found, while the remaining 90% goes to state institutions: the State treasury (50%), municipality of the forestry operation (20%), and FEICOM - a State institution providing support to municipalities (20%). Many argue that the AFF benefit sharing framework which has been in place for over a decade, has not provided any socio-economic development within local forest-dependent-communities in Cameroon (Oyono et al. 2005; Cerutti et al. 2010). In the DRC, Mpoyi et al. (2013) noted that in a decentralized system like the one prevailing in the DRC the distribution of benefits and payments of revenue from natural resource exploitation has resulted in serious tension between the central and provincial government. Aquino and Rakotorianina (2013) reports that to attract early investment in REDD+, stakeholders like the UNDP, the State, and civil society have discussed the creation and effective functioning of a Multi-Partner Trust Fund (MPTF).

"The DRC National REDD+ Fund Steering Committee has the function of piloting the National REDD+ investment frameworks and the National REDD+ Fund. It will be a decision-making body chaired by the Ministry of Finance in close collaboration with the Ministry of Environment and composed of the various REDD+ related sectoral ministries. Furthermore, the committee will include representatives from civil society and Indigenous Pygmy Peoples, private sector and technical and financial partners (GoDRC 2016 p 90)".

The measuring, monitoring and reporting (MMR) system quantifies deforestation and degradation in a spatially explicit manner, thereby facilitating the just sharing of financial benefits, based on performance. Benefit sharing is therefore based on performance in reducing emissions. The current proposed benefit sharing plan of DRC emissions reduction purchasing agreement (ERPA) under the FCPF shows that 6% will go to programme monitoring and transaction cost, 27% will go to the execution of carbon-related contracts

with nested project, 56% will be reinvested into the programme while 10% will go to indigenous peoples and the province (GoDRC 2016). It is however important to note that the benefit-sharing plan is proposed for information only for the purposes of illustrating the practical application of the principles and to lay a basis for discussion with all partners in the run-up to signature of the ERPA and the implementation of the final revenue sharing plan. The principles of benefit sharing have 3 categories: General principles (Box 2); Principles for the distribution of Emission Reduction Credits; and Principles in the sales of Emission Reduction Credit.

Box 2: DRC general benefit sharing principles (Source: GoDRC 2016 page 210)

The principles of benefit sharing was agreed by all stakeholders during the design of the ER-PIN. These principles include the following:

1. Benefit sharing is based on the principle of equity and seeks to fairly distribute costs and benefits of the ER Program between stakeholders that effectively contribute to the implementation of activities.

2. Benefit sharing' is focused on the distribution of revenues from the valuation of emission reductions generated by ER Program activities.

3. Benefits will be shared in monetary and non-monetary form.

4. The transparency of benefit-sharing contracts and the principle of free, prior and informed consent will apply to agreements between the government and all other stakeholders involved.

5. Generate a capacity for reinvestment.

On the other hand, Cote D'Ivoire has finalized a feasibility study on a national framework on payments for environmental services which will serve as basis for benefits-sharing mechanism while Cameroon and Burkina Faso are still in the process of conducting a feasibility study on benefit sharing mechanism that will inform decision and engagement on benefit sharing amongst others. The ERPD of Madagascar (Section) contains information on the description of the benefit sharing arrangement as well as the process employed in the designing of the benefit sharing arrangement (Government of Madagascar, 2017).

2.2.8. Legal, policy, institutional and governance arrangements

In many African countries, REDD+ is embedded within existing institutions and in many cases does not really fit quite well and hence necessitate some modification, revision or formulation of new sets of legislations, policies, institutional and governance arrangements. The institutional management structure of the REDD+ process in many African countries consists of a National REDD+ Committee and a Technical Working Group or Task force.

Most of these committees, task forces or technical working groups are made up of representatives from the different ministries (forest, agriculture, land use, environment, economy, etc.) as well as actors from the civil society, private sector, local communities etc. The smooth functioning and coordination of such multi-actor governance platforms remain a key challenge (Tegegne et al. 2015). This challenge can be explained among others by the failure to integrate REDD+ in different sectorial and development policies (Korhonen-Kurki et al. 2014) and the "backseat" role given to the ministry of forestry and/or environment (Somorin et al. 2014). Other challenges include dual customary and modern legal systems of land management leading to contested land and forest tenure as well as carbon rights. In Madagascar, the REDD+ process is experiencing challenges in its institutional and governance arrangements, with skirmishes recorded between ministerial departments having stakes in REDD+ design and implementation (FCPF, 2015h). However, there is an overall acknowledgement by REDD+ countries that suitable legal, institutional and governance framework is important to guarantee the successful design and implementation of REDD+.

2.2.9. Voluntary carbon market

According to the latest state of voluntary carbon market (Hamrick and Goldstein 2016), the volume of voluntary offset transactions in 2015 increased by 10%, with the global volume-weighted average price dropping 14% to $3.3/tonne – a new low. Offsets from Reducing Emissions from Deforestation and forest Degradation (REDD+) were the second most sought-after project type in 2015, retaining high average price at $37.5 M. Supply exceeded the market demand and unsold 70.4 MtCO2e supply of 2015 issued in 2016, with offsets originating primarily from land use and forestry or renewable energy projects. In search of new market opportunities, REDD+ offsets are being pushed into the designing of the global market-based mechanism (GMBM) under into the International Civil Aviation Organization (ICAO) carbon emission reduction target for the industry. A recent presentation by ICAO's Air Transport Bureau estimates that airlines covered by the GMBM will generate an offset demand for between 288 MtCO2e and 376 MtCO2e by 2030.

While African carbon project development has historically lagged behind its Asian and Latin American counterparts, total offsets transacted are on the rise. African offset sales remained stable in 2015 at 6.7 MtCO2e, just slightly less than 2014's volume. In 2016, the total value of offsets originating in Africa was $24M, almost 20% of the global market value. African offset sales were at 5.8 MtCO2e – still larger than offsets transacted in Europe and Oceania (Hamrick and Goldstein 2017). The majority of the volume for 2015 originated from forestry or cookstoves projects as buyers sought to support emissions reductions that contributed to low-deforestation and sustainable development on the continent. Though average prices in 2015 decreased 9% to $5.2/tonne and further decreased in 2016 to $4.2/tCO2e, buyers paid more for African offsets. Buyers often contracted directly with

project developers: 54% of Africa's 2015 offset transactions represented primary market demand while the remaining 46% of tonnes were resold by secondary market actors.

According to Hamrick and Goldstein (2016, 2017), Kenya remained the primary source of offsets within the African region, supplying 3.1 MtCO2e from cookstoves and forestry projects, followed by Uganda, Zambia, Madagascar and Malawi. In 2016, Uganda took the lead offsetting 1.6 MtCO2e, followed by Kenya (1.3 MtCO2e) and then Ethiopia (58 KtCO2e). However, Ugandan offsets sold lower at an average price of $3.1/tCO2e compared to Kenyan ($5.4/tCO2e) and Ethiopian ($11.3/tCO2e) offsets. Forestry and land use continued to be the project category producing the most offsets in Africa especially through REDD+, agro-forestry, improved forest management, and afforestation / reforestation projects. Over 75% of Madagascar, Zambia, and the Democratic Republic of Congo (DRC) offsets were from forestry projects.

2.3. CONCLUSIONS

Many African countries are increasingly engaging in the REDD+ process to curb deforestation and forest degradation. Countries are at different stages in the process, with DRC taking a leading role in the REDD+ process in Africa. Most of the progress made in Africa can be seen in DRC, ranging from the development of R-PP, REDD+ strategy, to emission reduction programmes. DRC also benefits from funding coming from FCPF, Forest Investment Programme (FIP), UN-REDD and diverse bilateral funding from donors. A bulk of the other countries including Burkina Faso, Cameroon and Cote D'Ivoire are working hard to transit from the readiness phase (phase I) to the investment phase (phase II) and have also been able to mobilise some funds from similar sources like DRC. Madagascar has already developed a draft ERPD document which is pending approval by the Carbon Fund of the FCPF.

Despite all the progress made, the REDD+ process seems to be moving slowly at the national level due to many factors linked, but not limited to, weak and limiting capacity, lack of appropriate and sufficient technology to combat climate change, inadequate and ineffective use of finance, unclear and non-existing benefit sharing mechanisms, implementation of social and environmental safeguards; insufficient integration and capitalization of non-carbon benefits, weak institutional and governance arrangements and the discouraging prices in the voluntary carbon market. By taking steps to effectively address these challenges, REDD+ process has the potential to contribute in achieving some of the development goals of Cameroon, DRC, Madagascar, Cote d'Ivoire and Burkina Faso. Cameroon for instance adopted REDD+ as a development tool that will support the country to attain its 2035 Vision of becoming an emerging economy.

2.4. REFERENCES

Alemagi, D., Hajjar, R., Tchoundjeu, Z. and Kozak, R. A. 2013. Cameroon's environmental impact assessment decree and public participation in concession-based forestry: An exploratory assessment of eight forest-dependent communities. Journal of Sustainable Development, 6(10):8–24.

Aquino, A.; Guay, B. 2013. Implementing REDD+ in the Democratic Republic of Congo: An analysis of the emerging national REDD+ governance structure. For. Policy Econ. 36, 71–79.

Aquino, A.; Rakotorianina, P. 2013. REDD Funds Management in DRC—The Creation of the National REDD+ Fund. World Bank: Washington, DC, USA, 2013.

Bandiaky, S. and Tiani, A.M. 2010. Gender representation and participation in decentralized forest management: Case studies from Cameroon and Senegal. In: L.A. German, A. Karsenty and A.M. Tiani. Governing Africa's Forests in a Globalized World. Earthscan, London: 144–159.

Barquín, L., M. Chacón, S.N. Panfil, A. Adeleke, E. Florian, and R. Triraganon. 2014. The Knowledge and Skills Needed to Engage in REDD+: A Competencies Framework. Conservation International, Centro Agronómico Tropical de Investigación y Enseñanza, International Union for the Conservation of Nature, Regional Community Forestry Training Center. Arlington, Virginia, USA.

Brown, H.C.P. 2011. Gender, climate change and REDD+ in the Congo Basin forests of Central Africa. International Forestry Review 13(2):163–176.

Cerutti, P.O.; Lescuyer, G.; Assembe-Mvondo, S.; Tacconi, L. 2010. The Challenges of Redistributing Forest-Related Monetary Benefits to Local Communities: A decade of logging area fees in Cameroon. Int. For. Rev. 2, 130–138.

Corbera, E., and Schroeder, H. 2011. Governing and implementing REDD+. Environmental Science & Policy, 14(2), 89-99. doi: http://dx.doi.org/10.1016/j.envsci.2010.11.002

Dkamela, G.P. 2011. The context of REDD+ in Cameroon: drivers, actors and institutions. Occasional Paper 57. CIFOR, Bogor

Enongene K. and Fobissie K. 2016. The potential of REDD+ in supporting the transition to a

Green Economy in the Congo Basin. International Forestry Review 18(1):29-43

FCPF 2015a. Rapport de progression annuel REDD+ Pays: CAMEROUN Période: Septembre 2014-Aout 2015. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/August/FCPF_August2015_Cameroon_0.pdf

FCPF 2015b. Rapport de progression annuel REDD+ (avec une mise à jour semiannuelle) Pays : [BURKINA FASO] Période : [15 Aout 2014- 15 Aout 2015]. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/August/FCPF_August%202015_Burkina%20Faso.pdf

FCPF 2015c. Rapport de progression annuel REDD+ Pays: République Démocratique du Congo (RDC) Période: 15 Août 2014-15 Aout 2015. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/October/FCPF_August2015-DRC%20reformatted.pdf

FCPF. 2015d. Rapport de progression annuel REDD+ (avec une mise à jour semiannuelle) Pays : COTE D'IVOIRE Période : Janvier – Août 2015. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/August/FCPF_August2015_C%C3%B4te%20d%27Ivoire.pdf

FCPF 2017. The Carbon Fund. Retrieved from: https://www.forestcarbonpartnership.org/carbon-fund-0

FCPF. 2015e. REDD+ Countries. Retrieved from: https://www.forestcarbonpartnership.org/redd-countries-1.

FCPF. 2015f. ER-PINs in FCPF Pipeline. Retrieved from: https://www.forestcarbonpartnership.org/er-pins-fcpf-pipeline

FCPF. 2015h. Mid-term report on the implementation of REDD+ preparedness activities in Madagascar. https://www.forestcarbonpartnership.org/sites/fcp/files/2016/Aug/Madagascar%20MTR%20Final_BNC-REDD%2B_%2015072016.pdf.

Fobissie, K 2015. Landscape approaches in the Congo Basin: linking the Democratic Republic of Congo's Emission Reduction Program (ERP) and the Central Africa Regional Program for the Environment (CARPE). In Minang, P. A., van Noordwijk, M., Freeman, O. E., Mbow, C., de Leeuw, J., & Catacutan, D. (Eds.) Climate-Smart Landscapes: Multifunctionality in Practice, 361-371. World Agroforestry Centre (ICRAF). Nairobi, Kenya.

Fobissie, K. Alemagi. D. and Minang, P. 2014. REDD+ Policy Approaches in the Congo Basin: A Comparative Analysis of Cameroon and the Democratic Republic of Congo (DRC). Forests 5: 2400-2424

Freudenthal, E., Nnah, S. and Kenrick, J. 2011. REDD and Rights in Cameroon: A Review of the Treatment of Indigenous Peoples and Local Communities in Policies and Projects; Rights, Forests and Climate Briefing Series Forest Peoples Program: Moreton-in-Marsh, UK.

Government of DRC 2015. REDD+ Investment Plan (2015-2020). Forest Carbon Partnership Facility.

GoDRC 2016. Emission Reductions Program Document (ER-PD): Mai-Ndombe Emission Reduction Program, Democratic Republic of the Congo (DRC), Government of DRC. Kinshasa, DRC.

Government of Madagascar. 2017. Emission Reductions Program Document (ER-PD): Atiala Atsinanana Emission Reduction Program, Madagascar. Forest Carbon Partnership Facility. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2017/Sep/Advanced%20draft%20ERPD%20-%20MDG-Final.pdf

Hamrick K. and Goldstein A. 2016, Raising Ambition: State of the Voluntary Carbon Markets 2016. Forest Trend's Ecosystem Market Place.

Hamrick K. and Goldstein A. 2017. Unlocking potentials: State of the Voluntary Carbon Markets 2017. Regional analysis. Forest Trend's Ecosystem Market Place.

Jindal, R., Swallow, B., & Kerr, J. (2008). Forestry-based carbon sequestration projects in Africa: Potential benefits and challenges. Paper presented at the Natural Resources Forum.

Katerere Y. and Fobissie K. 2015. Non-carbon benefits: the key to successful REDD+ implementation in Africa. ClimDev-Africa Policy Brief 15. ECA, AfDB and AUC.

Korhonen-Kurki, K., Sehring, J., Brockhaus, M., Di Gregorio, M. 2014. Enabling factors for establishing REDD+ in a context of weak governance. Climate Policy, 14, 167-186.

Lang, C 2016. The World Bank "provisionally" approves the Democratic Republic of Congo's REDD programme. Retrieved from: http://www.redd-monitor.org/2016/06/28/the-world-bank-provisionally-approves-the-democratic-republic-of-congos-redd-programme/

Lotsch, A. 2011. Fitting Opportunity Cost Analysis in the REDD+ Preparation Process. Forest Carbon Partnership Facility. Retrieved from: http://www.forestcarbonpartnership.org/sites/fcp/files/Documents/tagged/8%20-%20OCA%20in%20REDD%2B%20Preparation%20-%20A.Lotsch.pdf

Mbow C., Skole D., Dieng M., Justice C., Kwesha D., Mane L., El Gamri M., Von Vordzogbe V. and Virji H., 2012. Challenges and Prospects for REDD+ in Africa: Desk Review of REDD+ Implementation in Africa, GLP Report No. 5, GLP – IPO, Copenhagen

Mpoyi A.M, Nyamwoga F.B, Kabamba F.M, and Assembe-Mvondo S. 2013. The context of REDD+ in the Democratic Republic of Congo: Drivers, agents and Institutions. Occasional Paper 94, Bogor Indonesia: CIFOR.

Nakhooda S. Caravani A. Bird N. and Schalatek L. 2011. Climate Finance in Sub-Saharan Africa. Climate Finance Policy Brief. Overseas Development Institute and Heinrich Böll Stiftung North America.

Oyono, P.R.; Kouna, C.; Mala, W. 2005. Benefits of forests in Cameroon. Global structure, issues involving access and decision-making hiccoughs. For. Policy Econ.7, 357–368.

Republic of Cote d'Ivoire 2016. Mid-Term Progress Reporting: Côte d'Ivoire Date of submission: May 24, 2016. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2016/May/MTR%20CIV%20English%20May%202016.pdf

Romijn E, Herold M, Kooistra L, MurdiyarsoD, Verchot L. 2012. Assessing capacities of non-Annex I countries for national forest monitoring in the context of REDD+. Env Sci & Policy 19-20: 33-48

Somorin O, Visseren-Hamakersb I.J, Arts B, Sonwaa D.J, Tiania A. 2014. REDD+ policy strategy in Cameroon: Actors, institutions and governance. Env Sci & Policy 35:87-97.

Tegegne, Y. Lindner, M. Fobissie, K. Kanninen, M. 2016. Evolution of drivers of deforestation and forest degradation in the Congo Basin forests: Exploring possible policy options to address forest loss. Land Use Policy 51(51):312-324.

Unruh, J. D. 2008. Carbon sequestration in Africa: The land tenure problem. Global Environmental Change, 18(4), 700-707. doi: http://dx.doi.org/10.1016/j.gloenvcha.2008.07.008

UNFCCC 2014. The Mechanisms under the Kyoto Protocol: Clean development mechanism, joint implementation and emissions trading. Retrieved from: http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php

UNFCCC 2016. REDD+ Web Platform. Retrieved from: http://redd.unfccc.int/submissions.html?organization=17

World Bank 2011. Second grant agreement for preparation of DRC's Readiness Plan, Readiness Fund of the FCPF Grant No. TF099125. Retrieved from: https://www.forestcarbonpartnership.org/sites/forestcarbonpartnership.org/files/Documents/PDF/Apr2011/2nd_Grant_Agreement_DRC_RPP.pdf

World Bank 2014. Grant agreement for Republic of Cote d'Ivoire Readiness Preparation Proposal Readiness Fund of the FCPF Grant No. TF018008. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/April/FCPF_RCI_GA_9-22-2014%20Signed%20PDF..pdf

World Bank 2013. Second grant agreement for the Republic of Cameroon Readiness Preparation Proposal Readiness Fund of the FCPF-Grant No. TF015355. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2014/MArch/March/Cameroon%20grant%20agreement.pdf

World Bank 2015a. Grant agreement for the Burkina Faso's Readiness Preparation Proposal Readiness Fund of the FCPF Grant No. TF017919. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/April/Lettre%20d%27accord.pdf

World Bank 2015b. Grant agreement for the Republic of Madagascar's Readiness Preparation Proposal Readiness Fund of the FCPF Grant No. TF0A0104. Retrieved from: https://www.forestcarbonpartnership.org/sites/fcp/files/2015/August/Accord%20de%20Don%20RPP_FCPF_Madagascar.pdf

CHAPTER 3: Forest-based CDM

3.1. INTRODUCTION

The CDM mechanism is one of the three mechanisms of the Kyoto Protocol that the UNFCCC is using to achieve its major objective of stabilizing greenhouse gas concentration in the atmosphere at a level that will prevent anthropogenic interference with the climate system. Despite the many economic, social and environmental benefits CDM afforestation and reforestation (CDM A/R) activities offer, many countries especially developing countries are still far behind concerning the development and implementation of CDM A/R (Thomas et al., 2010). Based on the institutional and technical characteristics of the CDM A/R process, this section provides an overview of Africa's involvement in the A/R aspects of the CDM initiative. Two key questions are addressed: (a) What are the rationales for the current situation of forest based CDM A/R activities in Africa? (b)What are the prospects of CDM A/R activities to contribute to climate change mitigation while promoting sustainable development in Africa?

3.1.1. General institutional framework of the CDM

i) Justification for the CDM

The CDM was created under the Kyoto Protocol of UNFCCC, to respond to two principal issues: firstly, to assist Annex 1 countries to meet their emission reduction targets in a cost-effective manner and, secondly, to assist non-Annex 1 countries to achieve sustainable development while contributing to GHG emission reduction. As part of the CDM mechanism, projects that reduce emissions in developing countries earn carbon credits qualified as certified emission reduction (CERs), measured in tons of CO2-equivilent. Buyers from developed countries acquire CERs for each ton of GHG that is prevented from entering the atmosphere as a result of a CDM project in a developing country. The credits can then be used by industrialized countries to meet part of their emission reduction targets under the Kyoto Protocol. Furthermore, to provide opportunities to contribute to sustainable development, 2 % of the proceeds from every CDM project is channeled to the Adaptation Fund, which is used to finance adaptation programs and projects in developing countries.

(ii) Institution setting

The CDM became operational beginning 2006. It is supervised by the CDM Executive Board (CDM EB) under the authority of the Conference of Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). The board which is responsible for managing operations is composed of ten representatives of governments from both developed and developing countries which are members of the Kyoto Protocol. The CDM EB submits annual reports to the CMP and incorporates decisions from CMP concerning the functioning

of the CDM mechanism. The board is supported by working groups and panels e.g. Methodologies panel, Accreditation Panel, Afforestation & Reforestation Working Group, Registration and Issuance Team, Small Scale Working Group, Carbon Dioxide Capture and Storage Working group. These provide support such as approving projects for registration, issuing CERs, accrediting Designated Operational Entities (DOEs). DOEs are private certifiers who validate projects and verify emission reductions. Designated National Authorities (DNAs) also provide support to the board by approving projects and facilitating participation. The UNFCCC secretariat provides overall services to the board and its related bodies and working groups such as the verification of completeness and accuracy of projects requesting registration (UNFCCC, 2016a).

(iii) Project cycle and actors

The CDM is operationalized through seven steps: (1) project design; (2) national approval; (3) validation; (4) registration; (5) monitoring; (6) verification; (7) CER issuance. The tasks of project design, implementation and monitoring of emissions are the responsibility of the project participants, which may be private or public entities. In A/R projects, the project design involves the submission of a project design document (PDD) and a proposal for a baseline and monitoring methodology to be approved by the board. The technical complexity required at this stage often pushes developing country entities to involve consultants mostly from developed countries. The PDD must receive authorization from the host country's DNA, which verifies and confirms that the participation of the project is voluntary, and has potentials to contribute to sustainable development. Before registration, the project will undergo validation by the DOE, certified by the CDM Board. The DOE then submits the project to the CDM Board for registration which makes a formal recognition that the project is capable of producing emission reduction credits. After registration the project participants monitor the emissions according to the approved methodology, make a request to the DOE for verification. The DOE submits the verification report to the board and CERs will finally be issued if approved. CERs may be generated for an approved crediting period of ten years (non –renewable), or seven years (renewable twice for a total of 21 years) (UNFCCC 2016b).

3.1.2. Technical issues of the CDM

(i) Environmental impacts of A/R activities

Project participants are requested to carry out and document an analysis of the environmental impacts of the proposed CDM A/R project activity, including impacts on biodiversity and natural ecosystems and impacts outside the project boundary. In situations where project participants or the host Party consider the environmental impacts of the proposed A/R CDM project activity significant, project participants shall carry out an environmental impact assessment in accordance with the host Party's procedures. In a scenario where, environmental impacts of the proposed A/R CDM project activity are

considered significant, project participants shall provide a description of the planned monitoring and remedial measures to address these significant impacts (UNFCCC, 2016c).

(ii) Socio-economic impacts of A/R activities

Project participants are requested to carry out and document an analysis of the major socio-economic impacts of the proposed A/R CDM project activity, including impacts outside the project boundary. In circumstances where project participants or the host Party consider any negative impact as significant, project participants shall carry out a socio-economic impact assessment, in accordance with the host Party's procedures. In situations where socio-economic impacts of the proposed A/R CDM project activity are considered significant, project participants shall provide a description of the planned monitoring and remedial measures to address these significant impacts (UNFCCC, 2016c).

(iii) Additionality, permanence and leakage

Additionality is a principal condition for the eligibility of a project under the CDM. Additionality is the requirement that the greenhouse gas removals after the implementation of the A/R project activity are greater than those that would have occurred in the baseline scenario (the most plausible alternative scenario to the implementation of the A/R project activity). This baseline scenario may be the business-as-usual case (that is, the continuation of current sequestration levels in the absence of the CDM project activity), or it may be some other scenario which involves a gradual increase in sequestration. The baseline scenario represents the emission scenario in the absence of the project, and CDM A/R projects are requested to build sound baseline scenarios based on current land uses or historical land uses occurring since 1990 showing that forestation due to project activities will not occur in any baseline scenarios. Once established, the baseline scenario can be used to determine (i) whether a CDM project activity is additional (i) the volume of additional greenhouse gas sequestrations achieved by a project activity (CDM Rulebook, undated).

Emission reductions generated by forest carbon projects are always threatened by the issue of non-permanence. This indicates that project proponents cannot guarantee that carbon capture during project activities will never return to the atmosphere. To address this issue, CDM A/R projects are issued with a special kind of CERs which may be valid for a given commitment period i.e. temporary CERs (tCERs) for a certain crediting period i.e. long term CERs (1CERs). And project proponents must ensure that the carbon must remain in the trees over the period in which they are valid. At the end of the crediting period buyers must replace their expired tCERS and 1CERs with other tCERs and 1CERs. This is why credits generated by A/R projects are experiencing lower prices than credits produced by other projects in the compliance markets. Projects are requested to use the CDM approved methodology to measure and mitigate leakage and to subtract a number of credits from the emissions claimed accordingly (Cisneros, 2012).

3.2. AFRICA IN THE COMPLIANCE CARBON MARKET

The African continent is one of the most underrepresented regions in the CDM in general and in the proportion of projects by sector in particular. In the compliance market, investors are interested in projects that deliver high emission reductions at a lower cost and with limited risks. As of January 2016, only about 2 percent of registered projects were located in Africa i.e. about 200 out of the 7690 total registered projects. Asia Pacific especially China, India and South Korea has the greater share of the registered projects. Latin America follows principally dominated by projects from Brazil, Mexico and Chile (UNFCC, 2016d).

An analysis at the end of the first commitment period of the Kyoto Protocol indicates that only 39 of the CDM projects found at the different stages of the CDM cycle were A/R projects. Among all the projects, 12 were situated in Africa (31 %), 14 in Latin America (36%), 11 in Asia (28%), and 2 in Eastern Europe (2%). Despite the fact that A/R projects in Africa and Latin America occupy almost the same proportion of A/R projects, they have differences in terms of the CERs they deliver. Africa is the region with the smallest quantity of issued CERs in the world even below Eastern Europe which hosts only 2 projects. African projects represent 12% of the total expected CERs from A/R projects under the CDM. This is as opposed to Latin America, Asia and Eastern Europe with 47%, 26% and 15% of CERs from A/R projects respectively (Cisneros, 2012).

Furthermore, the situation of A/R projects in Africa at the end of the first commitment period of the Kyoto Protocol shows that all projects are distributed in five countries, namely Uganda (6 projects), Kenya (3 projects), and Senegal, Ethiopia and DRC having one each. The largest quantity of CERs in Africa came from the DRC and Uganda. Investment for these different projects came from Italy, Spain, Canada, Japan, France, and Luxembourg (Cisneros, 2012). As of January 2018, the CDM project pipeline indicates 71 A/R projects (UNEP DTU, 2018), with Africa still scoring very low in terms of the project distribution according to regions, hosting 28% (20 projects) of the global A/R projects in the CDM pipeline. There exists a total of 228 CDM pipeline projects hosted in Africa. Hence A/R projects constitutes 8.77% of the total CDM projects hosted in the African continent.

3.3. IMPLEMENTATION OF CDM A/R PROJECTS IN AFRICA: CASE OF THE DRC

3.3.1. Status and potential of CDM A/R development in the DRC

The DRC is currently having four projects in the CDM project pipeline. These include two registered and two at the validation stage. Two of these projects are CDM A/R projects (Table 5).The DRC is home to the second largest rain forest of the world, with an estimated carbon stock of about 20.4 to 36.7 billion tonnes of carbon. This gives the DRC important potential for forest carbon activities. The forest carbon potential of the DRC has been

recognized internationally, and in addition to the fact that it is hosting two CDM A/R projects, the DRC is also a target country for the UN-REDD program, the FCPF initiative and the Forest Investment Program.

In the DRC, CDM A/R activities are possible under the CDM on degraded forest lands. Despite this huge potential to contribute to climate change mitigation through forest regeneration, CDM A/R activities have generally remained underdeveloped compared to other sectors. Notwithstanding, two CDM A/R projects have attracted substantial attention, demonstrating the potential for abatement in the LULUCF sector, and generating financial flows from forest carbon activities under the CDM (Table 5). The first CDM A/R project to be successfully registered is the Ibi Batéké Afforestation project with credit being sold to the World Bank Biocarbon Fund. The second is the Establishment of the Bonobo 'Peace Forests', which is currently at the validation stage since its submission in 2008. It seeks to realize a standard habitat and forest corridors linking viable populations of the endangered great ape, endemic to the forest of the DRC Congo basin (UNEP RISO, 2013).

Table 5: Snapshot of CDM projects in the DRC

Project Title	Status	Type	TCO_2 Reduction/year	Date of Submission
Ibi Batéké degraded savanna afforestation project for fuelwood production	Registered	Afforestation	54,11	07/01/2009
Kinshasa Landfill gas recovery and flaring project	Registered	Landfill gas	124,819	22/01/2010
Reforestation project using native species in Maringa-Lopori-Wamba region (Democratic Republic of the Congo): establishment of the "Bonobo Peace Forest	At validation	Reforestation	135,632	04/03/2008
Mikalili efficient Fuelwood cook stoves project	At validation	EE Households	167,257	09/11/2011

Source: UNEP RISO, 2013

3.3.2. Ibi Batéké degraded savanna afforestation project in DRC

Here we present how the project is described by the project proponents in relation to the CDM A/R technical aspects such as the problems, solutions, social and environmental impacts, actors and the carbon context. It should be noted that the description is a reflection of their opinions and justification for carbon funding. This implies other stakeholders might have different views regarding the ecological, social and financial dynamics of the project.

(i) Problems

The ecosystem on the Batéké plateau is made of dry forest, resulting from an abrupt climatic change to drier conditions. About 90% of the plateau is covered by wooded savanna, characterized by grass or woody savanna growth. About 10 % of the plateau is forest gallary subject to uncontrolled deforestation and degradation due to subsistence agriculture and charcoal production. The savanna experiences forest fires several times a year, from causes which are principally anthropogenic. In this condition, the fire events impede the invasion and successful growth of woody plants, especially trees.

(ii) Propose solutions and objectives

To improve on the forest and land management on the plateau, the Ibi Batéké project is converting 4200 hectares of natural grassy savanna to an abundant and sustainable fuelwood supply for charcoal production. The project is mobilizing the leading local population and farmers to stop the destruction of natural forests and to concentrate on planting managed forests. The degraded lands are being transformed into managed forests of acacia, eucalyptus and indigenous species that will sequester carbon and contribute to the supply of fuelwood for the local population and the 8-10 million inhabitants of the capital city Kinshasa. The project proponents had the intention to introduce an integrated rural development strategy by integrating agriculture, livestock and forest production of commodities such as cassava flour, corn flour, with a strong participation of local communities.

(iii) Actors

The project proponent is NOVACEL, founded by local people from the region. The World Bank Biocarbon Fund was instrumental in enabling NOVACEL, to obtain the private sector loans to finance project upfront investments and facilitated the participation of a second carbon buyer, ORBEO, a subsidiary of the French conglomerate Societe Generale and Rhodia. The project also benefited from investments from UMICORE, SUEZ, and French Development Agency. The UNEP CASCADe program is responsible for providing technical assistance.

(iv) Social and environmental impacts

The project is enhancing local employment opportunities by providing both permanent forest management jobs and temporary jobs in harvesting, timber processing, and charcoal production. In addition, by supplying the capital city of Kinshasa with charcoal from sustainable fuelwood production, the project is preserving forest resources for future generations. Project activities are contributing to poverty alleviation through the introduction of long-term income enhancement mechanisms for local communities.

The plantation is using different tree species to reduce pest risks, to increase soil nutrients and diversify wood utilization after harvest. Erosion will be controlled and reduced thanks to the forest root network and to specific land management activities. Soil fertility will be

maintained and even improved e.g. enrichment in carbon and nitrogen and improvement of root permeability. Soil fauna will be increased as a result of the change in the microclimate and soil ecosystem modification. The planted forest will provide new habitats where wildlife can shelter. Biodiversity and wildlife flow will also increase between the Ibi area and the neighboring Bombo Lumene nature reserve. The project is also avoiding bush fires and their associated negative impacts on soils and ecosystems, through awareness raising and environmental education on fire management and control.

CDM A/R project development and implementation process lacks detailed socio-economic and environmental assessments, and measurement, reporting and verification of social and environmental impacts during project implementation (Corbera and Friedli, 2012, Chia et al., 2016).

(v) Carbon context

The project went operational in July 2008, with a life time of over 30 years, which also represents the length of the fixed crediting period. The project is estimated to generate an estimated 54, 511 tonnes of CO^2 equivalent per annum, which will amount to an estimated 16 35330 tonnes of CO^2 equivalent over the expected crediting period. According to the approved methodology employed by the project, the carbon pools included in the baseline are the above- ground biomass and the below – ground biomass. The dead-wood, litter and soil organic carbon were excluded from the baseline.

The project has some measures to minimize potential carbon leakage. Agriculture in the area is mostly subsistence, especially cassava cultivation. Thus, the cassava will be intercropped between tree rows for an estimated area of about 8 000 hectares. Villagers use shrubs, grasses and/or deadwood for cooking and heating. And since the population density in this area is low, the human pressure will also be low. Furthermore, the few farmers in the area will be able to collect fuelwood within the project boundary without compromising the growth of trees establishmed under the CDM A/R project activity. Such fuelwood includes deadwood, branches, and grasses/shrubs growing between the trees during the early stages of the establishment. In this condition, farmers will have no reason to collect fuelwood outside the project boundary.

3.4. BENEFIT SHARING IN CDM A/R

At the moment, there are no institutional means, governance structures and instruments to guide the distribution of net benefits from the implementation of CDM A/R activities in the DRC. To distribute benefits from carbon initiatives, governments are hoping to build on existing legal and institutional revenue distribution mechanisms being applied in the distribution of revenues from the exploitation of forests and other natural resources. However, analysis of these existing benefits sharing mechanisms in some rainforest countries e.g. Cameroon, indicates that governance and institutional reforms are required to make these mechanisms respond to the expectations of making carbon initiatives equitable and contribute to poverty alleviation (Assembe-Mvondo et al., 2015).

The project design document of the Ibi Batéké afforestation project in the DRC indicates that local farmers in the project area are involved in the project through the planting of trees in their farms and are making efforts to consume fuelwood sustainably. This implies that they need to be compensated for their efforts to sequester carbon dioxide, especially the farmers whose trees are included in the carbon accounting. The compensation is supposed to flow as direct and indirect net gains, and distributed to community project participants using a clear benefit sharing mechanism. Presenting a clear and concise benefit sharing mechanism in the PDD document indicates that a project has intentions to actually contribute to poverty alleviation and community well-being. It should be noted that the CDM A/R project design requirements do not oblige project proponents to present a benefit sharing mechanism. Designing equitable benefit sharing schemes that effectively improve local livelihoods is important to guarantee project success and sustainability (World Bank, 2011). CDM A/R projects also lack rigorous information on benefit sharing and in so doing they disguise who will benefit from carbon trading (Corbera and Friedli, 2012).

This situation is opposed to the forest carbon A/R project development and implementation in the voluntary carbon markets. The A/R forest carbon development standards in the voluntary carbon market interested in promoting community welfare and equity are keen for projects to show how they will proceed with benefit sharing in case emission credits are successfully sold. The benefit sharing requirement for the case of the Plan Vivo standard is presented in Box 3.

Box 3: Benefit sharing requirements: Case of the Plan Vivo Standard

To develop forest carbon credits through the Plan Vivo standard, project proponents must adhere and respond to the benefit sharing requirements when developing the project design document (PDD), which are then evaluated before approval. In the PDD, project proponents are expected to:

- Provide a description of the financial structure for the project, showing how benefits will be distributed in the project, and the approximate proportions of carbon finance to be received by the project proponents and all other project participants and beneficiaries (including producers and community groups)

- Describe measures to ensure sharing of benefits is transparent and the project proponent is accountable for safeguarding project funds.

- Include a diagram showing how funds will flow through the project

- And describe any additional businesses or livelihood improvement activities that will be supported by the project (e.g. carpentry or beekeeping) and describe how benefits will be distributed

Source: Plan Vivo, 2012

3.5. LEGAL, POLICY AND INSTITUTIONAL ARRANGEMENTS

In the CDM A/R, actors interact at various levels governed by rules and regulations that shape the design and implementation of CDM A/R projects. At the international level, the UNFCCC and its subsidiary bodies generate information and knowledge on CDM A/R activities, applicable at the global, national and local levels. The knowledge and information they generate, forms the basis for other opportunities such as the creation of funding mechanisms and technical support systems by multilateral agencies – World Bank, UN bodies and research institutions, and private sector investment interest. At the national level, government ministries and related agencies formulate, guide and facilitate the implementation of CDM A/R activities. They are important in integrating global directives into broader national level policies and legal instruments e.g. defining resource rights in relation to tenure, trees and carbon.

In the DRC and other rainforest countries, there is no specific legal and institutional framework for CDM AR/ activities. Existing legal and policy frameworks on forest resource exploitation and regeneration i.e. afforestation and reforestation, form the basis for regulating CDM activities in the DRC. There have been some legislative reforms in 2014 to integrate the response to climate change in ongoing nature protection efforts. For example, Law No. 14/003 on the Protection of Nature, mandates the government to take into account the potential value of forest carbon sequestration services for climate change mitigation while elaborating the national strategy on the Protection of nature and the National forestry programme. Furthermore, the law calls on the central and regional governments to adopt and implement policies and plans and programs promoting the contribution of natural and biological resources and ecosystems to poverty reduction and climate change response (Nachmany et al., 2015).

The Ministry of Environment, Nature Conservation and Tourism (MENCT) is responsible for the formulation and implementation of climate change response strategies in the context of forest and land use. The Designated National Authority (DNA) of the UNFCCC lies with the MENCT, which oversees the expansion of afforestation and reforestation projects to create carbon sinks (GoDRC, 2009).

3.6. CHALLENGES AND OPPORTUNITIES

In this section, we present the challenges and opportunities of CDM A/R project development and implementation in Africa, with some examples from the DRC. The challenges and opportunities are endogenous and exogenous.

3.6.1 Challenges

(i) Weak institutional capacity

Lack of institutional and organizational capacity to establish and manage carbon projects, and to establish links with international buyers is a major weakness for the success of CDM A/R in Africa. Adequate national institutional capacity is required to mobilize relevant stakeholders, in both the private and public sectors, and to facilitate the establishment of viable carbon projects (Jindal et al., 2008). In the DRC and in many other African countries, the DNAs are responsible for mobilizing international investors and local service providers, though they are not capable of ensuring coherence, justifiable and transparent assessments to generate enough revenue through the different assessments to auto finance their activities. This situation is further aggravated by the lack of a clear legal and policy framework to facilitate the DNAs to execute the various tasks assigned to them.

(ii) Weak governance capacity

A/R projects for the carbon markets have long gestation periods and any investment is likely to be a risk, unless backed by sustained economic and political stability. Good governance practices at the national and local levels are essential to attract and support international carbon project investments in the long-term (Jindal et al., 2008). The DRC and many other African countries are politically fragile coupled with unpredictable governance systems, thus making investment in carbon projects a risky business option for investors. Mobilizing private investors for A/R is difficult since these activities have mainly been carried out through government or donor-support development projects in most African countries (Desanker, 2005). The governance system of the DRC is characterized by corruption, lack of transparency and accountability, and weak law enforcement (Samndong and Nhantumbo, 2015). These are strong indicators of poor business climate, thus risky for investors.

(iii) Complex land tenure systems

Tenure security is crucial for the implementation of A/R projects. Without clear and defendable rights to land and forests and/or carbon rights, service providers cannot make any trustworthy long-term engagement to supply carbon credits (Jindal et al., 2008). On the demand side investors may have little or no confidence to invest in project activities with unclear tenure arrangements. In Africa, land tenure is complex, characterized by: (i) prevalent disconnect and conflict between customary and statutory land rights, (ii) legal pluralism i.e. lack of uniform set of statutory laws regarding tenure, (iii) tree tenure i.e. contested position over using tree planting as a mechanism to claim rights over land, (iv) and the challenge in using abandoned land (Unruh, 2008). Tenure security for the Ibi Bateke project in the DRC is based on customary or traditional land rights which the right holders have been exercising for many decades. However, in a scenario where the country has a national interest on the Bateke plateau e.g. a new discovery of oil and gas in the

plateau, statutory land rights will override customary or traditional land rights. Insecure land and resource tenure is responsible for natural forest resource degradation in the DRC (Oyono and Barrow, 2011).

(iv) Financial constraints

There are a number of financial weaknesses associated with the design and implementation of CDMA/R projects in Africa. A/R carbon projects take a long time to start receiving revenue from emission credits generated. This delay in return serves as disincentives for landowners to engage in CDM A/R projects. This is coupled with the fact that many project proponents lack investment capital to cover the startup and other associated costs over the many years before income from carbon sales starts to ensue (Thomas et al., 2010, Desanker, 2005). Project proponents in Africa are often discouraged by the transaction cost involved in designing and operationalizing A/R carbon projects. Transaction cost includes cost of negotiating, contracting, implementation and monitoring project activities. And these are different cost portions that need to be covered by upfront investments, before the sales of emission credits proper. CDM A/R projects with multiple contract holders, which is often the situation for projects in Africa, incur high transaction cost as compared to when dealing with single landholders (Thomas et al., 2010, Jindal et al., 2008).

(v) Limited technical capacity

The CDM A/R project development process is complex for African countries. The project development process is required to respond to a number of prerequisites including the establishment of a baseline, proof of additionality, selection of appropriate methodology, managing leakage and non-permanence, and the clarification of monitoring and validation procedures. There is lack of national technical capacity to respond to the technical demands of the CDM A/R process without reliance on expensive external technical support (Desanker, 2005). The two CDM A/R carbon projects in the DRC are receiving technical support from external partners. Lack of technical capacity in forestry management is a weakness which has been facing the DRC and other rainforest countries in Africa. This has led to the weak application of the forest legislation, hence resulting to over exploitation and unsustainable use of forest resources (Samndong and Nhantumbo, 2015).

In some African countries, there is lack of technical capacity to coordinate, manage collaboration and create consensus between the many stakeholders (laborers, landowners, project proponents, external investors and government officials involved in carbon project activities (Thomas et al., 2010). The CDM EB is making efforts to simplify the CDM methodology to encourage project development in Africa and other developing countries. However, a detailed analysis is required to determine if the reforms undertaken by the Board have responded to some or all of the technical weaknesses of CDM A/R project proponents in Africa. In addition to the internal challenges, there are some other challenges that are out of the control of governments and other CDM A/R stakeholders in Africa. First, the CDM A/R complex methodology is a threat to CDM A/R development in Africa. The methodology requires a complex technology which is costly. This causes investors to turn to

other less costly CDM technologies involving manageable risks. The CDM A/R requires great measurements in the field, demonstration of land eligibility and the boundaries of plantations have to be defined (Chenost et al., 2010). However, these technical hurdles are shrinking as more projects are being developed and the experiences increasing among project developers and investors. Many methodologies are now available as well as a number of official tools to aid project proponents to demonstrate project additionality, account for carbon sequestration and in choosing the right methodology.

Secondly, there is limited market demand for CDM A/R credits. There is uncertainty on the availability of markets for emission reductions, especially the reluctance by many buyers in the developed countries to consider credits from forestry activities (Desanker, 2005). For example, the European Union Emission Trading Scheme (EU ETS) which is the largest and the most mature carbon market does not accept credits generated from forestry activities. Furthermore, other national level emission trading schemes e.g. California and New Zealand currently do not accept international offsets from forestry. Thirdly, the volatility of international carbon prices is major threat to A/R carbon forest investment in Africa and other developing countries.

In recent times the compliance markets have experienced a collapse in the price of carbon credits. In 2009, credits in the EU ETS sold for €30, while in 2011; carbon credits were declared the world's worst performing commodity. Currently, the price of CERs from the CDM is €0.67 (Lang, 2015). The voluntary carbon market is also facing decreasing prices due to the fact that the demand for carbon credits went down over recent years, while supply was on the rise. The average price of voluntary carbon offset reached an all-time low of US $3.8 (Hamrick and Goldstein, 2015). There are strong arguments that markets for carbon forestry credits will not deliver for governments, the forests and peoples of the south (Lang, 2015).

(vi) Strengths and prospects

The DRC and the other African countries have considerable CDM A/R potentials, notably in the form of their remarkable spatial and ecological characteristics. The African continent with its diverse forest types has an abundant expanse of biophysically suitable land which could be used for placing carbon in landscapes through A/R projects (Unruh, 2008). Globally, out of the 749 Mha of biophysically suitable land that meets the CDM A/R eligible criteria, 27% is found in Sub Saharan Africa, comprising principally of shrubland, grassland and savanna (Zomer et al., 2008). The high degree of land degradation in many African countries and the heavy dependence on wood resources (biomass) for energy is a strong asset for African countries to engage in A/R carbon sink projects without second judgment. Furthermore, the low technology requirements to grow trees and the livelihood benefits are a strong motivation and incentive for rural communities in Africa to engage in A/R carbon activities (Desanker, 2005).

3.7. CONCLUSIONS

Africa is not scoring high in the CDM compliance market in terms of developing and implementing CDM A/R carbon projects. It is not generating enough emission reduction credits for the carbon market, thus limiting the expected role of forest in climate change mitigation. The reasons for this situation are both endogenous and exogenous. Africa possesses high biophysical and spatial potentials for carbon sequestration. However, the low socio-political potential is a serious predicament for carbon storage in the African continent. There is need to improve governance, institutional and technical capacity, tenure, business climate to attract investors. Increased market access for CERs from A/R projects and encouraging stable market prices for CER credits will motivate ongoing efforts to develop carbon sink projects in Africa.

Africa needs to make progress on the contribution of forest in carbon sequestration. This is relevant for the post 2020 carbon emission reduction engagements. The continent should be aggressive in the international negotiation process to influence current reform efforts, for CDM to work for them i.e. fighting for favorable and realistic international modalities and procedures for forest carbon development. National governments need to build enabling environment and policy frameworks for investment, financing and forest carbon development.

3.8. REFERENCES

Assembe-Mvondo, S., Wong, G., Loft, L. & Tjajadi, J. S. 2015. Comparative assessment of forest revenue redistribution mechanisms in Cameroon: Lessons for REDD+ benefit sharing, CIFOR.

CDM Rule book (undated). Large Scale>Baseline and Additionality. http://www.cdmrulebook.org/83.html. Accessed 20/02/2016.

Chenost, C., Gardette, Y.-M., Demenois, J., Grondard, N., Perrier, M. & Wemaere, M. 2010. Bringing forest carbon projects to the market, UNEP Paris, France.

Chia, E. L., Fobissie, K. & Kanninen, M. 2016. Exploring Opportunities for Promoting Synergies between Climate Change Adaptation and Mitigation in Forest Carbon Initiatives. Forests, 7, 24.

Cisneros, J. A. F. 2012. „Forest carbon projects in Africa: A mapping study". Steps Centre, p14.

Corbera, E. & Friedli, C. 2012. Planting trees through the Clean Development Mechanism: A critical assessment. ephemera, 12, 206.

Desanker, P. 2005. The Kyoto Protocol and the CDM in Africa: a good idea but. UNASYLVA-FAO-, 56, 24.

GoDRC, 2009. DRC REDD+ Potential. Democratic Republic of Congo. Ministry of Environment, Nature Conservation and Tourism. http://redd.unfccc.int/uploads/2_183_eng_final_report_exploring_redd_potential_071209.pdf. Accessed 25/01/2016.

GoDRC 2016. Mai-Ndombe Emission Reductions Program document (ERPD), Democratic Republic of Congo. https://www.forestcarbonpartnership.org/sites/fcp/files/2016/Dec/20161108%20Revised%20ERPD_DRC.pdf

Hamrick, K. & Goldstein, A. 2016. A head of the Curve: State of the Voluntary Carbon Market 2016. Washington Forest Trends'Ecosystem Marketplace.

Jindal, R., Swallow, B. & Kerr, J. 2008. Forestry-based carbon sequestration projects in Africa: Potential benefits and challenges. Natural Resources Forum, 32, 116-130.

Lang Chris, 2015. Will carbon markets ever deliver for southern governments, forests and people? REDD monitor. http://www.redd-monitor.org/2015/12/09/will-carbon-markets-ever-deliver-for-southern-governments-forests-and-people/. Acessed 26/02/2016.

Nachmany, M., Fankhauser, S., Davidová, J., Kingsmill, N., Landesman, T., Roppongi, H., Schleifer, P., Setzer, J., Sharman, A., Singleton, C. S., Sundaresan, J. & Townshend, T.

2015. The 2015 Global Climate Legislation Study :A Review of Climate Change Legislation in 99 Countries. London: Gramtham Research Institute

Oyono, P.R., Barrow, E. 2011. Mapping forest tenure in Central Africa in the dawn of the new century: Transitions or hidden-status-quo? Working Paper. Program of Land and Agrarian Studies, University of Western Cape, Cape Town.

Plan Vivo, 2012. Plan Vivo Project Design Document Template. 2012 version.

Samndong, R. A. & Nhantumbo, I. 2015. Natural resources governance in the Democratic Republic of Congo. IIED Country Report. London IIED.

Thomas, S., Dargusch, P., Harrison, S. & Herbohn, J. 2010. Why are there so few afforestation and reforestation Clean Development Mechanism projects? Land use policy, 27, 880-887.

Unruh, J. D. 2008. Carbon sequestration in Africa: The land tenure problem. Global Environmental Change, 18, 700-707.

UNEP RISO, 2013.EMISSIONS REDUCTION PROFILE: Democratic Republic of Congo. http://www.acp-cd4cdm.org/media/366216/emissions-reduction-profile-dr_congo.pdf. Accessed 20/02/2016.

UNEP DTU (2018). CDM projects by type. Retrieved from: http://cdmpipeline.org/cdm-projects-type.htm

UNFCCC 2016a. Clean Development Mechanism > Governance. https://cdm.unfccc.int/EB/governance.html.Accessed 15/02/2016

UNFCCC 2016b. Clean Development Mechanism > . https://cdm.unfccc.int/filestorage/D/J/T/DJTQLUWZK48AGFP2RIO0H7YV3S1CE9/eb86_repan06.pdf?t=QkV8bzNheG1xfDBNNrdcNcWT-OkcCjZpLbQh. Accessed 15/02/2016

UNFCCC 2016c. Clean Development Mechanism Project Standard, Version 9.0. At: https://cdm.unfccc.int/. Accessed 20/02/2016

UNFCCC 2016d. Clean Development Mechanism. https://cdm.unfccc.int/Projects/projsearch.html. Accessed 20/02/2016

World Bank, 2011. The BioCarbon Fund Experience: Insights from Afforestation/Reforestation (A/R) Clean Development Mechanism (CDM) Projects. http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/BioCarbon_Fund_Experience_Insights_from_AR_CDM_Projects.pdf. Accessed 25/02/2016.

Zomer, R. J., Trabucco, A., Bossio, D. A. & Verchot, L. V. 2008. Climate change mitigation: A spatial analysis of global land suitability for clean development mechanism afforestation and reforestation. Agriculture, ecosystems & environment, 126, 67-80.

CHAPTER 4: AFOLU NDC - TRENDS, OPTIONS AND OUTLOOK FOR AFRICA

4.1. INTRODUCTION

In December 2015, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) successfully negotiated a new international climate agreement. The agreement is a breakthrough in international climate policy in which there was a global effort to tackle climate change. The agreement had a multilateral dimension, as developed and developing countries agreed to take action based on national circumstances and towards an agreed long-term goal, which includes keeping temperature well below 2°C, while also making effort to stay below 1.5°C.

The agreement is the fruit of many years of negotiations under the UNFCCC, for which a formal mandate was adopted in 2011 in Durban, to negotiate a new agreement. It is clear that the success of the agreement depends on the sustained political momentum for actual and progressively more ambitious implementation through domestic policies and actions. Over the years, governments have portrayed their political momentum through their bilateral and multilateral networks e.g. G7, G20, United States and China joint declarations, to build agreements on critical issues prior to the finalization in Paris. Furthermore, significant momentum was created when countries, after the COP20 in Lima, started to formulate and submit individual national climate action plans during 2015. The national plans called Nationally Determined Contributions (NDCs), gave opportunities for the first time for many governments to formulate a complete vision for addressing climate change (Bodle et al, 2016). At the international level, the NDCs demonstrates the political will of governments and serves as an indication of their readiness to contribute to the global effort to combat climate change.

The NDCs were part of the bases of the Paris Agreement i.e. the post-2020 global emissions reduction commitments. NDCs link national policy frameworks i.e. governments determine their contributions in the context of their national circumstances, priorities and capabilities, with the global framework that drives the collective action towards a low-carbon, climate resilient future. The process gave countries the important means to communicate internationally the steps they will take to address climate change in their respective countries. It reflected each country's ambition to reduce emissions taking into account national circumstances and capabilities. Some countries included how they will address the adaptation to climate change impacts and what support they need from, or will provide to, other countries to adopt low-carbon pathways and to build climate resilience.

With regard to the emission reduction targets of the NDCs, there has been considerable progress compared to the “business as usual” scenarios. However, there is a gap between emission pathways that would result from current ambitions and plans, and a pathway that is consistent with a reasonable chance for limiting the rise in global average temperature to no more than 2°C above pre-industrial levels (Boyd et al., 2015). An important measure of success of the Paris Agreement is the fact that it recognized the gap in emission reductions and gave countries the ability to ameliorate their ambitions overtime. In this context, submitted INDCs became NDCs, accompanied by regular updates after every five years. In addition, there will be a periodic global stocktaking to assess collective evolution towards the objectives. The first stocktaking is slated for 2023, and every five years after. Countries are expected to consider the outcome of the evaluations to update and improve their national plans.

Throughout the cycle, countries need to work hard to narrow the emission gap, such as finding reliable ways of achieving higher emission reductions. In addition, countries will need to intensify efforts to increase investments and innovation in sectors that could help close the gap between intentions and the goal before and after 2030. One of such relevant sectors especially for countries in the tropics is the Agriculture, Forestry and Other Land Use (AFOLU) sector.

Globally, the AFOLU sector is responsible for about one quarter of anthropogenic GHG emissions. This implies mitigation from the sector is very important to meet emission targets (Bustamante et al., 2014). However, mitigation options in the sector are currently facing financial, institutional, technological barriers etc., (Smith et al., 2014). Policies governing practices in this sector need to account for both effective mitigation and adaptation. This can help to orientate practices in AFOLU towards global sharing of innovative technologies for effective land use (Bustamante et al., 2014). There is an opportunity to pursue mitigation and adaptation jointly through AFOLU during the implementation of NDCs.

The AFOLU sector is relevant for African countries to step up their future emission reduction determinations and the fight against climate change in general. In Africa, the AFOLU sector is a major source of emissions, thus relevant for mitigation options. The AFOLU sector needs to adapt to the impacts of climate change, and the ecosystem goods and services from the sector are important for enhancing the adaptive capacity of vulnerable peoples and for food security in the African continent. Furthermore, the AFOLU sector is a pillar for sustainable development and a driving force for the short and long-term economic emergence in many African countries.

Investments and innovations are relevant to make the AFOLU sector in Africa to contribute immensely to climate change mitigation and adaptation. In this perspective, a situational analysis of the relationship between the AFOLU sector and the NDCs of African countries in the context of future climate change response needs is appropriate to draw lessons that will

facilitate rapid decision making. The objective of this study is three-fold: firstly, to examine how AFOLU activities and contributions are represented in the NDCs of African countries; secondly, to understand the role of AFOLU in helping African countries to meet their intended contributions to fight climate change; and lastly, to assess the necessary conditions for a successful implementation of AFOLU activities within the NDC of African countries.

4.2 OVERVIEW OF AFOLU CATEGORIES

This study combines the voluntary carbon standards (VCS) AFOLU categories with those proposed by the AFOLU LEDS working group (Zeleke et al. 2016). Table 6 highlights the different categories used for this study to cover both mitigation and adaptation aspects of AFOLU.

Table 6: Different categories of AFOLU activities (modified from VCS and Zeleke et al 2016)

Category	Examples
Afforestation and reforestation (AR)	Agroforestry, tree planting, revegetation, drought-resistant forest species, national reforestation programs, assisted and natural regeneration
Agriculture management (AM)	crop, soil and livestock management activities, climate smart agriculture, conservation agriculture, use of adapted seed varieties, agricultural intensification, soil conservation
Forest management (FM)	Sustainable/improved forest management, fire management, ecosystem resilience activities, land management plans, reduced impact logging, certified logging (FLEGT, FSC), Community forest management
Deforestation and degradation avoidance (DD)	Activities to reduce deforestation and forest and land degradation by fighting desertification, better management of pastoralism, forest protection and conservation, management of protected areas and national parks, dune fixation
Bio-energy (BE)	Energy crops, solid waste, liquid waste, biogas, residues, improved firewood and charcoal stoves
Wetland restoration and conservation (WRC)	Protection and conservation of river basins, lakes, watersheds, coastal adaptation, mangrove conservation, coastal zone management

4.3 METHODOLOGICAL APPROACH

(i) Data Collection and Sample Size

Data for this study were drawn from the NDCs submitted by African countries to the UNFCCC secretariat in 2015 (UNFCC 2016). These countries are: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic (CAR), Chad, Comoros, Democratic Republic of Congo (DRC), Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Republic of Congo, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe. Out of the 54 African countries, 53 submitted their NDCs. Libya was the only country that did not elaborate and submit their NDC - probably due to political instability. While all the submitted NDCs were in either English or French language, the NDC of Equatorial Guinea was in Spanish, and was, therefore, excluded from this study. We finally analysed 52 NDCs.

In the months of February and March 2016, we accessed through the UNFCCC Secretariat website and read the NDCs with focus on AFOLU related intended contributions of the various African countries. To maximize the possibility of fully capturing relevant references and appearances linked to AFOLU contributions, we followed a number of steps. Firstly, we predefined six different categories of AFOLU activities as indicated in Table 1 above. They consist of afforestation, reforestation (AR); agricultural management (AM); forest management (FM); avoidance of deforestation and degradation (DD); bio-energy (BE); and wetland restoration and conservation (WRC). Secondly, we identified and analyzed references to the predefined AFOLU categories within the intended mitigation and adaptation contribution sections of the NDCs. Thirdly, we mapped out the different requirements and means of implementing AFOLU activities within the NDCs.

(ii) Data Analysis

We employ both hand-coded analysis and *Yoshikoder* as a software for quantitative content analysis of the NDC documents. *Yoshikoder* is an open-source computer-assisted software for performing quantitative content analysis (Lowe 2006). Another commonly used software for quantitative content analysis is the *Wordscores*. Both computer softwares were created as programmes for extracting policy positions in policy documents. While *Wordscores* can be performed using statistical programmes such as STATA, R, as graphical version written in Java (Klemmensen et al. 2007), it cannot produce good estimates compared to *Yoshikoder* (Chen 2011).

Using *Yoshikoder*, we pre-determined the AFOLU categories and patterns of word of interest, and then examined how these keywords distribute in the NDC documents. To be able to analyse the text using *Yoshikoder*, the formats of NDC documents were changed from MS Word and PDF to a text format. Keywords including forestry, agriculture, finance, capacity and technology were used to run the analysis. Each key word was further expanded to capture the full range of words that have the same or similar meaning. For example, to search for "agriculture" in the NDC documents, we employed other similar words such as: farm, crop, livestock, soil, etc. In some cases, we used truncated words in the search. In the case of "forestry" we used for example: forest* to represent or capture words such as forests, reforestation, afforestation, forestry, forest management, protection, conservation, sector, etc.

To make sure that the results from *Yoshikoder* are reliable, we conducted a hand-coded search for a few keywords and the results of the frequencies were similar. To further analyse the meanings associated with the use of keywords in the NDC documents, we made a concordance of the key words and obtained brief 5-word explanation for each key word in the NDC documents. In some cases, where relevant, we conducted one sample chi square test to see if there were differences between the observed and the expected frequencies or values of keywords.

4.4 RESULTS

4.4.1 Presentation of AFOLU in African NDCs

Our analysis (Figure 2) demonstrates major trends for the six pre-defined AFOLU category of activities in the NDC of African countries. In the adaptation contribution section of the NDCs, 80% (46 out of 52) of the countries referenced the AM AFOLU sector. While about 25% of the countries referenced the BE category in the AFOLU sector as a contributor to climate change adaptation. On mitigation, the A/R is referenced by 77% of the countries as the AFOLU category that contributes to mitigation. The BE category that is less referenced by countries in the adaptation section, is referenced as a major category in mitigation by 61% of the countries. The WRC category is referenced by only 10% of the countries as a contributor to climate change mitigation. There is limited progress in the African region on the role of coastal systems like mangrove forest systems in carbon storage.

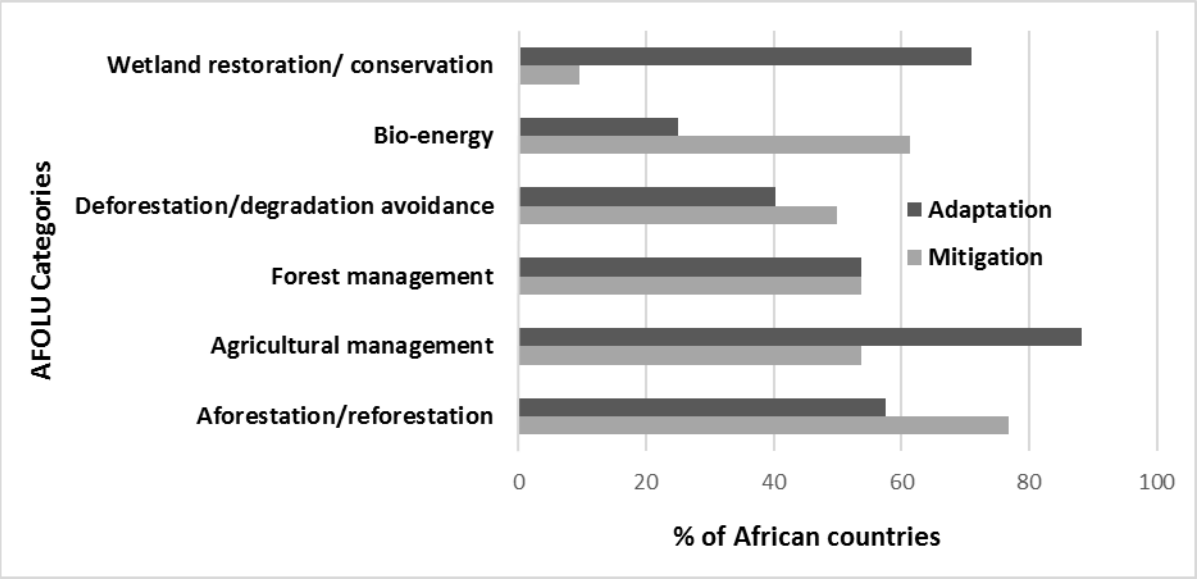
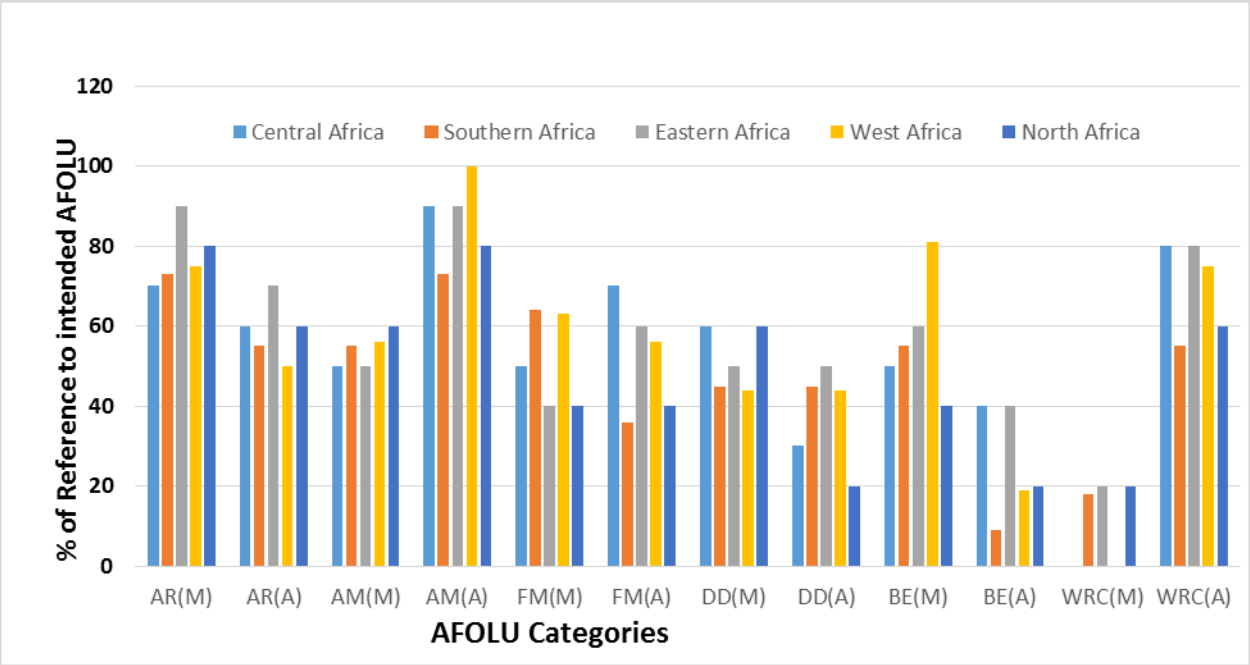


Figure 2: Reference to AFOLU activities in the NDC of 52 African countries analyzed.

We analyzed the intended AFOLU contributions by regions – Central Africa, Southern Africa, Eastern Africa, West Africa and North Africa (see Figure 3). This can provide preliminary grouping information which can help in building regional approaches to the implementation of NDCs, related to capacity building, technical know-how and the mobilization of financial resources. Regionally, the AR category is referenced above 50% by the NDCs of the countries in terms of its role in mitigation. This implies that AR activities are appealing to all the regions. Eastern African countries top the AR (M) chart with 90% of countries in the region referencing AR as a major activity for mitigation. Countries in Eastern Africa have made relative progress on the design and implementation of carbon sinks AR activities to generate carbon credits in both the voluntary and compliance markets. The WRC category was least referenced in the mitigation contribution section of the NDCs of the countries when grouped together according to regions.

In West Africa, BE category of activities appears to be important for mitigation. It is referenced by 81% of the NDCs of the countries in the region. AM activities of the AFOLU sector is referenced by 60% of countries grouped by regions, as important for climate change adaptation. West African countries scored the highest (100%) in terms of referencing agriculture management activities in their NDCs as important for adaptation.



A: Adaptation and M: Mitigation

Figure 3: AFOLU activities in the NDC of different regions of Africa (based on the analysis for 52 countries)

We also analyzed the NDCs of the 52 countries in terms of the contribution of the AFOLU sector in mitigation and adaptation according to forest types i.e. rainforest (n=13), dry forest (n=24) and Mediterranean forest (n=5) (Figure 4). The NDCs of 92% of dry forests countries mentioned AR activities as relevant for mitigation of climate change. This is followed by the NDCs of Mediterranean forests countries (80%). AM activities are mentioned by the NDCs of rainforest and dry forest countries (i.e. 92% each) as important for making contributions to climate change adaptation.

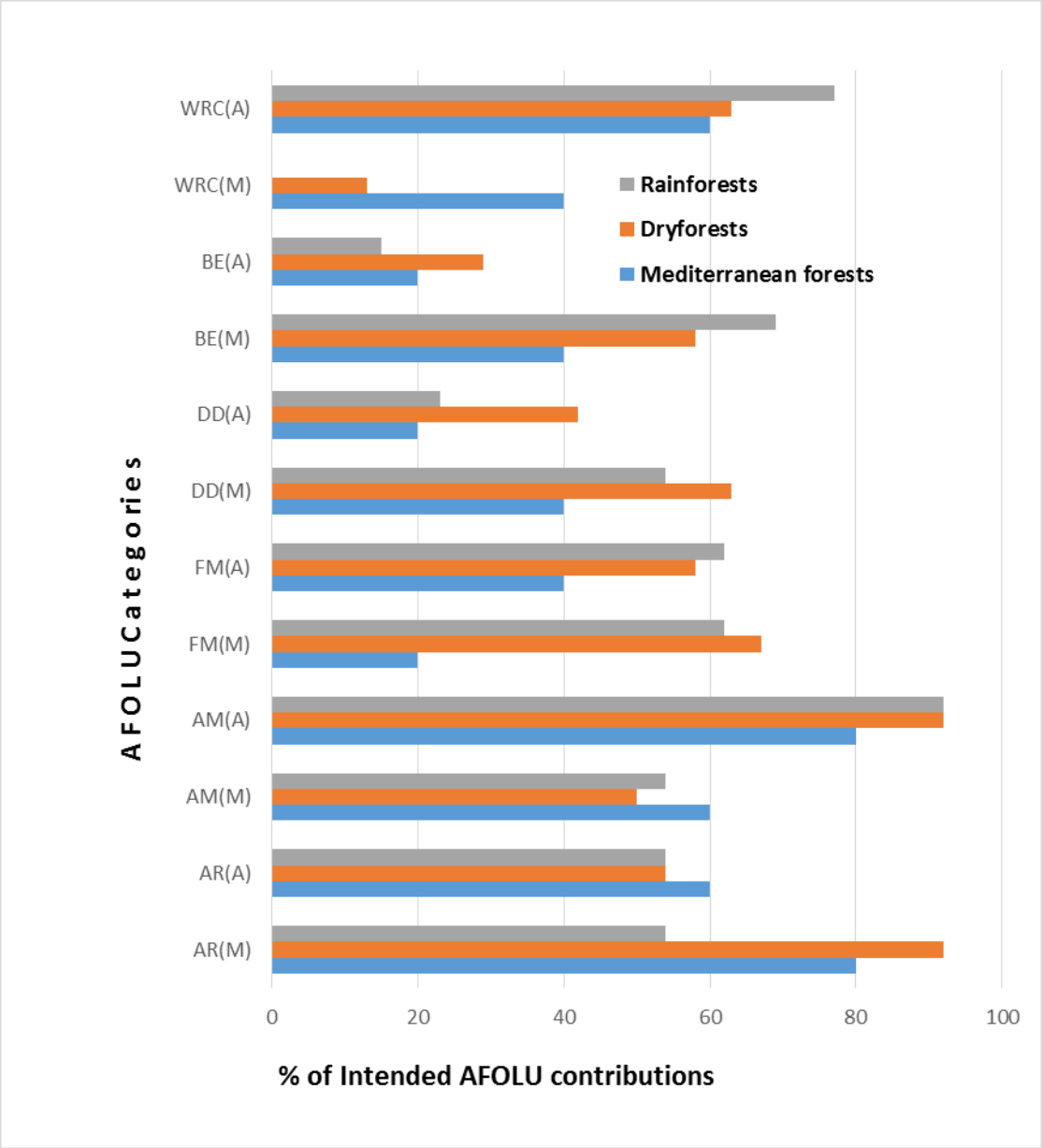


Figure 4: AFOLU activities in NDCs across different forest types in 52 African countries studied

4.4.2 Conditions and determinants for implementation of AFOLU activities

All Africa countries (100%) will meet their mitigation and adaptation commitments as indicated in their NDC on the conditions that they are provided with adequate means of implementation. The means of implementation here refers to capacity building, technological support and financial resources. However, 90% of these African countries are also prepared to use their own resources to implement some of the actions indicated in their NDCs. It should be noted that African countries are expecting about 70% of external support to be able to implement in full the activities in the NDCs. The countries stressed the need for the different implementation support in similar (**Error! Not a valid bookmark self-reference.**) and in different frequencies (**Error! Reference source not found.**).

Table 7: Request for means of implementation by African countries for the achievement of mitigation and adaptation targets

Means of Implementation	Frequency in Text	Reference to Mitigation		Reference to Adaptation	
		No of countries	%	No of countries	%
Capacity building	755	41	79	46	88
Transfer of technology	536	43	83	44	84
Finance	904	52	100	51	98

4.5 DISCUSSION

4.5.1. Mitigation and Adaptation are both Important for Africa

According to the submitted NDCs, the agriculture category of the AFOLU sector is important for climate change mitigation in Africa. Overall, agriculture is a major source for the three principal GHGs: CO_2, CH_4 and N_2O. Agriculture systems can also serve as carbon sinks through sequestration into biomass products and soil organic matter (Johnson et al., 2007). The current trends in agriculture expansion in poorer nations of the world drives land clearing and soil organic matter destruction. If this is to continue about 1 billion ha of land will be cleared globally by 2050, with CO_2-C equivalent GHG emissions reaching about 3 Gt y-1 (Tilman et al., 2011). According to Smith et al (2014), the size and regional distribution

of future mitigation potentials is difficult to estimate accurately because it depends on a number of inherently uncertain factors. Some of those factors include population growth, and economic and technological development. Countries south of the Sahara constitute a greater proportion of the poorer countries of the world. Thus agriculture improvement measures are relevant to minimize GHG emissions. This is demonstrated by the different practices African countries have put forward to improve both crop and animal agriculture practices as a contribution to limit global GHGs emission.

Africa has great potentials to contribute to global climate change mitigation through forest carbon emission reduction activities. Africa has vast degraded lands which are suitable for the development of forest carbon sinks through afforestation and reforestation (Jindal et al., 2008, Unruh, 2008). Due to a mix of socio-political, financial and technical factors, Africa is yet to benefit from the global approach of incentivizing and motivating the creation of carbon sinks through the Kyoto Protocol Compliance markets (Jindal et al., 2008). Notwithstanding, relative progress has been made in the region especially in Eastern Africa (Uganda and Kenya) to develop and implement AR activities (Cisneros, 2012).

Deforestation and forest degradation is a major source of carbon emissions in Africa and in other developing countries. There is a need to reverse the trends in the rate of deforestation and forest degradation. The most important driver of deforestation is commercial agriculture, followed by subsistence agriculture. Degradation is mostly driven by timber exploitation, followed by fuelwood collection and charcoal production, uncontrolled fire and livestock grazing (Noriko et al., 2012). The Paris Agreement underscored the importance of forests as sinks and sources of GHG emissions. REDD+ is one of the approaches to respond to this call jointly agreed by all the 195 members of the UNFCCC. If well designed and implemented, the REDD+ approach will not only help Africa participate in achieving the global climate change mitigation objective, but will also lead to the non-carbon benefits that will result from contributions to climate change adaptation. However, some argue that linking REDD+ and NDCs should be treated with care, because overlapping REDD+ into NDCs may undermine and undercut the fundamental principles of REDD+ as a mechanism that rewards countries for keeping their trees standing (Fobissie and Nkem, 2015).

Bio-energy is mentioned in the African NDCs as one of the AFOLU categories that can make African countries contribute to global ambitions to mitigate climate change. Generally, bioenergy has a major role to play in climate change mitigation, but there are concerns to consider such as the sustainability of practices and the efficiency of bioenergy systems (Smith et al., 2104). Africa is spatially suitable for hosting the production of bioenergy crops. However, on large-scale serious threats may arise in relation to food security, water resources conservation, biodiversity conservation and livelihoods. It should be noted that the role of bioenergy crops in GHG emission is still under debate related to land use competition effects, despite increasing number of bioenergy crop plantations in the different regions of Africa. In sub-Saharan Africa, energy consumption is comprised of 80% biomass

(Zulu and Richardson, 2013). Thus, the biomass sector provides an important opportunity for climate change mitigation in Africa. Examples of mitigation actions may include improved charcoal and fuelwood stoves and small-scale biogas production (Hofstad et al., 2009).

Adaptation of agriculture systems to climate change is a concern and a priority for many African countries, as indicated by the findings from their NDCs. In many parts of Africa the impacts of climate change i.e. increasing temperature and changes in precipitation, are expected to be unfavorable for crop and livestock production. There is emerging evidence that high-value perennial crops could also be adversely affected by temperature rise, in addition to increased pressure on crops from pests, weeds and diseases (Field et al., 2014). Generally, warming and drying may reduce crop yields by 10-20% in the long-term, though losses in some places are probably likely to be more severe (Jones and Thornton, 2009). This is coupled with the fact that rain-fed agriculture is the dominant source of staple food production and livelihood base of the bulk of the rural poor in Africa (Cooper et al., 2008). In the short-term changes are also expected. For example, there will be changes in the frequency and harshness of extreme climate events and this will have significant consequences for food production, food security and livelihoods. Increasing frequencies of heat stress, drought and flooding events are likely and these will undoubtedly have adverse effects on crop and livestock productivity (Parry, 2007). In this light, there is an urgent need to accelerate investments through innovations that have high chances of succeeding economically and of being adopted with solid impacts, even above and beyond that requested by African countries in their NDCs.

Climate change will exert significant effect on forest ecosystems and their provision of ecosystem goods and services which form safety nets for millions of rural poor in Africa (Somorin, 2010). Building adaptation strategies is imperative for forest-dependent households and communities, and countries whose economies depend on forest and forest related sectors. Climate change can have effects on the mitigation potentials of forests. Rising temperatures, droughts, fires, insect and disease outbreaks exacerbated by climate change and climate extremes may lead to forests becoming a weaker sink for carbon, thereby putting the mitigation potential of forests at risk (Smith et al., 2014). Designing and implementing forest management strategies for the adaptation of forests is important to keep carbon in trees and to increase the sequestration potentials of forests and trees.

Adaptation of coastal, wetlands and ocean systems is pertinent for African countries. These systems contribute to the economies and livelihoods of African countries. Coastal systems will experience impacts through sea level rise and storm spells. Coral reefs and coastal upwelling that are important for fisheries in Africa will be affected by climate change through ocean acidification and sea surface temperature rise (Field et al., 2014). On the mitigation side, there is growing evidence that mangrove forest systems can contribute to the mitigation of climate change through their capacity to provide ecosystem services, including carbon storage (Nam et al., 2015, Bhomia et al., 2016). This is a reason for African

countries with coastal or mangrove forests systems to support conservation and restoration in order to benefit from carbon offset payments under approved climate change mitigation strategies and actions.

4.5.2. Synergetic Adaptation and Mitigation Outcomes in AFOLU Activities

The synergy between M & A in AFOLU is about implementing activities in a way that they deliver simultaneous positive outcomes for M & A. The AFOLU sector in Africa is faced by two important challenges. Firstly, the sector which is vulnerable to climate change is responsible for food security, poverty alleviation and development in Africa. Secondly, AFOLU is a critical component in Africa's contribution to the global climate change solution. This is an indication that both mitigation and adaptation are priorities for Africa. Activities in the AFOLU sector are designed and implemented independently or in combination in landscapes to respond to adaptation or mitigation. In the emerging literature on M & A synergy, it is argued that due to the overlap between mitigation and adaptation measures, where interventions can have both mitigation and adaptation benefits, implementing them in an integrated manner will be more efficient and effective (Dang et al., 2003, Matocha et al., 2012). The analysis of the NDCs indicates that many African countries are aware of the linkages between mitigation and adaptation where they noted that mitigation can produce co-benefits for adaptation and vice-versa.

M & A synergy outcomes are only a part of the expectations from landscapes, which are faced with other demanding functions such as food security, poverty reduction, energy, biodiversity conservation etc. In this context, synergy in the case of the AFOLU sector should be looked at from a landscape system approach where M & A are considered as part of a broader number of multiple landscape functions, which are delivered by a set of practices (Duguma et al., 2014). Some African countries in their NDCs mentioned, though not substantially, the implementation of activities in integrated ways at the landscape level.

The "Climate smart-landscapes" approach provides opportunities to enhance the integrated method to synergy. Through this approach, important synergies for agriculture production, climate M & A as well as other livelihood and environmental benefits can be generated, through coordinated actions at farm and landscape scales. However, a number of institutional instruments are required to enhance this approach, such as multi-stakeholder or multi-sector planning, supportive governance and tenure, spatial targeting of investments and a strong system to monitor social and ecological changes at the different levels. More than that, putting these instruments into place will require a higher level political, institutional and technical support (Scherr et al., 2012).

African countries in their NDCs stressed the need to have financial, capacity building and technological support to carry out full scale implementation of activities in the NDCs. However, it should be noted that the availability of these resources for implementation is not enough. They should be accompanied by an enabling environment from the local, national and global levels to facilitate the efficient and effective use of these resources in order to achieve the desired outcomes for M & A. Furthermore, sufficient detail, clear and transparent financial, technological and capacity building needs should be included in the NDCs, when countries are doing revision or updating. This will help to build the public-private partnerships that African countries are hoping to use to mobilise the required resources for NDC implementation.

4.5.3. Prospects for Regionally Designed NDC Interventions

Ecologically and in terms of geography, it is easy for countries in a region to perceive a clear picture of a regional approach to design NDC interventions. However, in terms of strategy and means of implementation of the interventions, caution needs to be applied. This is because countries in a region may have the same geographical setting to respond to climate change, but may possess different circumstances and priorities at the national level. Countries possess different levels of economic and technological development and different poverty levels. Countries may also have different ways of effecting behavioral change, which is influenced by cultural and normative backgrounds, market structures and incentives, and how all these translate into the demand for food, fiber, fodder and fuel as well as development in agriculture, fisheries and forestry sectors. Other factors that may also lead to differentiation include climate change impacts on agriculture and other natural systems and adaptive capacity (Smith et al., 2014) though the geographical region may experience the same type of climate change impacts. For example in West Africa and the Sahel, the countries in this region may have different levels of resources to define adaptation interventions.

Experience from ongoing global mechanisms and processes on M & A, shows that regional links are required and should be created in some aspects; for example, in promoting regional efforts to pool resources, knowledge and skills on technical aspects of NDC interventions related to AFOLU.

4.6 CONCLUSIONS AND RECOMMENDATIONS

This paper has examined the AFOLU sector in the NDCs of almost all (52 of 54) African countries, in the context of activities, roles and implementation challenges and opportunities. The AFOLU sector intervention and activities are well represented in the adaptation and mitigation strategies as communicated by the NDCs. The AFOLU sector is a key contributor to GHG emissions in Africa. The sector is already experiencing the impacts of climate change throughout the different regions of the continent. Furthermore, the sector is relevant for food security, poverty alleviation and national development for many countries in the continent. The NDCs analyzed here clearly stress the need for financial support, technology transfer and capacity building assistance in order to implement and meet all or part of their intended contributions. Detailed information about the financial, technology and capacity building needs are absent in many of the NDCs. The flow of resources for implementation is important but not sufficient. Enabling environment is necessary to facilitate the efficient use of resources. In order for the AFOLU sector in Africa to reach its full mitigation potentials that will contribute to any successful climate change response ambition, there is need to look for ways to strengthen and improve the performance of the AFOLU sector. The following should be taken into consideration:

- There is significant overlap observed between M & A interventions in the NDCs of African countries in relation to the AFOLU sector. This is an important opportunity for African countries to re-organize M & A processes in their respective strategies and policy frameworks for synergy outcomes. For example, in the adaptation strategies and plans priority should be given to adaptation activities that exhibit the potentials to deliver mitigation benefits, and vice-versa.

- Climate change M & A is only part of the multiple expectations from the AFOLU sector in Africa. The Climate-Smart Landscape approach provides an opportunity for AFOLU to respond to M & A and also support other functions like food security, poverty alleviation, biodiversity conservation, and energy.

- The Landscape approach scenarios in Africa show complex relationships between the AFOLU sub-sectors. This condition requires high level political, institutional and technical support to facilitate and support coordination, multi-stakeholder planning, governance arrangements and investment flows.

- African countries should be cautious when making request for financial support in future NDCs revisions and updates. Today, mitigation finance falls short of what is needed to deliver ambitious targets through the AFOLU sector interventions. There are no clear signals at the international levels on how funds will be generated, distributed and sustained to support the implementation of NDCs, especially for developing countries.

- In many African countries, complex political economy situations drive competition between sectoral policies and interests. This calls for transformational change to achieve any meaningful emission reductions from the AFOLU sector. Governments, following their national contribution pledges should be able to initiate and facilitate transformational change i.e. changing from the "business as usual" conditions through changes in economic interests and power relations.
- Climate change action is urgent for all the sub-sectors of the AFOLU group of sectors in Africa. To achieve results in an efficient and effective manner, it is important to break the sectoral barriers between agriculture and forestry through a holistic and cross-cutting approach when fixing emission reduction targets.

REFERENCES

Bhomia, R., Mackenzie, R., Murdiyarso, D., Sasmito, S. & Purbopuspito, J. 2016. Impacts of Land Use on Indian Mangrove Forest Carbon Stocks: Implications for Conservation and Management. Ecological Applications.

Boyd, R., Turner, J. & Ward, B. 2015. Intended nationally determined contributions: what are the implications for greenhouse gas emissions in 2030?

Bustamante, M., Robledo-Abad, C., Harper, R., Mbow, C., Ravindranat, N. H., Sperling, F., Haberl, H., Siqueira Pinto, A. & Smith, P. 2014. Co-benefits, trade-offs, barriers and policies for greenhouse gas mitigation in the agriculture, forestry and other land use (AFOLU) sector. Global change biology, 20, 3270-3290.

Chen, YW 2011. Quantitative content analysis of Chinese texts. A methodological note. Journal of Chinese Political Science 16:431-443.

Cooper, P., Dimes, J., Rao, K., Shapiro, B., Shiferaw, B. & Twomlow, S. 2008. Coping better with current climatic variability in the rain-fed farming systems of sub-Saharan Africa: An essential first step in adapting to future climate change? Agriculture, Ecosystems & Environment, 126, 24-35.

Dang, H. H., Michaelowa, A. & Tuan, D. D. 2003. Synergy of adaptation and mitigation strategies in the context of sustainable development: the case of Vietnam. Climate policy, 3, S81-S96.

Duguma, L. A., Minang, P. A. & Van Noordwijk, M. 2014. Climate change mitigation and adaptation in the land use sector: from complementarity to synergy. Environmental management, 54, 420-432.

Field, C. B., Barros, V. R., Mach, K. & Mastrandrea, M. 2014. Climate change 2014: impacts, adaptation, and vulnerability, Cambridge University Press Cambridge, New York, NY.

Fobissie K. & Nkem, J. 2015. The interface of REDD+ and INDCs in the new climate agreement. The interface of REDD+ and INDCs in the new climate agreement: Implications for Africa.

Hofstad, O., Köhlin, G. & Namaalwa, J. 2009. How can emissions from woodfuel be reduced. Realising REDD, 237.

Jindal, R., Swallow, B. & Kerr, J. 2008. Forestry-based carbon sequestration projects in Africa: Potential benefits and challenges. Natural Resources Forum, 32, 116-130.

Johnson, J. M. F., Franzluebbers, A. J., Weyers, S. L. & Reicosky, D. C. 2007. Agricultural opportunities to mitigate greenhouse gas emissions. Environmental Pollution, 150, 107-124.

Jones, P. G. & Thornton, P. K. 2009. Croppers to livestock keepers: livelihood transitions to 2050 in Africa due to climate change. Environmental Science & Policy, 12, 427-437.

Klemmensen, R. Hobolt, SB. And Hansen ME 2007. Estimating policy positions using political texts: An evaluation of the wordscores approach. Electoral Studies 26(4): 746-755.

Lowe, W. 2006. Yoshikoder: An open source multilingual content analysis tool for social scientists. Paper presented at the American Political Science Association (APSA) conference 2006. 2 September 2006. Philadelphia, USA.

Matocha, J., Schroth, G., Hills, T. & Hole, D. 2012. Integrating climate change adaptation and mitigation through agroforestry and ecosystem conservation. Agroforestry-The Future of Global Land Use. Springer.

Murdiyarso, D., Brockhaus, M., Sunderlin, W. D. & Verchot, L. 2012. Some lessons learned from the first generation of REDD+ activities. Current Opinion in Environmental Sustainability, 4, 678-685.

Nam, V. N., Sasmito, S. D., Murdiyarso, D., Purbopuspito, J. & Mackenzie, R. A. 2015. Carbon stocks in artificially and naturally regenerated mangrove ecosystems in the Mekong Delta. Wetlands Ecology and Management, 1-14.

Noriko, H., Martin, H., Veronique De, S., Ruth, S. D. F., Maria, B., Louis, V., Arild, A. & Erika, R. 2012. An assessment of deforestation and forest degradation drivers in developing countries. Environmental Research Letters, 7, 044009.

Parry, M. L. 2007. Climate change 2007-impacts, adaptation and vulnerability: Working group II contribution to the fourth assessment report of the IPCC, Cambridge University Press.

Scherr, S. J., Shames, S. & Friedman, R. 2012. From climate-smart agriculture to climate-smart landscapes. Agriculture & Food Security, 1, 1-15.

Smith, P., Bustamante, M., Ahammad, H., Clark, H., Dong, H., Elsiddig, E. A., Haberl, H., Harper, R., House, J. & Jafari, M. 2014. Agriculture, forestry and other land use (AFOLU). Climate change 2014: mitigation of climate change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

Somorin, O. A. 2010. Climate impacts, forest-dependent rural livelihoods and adaptation strategies in Africa: A review. African Journal of Environmental Science and Technology, 4, 903-912.

Tilman, D., Balzer, C., Hill, J. & Befort, B. L. 2011. Global food demand and the sustainable intensification of agriculture. Proceedings of the National Academy of Sciences, 108, 20260-20264.

UNFCCC 2016. Intended Nationally Determined Contributions (INDC) as communicated by Parties. Accessed online February -March 2016 http://unfccc.int/focus/indc_portal/items/8766.php

Unruh, J. D. 2008. Carbon sequestration in Africa: The land tenure problem. Global Environmental Change, 18, 700-707.

Zulu, L. C. & Richardson, R. B. 2013. Charcoal, livelihoods, and poverty reduction: Evidence from sub-Saharan Africa. Energy for Sustainable Development, 17, 127-137.

Zeleke, A. Phung, T. O'Sullivan, R. Lawry, S. Gnych, S. 2016. Role of Agriculture, Forestry and Other Land Use Mitigation in INDCs and National Policy in Asia. USAID, Winrock International.

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