A PLATFORM FOR STAKEHOLDERS IN AFRICAN FORESTRY

NATIONAL AND SUB-NATIONAL REDD+ ACTIVITIES IMPLEMENTED IN MANGROVES IN WEST AND CENTRAL AFRICA

AFRICAN FOREST FORUM WORKING PAPER SERIES

VOLUME 2

ISSUE 19, 2014

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Correct citation: Popoola L. 2014. National and sub-national REDD+ activities implemented in mangroves in West and Central Africa. African Forest Forum, Working Paper Series, Vol. 2(19), 31 pp.

Cover photo: African Forest Forum

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National and sub-national REDD+ activities implemented in mangroves in West and Central Africa

Popoola L.

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Acronyms and Abbreviations

ACOPRIK	Community Action for the Primates of Kasai
ADAPEL	Action pour le Developpement de l'Agriculture et de la Peche avec Protection Environnementale de Likende
AFD	Agence Française de Développement
AFF-CCP	African Forest Forum Climate Change Programme
APRM	African Peer Review Mechanism
CBFF	The Congo Basin Forest Fund (CBFF)
BCI	Bonobo Conservation Initiative
CACO-REDD+	Cadre de Concertation des Organisations de la Société Civile Congolaise et des Peuples Autochtones sur la REDD+
CED	Committee for Economic Development
CFAD	Caring from a distance
CI	Conservation International
CNN	Cable News Network
COMIFAC	Commission des Forêts d'Afrique Centrale
CONA-REDD	National REDD+ Committee
COP	Convention of Parties
CREMAs	Community Resource Management Areas
DFID	Department for International Development
DRC	Democratic Republic of Congo
FAO	Food and Agricultural Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FFI	Fauna and Flora International
FLEGT	Forest Law, Enforcement, Governance and Trade

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GHG	Green house gas
GEF	Global Environmental Fund
ICCN	Institut Congolais pour la Conservation de la Nature
IUCN	International Union for the Conservation of Nature
JICA	Japanese International Cooperation Agency
LGA	Local Government Area
LPAC	Local Project Appraisal Committee
MDDEFE	Ministère du Développement Durable, de l'Economie Forestière et de l'Environnement
MDDEFE	Ministry of Sustainable Development, Forest Economy and Environment
MINEP	Ministry of Environment and Protection of Nature
MINFOF	Ministère des Forets et de la Faune Cameroun
MLNR	Ministry of Land and Natural Resources
MRV	Monitoring, Reporting and Verification
NAPA	National Adaptation Programme of Action
NESDA-CA	Network For Environment and Sustainable Development
NGO	Non-governmental Organization
NREG	Natural Resources and Environmental Governance Development Policy Operation
NRSC	National REDD+ Steering Committee
POA	Programme of Action
REDD	Reduce Emission from Deforestation and Forest Degradation
REDO	Resource & Environment Development Organisation
R-PIN	Readiness Preparation Idea Note
R-PP	Readiness Preparation Proposal

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SADC	Southern African Development Community
TC	Technical Coordination
TOR	Term of Reference
UCLA	University of California, Los Angeles
UN	United Nations
UNCLOS	United Nations Convention on Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programmes
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations REDD programme
VPA	Voluntary Partnership Agreement
WCMC	World Conservation Monitoring Centre
WRI	World Resources Institute
WWF	Worldwide Wildlife Fund

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Executive Summary

With the decision on the Reduction of Emissions from Deforestation and forest Degradation (REDD+) in COP-16 in Cancun, the contribution of forests to climate change has been recognized as a cornerstone of the post-2012 climate change agenda. REDD+ includes policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries, and recognizes the contribution of conservation, sustainable management of forests and enhancement of forest carbon stocks in achieving REDD+ objectives. The mangroves, with their unique characteristics hold some potential for realizing the aims of REDD+.

This study involved literature work on the extent and prevalence of the mangroves in West and Central Africa, to be able to determine their present status, ownerships, local uses and national policies governing them. This served as the basis for the assessment and analysis of implementation of REDD+ in the sub-regions. Online sources and interviews of key informants were employed for data gathering on people's perceptions of the mangrove forests, the uses to which they are put, their contributions to livelihoods and anthropogenic factors affecting their sustainable management. Data and information germane to REDD+ in the countries, where mangrove forests exist, were sourced on such issues as Policy, Methodologies, Finance and Adaptation to, and Mitigation of climate Change impacts. Extant national forest policies in relation to ownership, use and conservation of the mangroves were analyzed to know how they impact climate change, and in particular, REDD+ schemes, with a view to up-scaling proven best options.

Mangroves occur in 19 West and Central African countries, from Mauritania (West Africa) in the north with the southernmost stands in Angola (Central Africa). Nigeria contains the most extensive mangrove ecosystems, which comprise nearly 35% of the total cover for West and Central Africa. Mangrove covers in West and Central Africa are together about 11% of the global mangrove forests. All the 19 countries are very rich in floral and faunal mangrove species. Regional conditions enable mangroves to grow as far as 100 km inland, due to strong tidal influences on rivers such as the River Gambia, the Sine-Saloum in Senegal, the Casamance, Guinea Bissau, River Niger and Cameroonian rivers (Sanaga, Wouri). Similarly, where there are strong riverine influences into the seas, islands affected by freshwater influxes provide an environment for mangrove growth. The overall trend for the sub-regions indicates a moderate decline of mangrove cover. Four countries (Benin, Togo, Guinea-Bissau and Mauritania) appear to have an increase in mangrove area; two (Gambia and Equatorial Guinea), a slight decline; nine countries (The Republic of Guinea, Sierra Leone, Liberia, Ghana, Nigeria, Cameroon, Angola, São Tomé and Príncipe) moderate decline and three countries (Congo, Côte d'Ivoire and Democratic Republic of the Congo) show a severe decline in mangrove habitats. Some of the observed threats to mangroves in

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these countries were rapid population growth in the coastal zones; oil prospecting and exploitation; communal and political conflicts; climate change; farming; mining, hunting; fishing; industrial and urban development and over-exploitation of mangrove resources. However, there are renewed efforts for mangrove and community restorations in a number of countries in the two sub-regions.

Some of the countries in the two sub-regions are currently implementing REDD+ with funding from external sources. They have also established institutions with responsibility for REDD+ working concurrently with various forest sector, institutional and governance reform efforts. Others have demonstrated interest in REDD+ by engaging in some other activities that are REDD+ compliant. Though there are very few mangrove-specific REDD+ initiatives in both sub-regions, there appears to be a great potential in that direction, considering the uniqueness of the mangroves. For this to be realized, identified political, institutional, technical, socio-economic and cultural, as well as resources and funding challenges need to be urgently addressed. There is also the need for pilot studies on REDD+ possibilities in the mangroves of the sub-regions. The sub-regions will need to embark on urgent reforms that will enhance financial, technical, including research and administrative capacities that will ensure the realization of the full advantages of the mangroves in the scheme.

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CHAPTER 1 Introduction

Mangroves are salt-tolerant characteristically complex plant communities, occurring in sheltered coastline areas in the tropical and sub-tropical intertidal regions of the world such as bays, estuaries, lagoons and creeks. The plant community of a mangrove swamp is most commonly termed mangal, a forest with a dense canopy, also known as mangrove swamp forest or, simply, mangrove (Omogoriola et al., 2012). They are unique plant communities that have evolved to survive in the interface between land and ocean in the humid climate of the tropics and subtropics. They are variously described as coastal woodland, tidal forest and mangrove forest and grow as trees up to 40m high or as shrubs below the high-water level of spring tides. They have evolved intricate mechanisms to enable them to cope with the high concentrations of salt and regular inundation of their root systems by incoming tides (UNEP, 2007).

Historically, mangroves have been regarded as swampy, mosquito-infested, muddy wastelands and have, in the past, been cleared in the interest of public health (AFROL, 2002) or for conversion into other uses for high profit but short-term gains. It has emerged that mangroves are among the most productive terrestrial ecosystems and are a natural, renewable resource (NOAA/NOS, 2002; FAO, 2005). Throughout West and Central Africa, the livelihoods of coastal populations depend heavily on access to natural resources. Mangroves fulfil important functions in terms of providing wood and non-wood forest products, coastal protection, conservation of biological diversity, habitat for wildlife, spawning grounds and nutrients for a variety of fish and shellfish, and site for salt production (UNEP, 2007). The need therefore arises for the connections between mangroves and livelihoods throughout Africa to be strengthened at the policy level. With high coastal populations, rapid urban growth and a high dependency of coastal populations on fish for protein, fuel, timber and rice production, pressures on mangroves are high (FAO, 2005; UNEP, 2007). There is concern that the long-term values of intact and functioning ecosystems are not being recognized in current policy decisions, where short-term gain resulting in loss of the ecosystem is being pursued at the expense of long-term sustainability. In 1994, the World Bank predicted that 70% of the mangroves in Africa would be deforested if no action was taken (World Bank, 1994). This is already happening as large chunks of mangroves are now being exploited in many West and Central African countries for short-term gains.

The contribution of forests to climate change has been recognized as a cornerstone of the post-2012 climate change agenda with the decision on the Reduction of Emissions from Deforestation and forest Degradation (REDD+) in COP-16 in Cancun. It includes policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries and recognizes the

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contribution of conservation, sustainable management of forests and enhancement of forest carbon stocks in achieving REDD+ objectives. Developing appropriate adaptation and mitigation actions includes the improvement of forest management to reduce vulnerability and to mitigate GHG through REDD+.

Literature on extent and prevalence was sourced and analyzed to be able to determine the present status, ownerships, local uses and national policies governing mangroves in West and Central Africa. This served as the basis for the assessment of implementation of REDD+ in mangrove in the sub-regions. The study relied largely on online sources for the data used. Interviews by emails were conducted on key informants on people's perceptions of the forests, the uses to which they are put, their contributions to livelihoods and anthropogenic factors affecting their sustainable management. Data and information germane to REDD+ in the countries, where mangrove forests exist, were sourced on such issues as Policy, Methodologies, Finance, Adaptation to climate change, Mitigation of climate change. Extant national forest policies in relation to ownership, use and conservation of the mangroves were analyzed to know how they impact climate change, and in particular, REDD+ schemes with a view to up-scaling proven best options. A limitation of this study is the fact that REDD/REDD+ activities have not yet taken root in the mangroves of the study area. However, successful REDD/REDD+ activities in other forest formations were studied as indicative of the potentials of mangroves in the scheme. According to the UNFCCC (2009a), REDD+ represents policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries. It states further, that REDD+ has evolved as a concept, and means different things to different countries, organizations and individuals. The concept is hinged on three types of changes: *deforestation* means forest area is reduced, *degradation* means carbon density is reduced and *regeneration* and *rehabilitation* means carbon density is increased. Though afforestation/reforestation was not originally part of REDD+, enlarging or increasing the area of forest through afforestation, reforestation (A/R) and conservation of forests has the potential to increase carbon stocks. Therefore, A/R being part of the Clean Development Mechanism (CDM) makes it relevant in the long term goal of REDD+. At the moment, there is a complete absence of REDD+ activities in the mangroves in the West and Central African sub-regions.

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CHAPTER 2 Status of Mangroves in West and Central Africa

According to UNEP (2007), mangroves occur in 19 West and Central African countries (Fig. 1), from Mauritania (West Africa) in the north with the southernmost stands in Angola (Central Africa). The term mangrove is said to derive from the word mangue, which comes from Senegal, Gambia and Guinea (Vannucci, 1989). Characteristically, mangroves are found growing along ocean shores and along creeks/riverine shorelines, but they may extend up to 100 km inland. Nigeria, with its extensive shoreline contains the most extensive mangrove ecosystem, which comprises nearly 35% of the total mangrove cover for West and Central Africa (UNEP-WCMC, 2006). Mangrove cover in West and Central Africa together is about 11% of the global mangrove forests. Table 1 presents the mangrove distribution, total mangrove area and percentage estimates of the regional coverage.

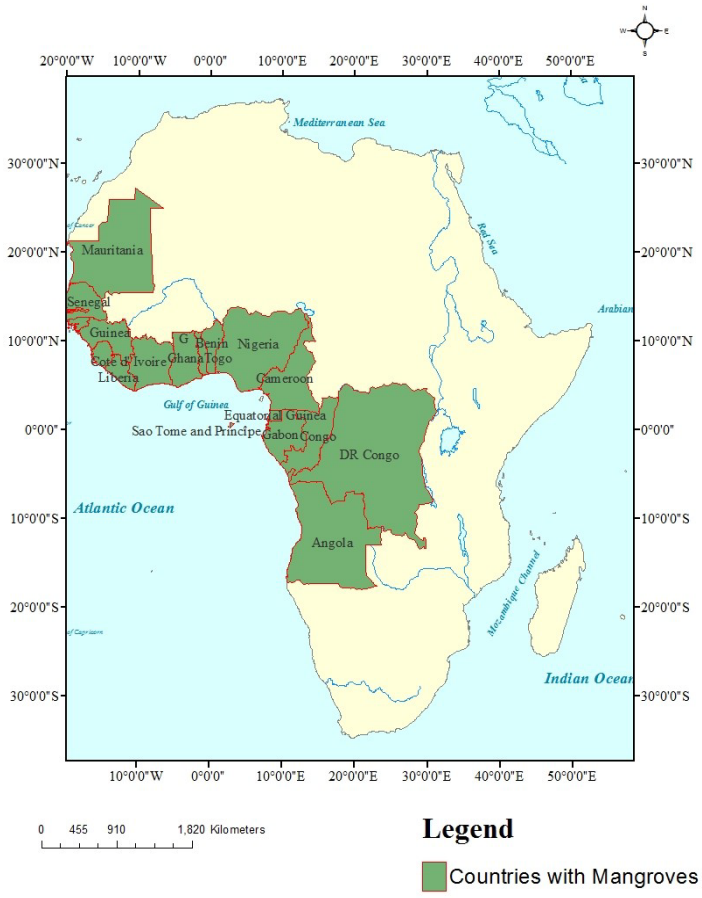

Figure 1. Map of Africa showing Countries with Mangroves in West and Central Africa

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Table 1. Mangrove distribution in West and Central Africa: number of species, area and percentage estimates of national coverage (UNEP-WCMC, 2006b and others)

Country	No. of Mangrove Species	Mangrove area (Km^2)	Coastline (km)	% of regional coverage
Benin	6	66	152.7	0.33
Cote d'Ivoire	5	99	797.3	0.49
Gambia	7	581	502.7	2.88
Ghana	6	139	757.8	0.69
Guinea	7	2039	1614.5	10.12
Guinea Bissau	6	2999	3176	14.89
Liberia	6	110	842	0.55
Mauritania	3	2.09	1268.4	0.01
Nigeria	8	7386	3121.9	36.67
Senegal	7	1287	1327.2	6.39
Sierra Leone	6	1052	1677.1	5.22
Togo	3	11	52.7	0.05
Angola	3	333	2251.8	1.65
Cameroon	6	1957	1798.7	9.71
Congo	6	17	205.1	0.08
Congo DR	6	201	176.8	0.99
Equatorial Guinea	2	258	602.6	1.28
Gabon	7	1606	2019.1	7.97
Sao Tome Principe	4	1.4	269	0.007
Total		20144.49	22613.4	100

MANGROVE BIODIVERSITY IN WEST AND CENTRAL AFRICAN COUNTRIES

UNEP (2007), quoting Tomlinson (1986) lists the eight true mangrove species found in West and Central Africa as including *Acrostichum aureum*, *Avicennia germinans*, *Conocarpus erectus*, *Laguncularia racemosa*, Nypa fruticans, *Rhizophora harrisonii*, *Rhizophora mangle*, *Rhizophora racemosa*. The distribution of these species by country is shown in Table 2.

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Table 2. Distribution of Mangrove species across West and Central African countries (Source: UNEP, 2007)

Country	Mangrove species							
	Acrostichum aureum	*Avicennia germinans*	*Conocarpus erectus*	*Laguncularia racemosa*	*Nypa fruticans*	*Rhizophora harrisonii*	*Rhizophora mangle*	*Rhizophora racemosa*
Benin	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Côte d'Ivoire	Yes	Yes	Yes	Yes	No	No	No	Yes
Gambia	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Ghana	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Guinea	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Guinea Bissau	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Liberia	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Mauritania	No	Yes	Yes	No	No	No	No	Yes
Nigeria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Senegal	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Sierra Leone	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Togo	No	Yes	Yes	No	No	No	No	Yes
Angola	No	Yes	No	No	No	No	Yes	Yes
Cameroon	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Congo	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Congo DR	Yes	Yes	No	Yes	No	No	Yes	Yes
Equatorial Guinea	No	Yes	Yes	No	No	No	No	Yes
Gabon	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Sao Tome & Principe	Yes	Yes	Yes	Yes	No	Yes	No	

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MAIN USES OF MANGROVES AND ASSOCIATED ECONOMIC ACTIVITIES IN WEST AND CENTRAL AFRICA

Mangrove swamps are among the most diverse and active ecosystems on earth. They are a barrier between the land and sea, serving as nurseries of the ocean, where many species of fish and shrimps breed and their young thrive; birds roost, rodents seek out prey, and primates scavenge in them. They are also a buffer against coastal erosion in a region where much of the population lives in low-lying areas. Aquaculture, Ecotourism, Fisheries, Hunting and harvesting are important activities in the mangroves; however, aquaculture is not particularly developed in West and Central Africa. There is evidence of ecotourism in West Africa. In particular, Senegal (Petit Côte, Siné-Saloum) and Gambia have been targeted for their potential (Said, 2007). More than five million people in the sub-regions are dependent on small-scale fisheries for their livelihoods. In addition to capture fisheries, “Acadja” or the brush park system is also practised in West African lagoon systems. This is a traditional method of fishing that involves setting up artificial habitats in the middle of lagoons using tree branches (frequently mangroves) (UNEP, 2007).

Mangroves are also used for a number of medicinal purposes. Non-use values of mangroves in the region include rich cultural and spiritual values. They provide environments for many rare and endangered species such as the African manatee, and are nurseries for many fish species. Oil exploration and production take place in the region. More than 90% of oil-related activities take place in the Niger-Delta as it is the area of the West African coastline richest in mineral resources, attracting significant international investment. In 2006, the state-owned *China National Offshore Oil Corporation* paid US$ 2.3 billion for a stake in a Niger-Delta oil-field. This was China’s largest single investment in Africa as at 2006 (Ekweozor, 1989; CNN, 2006). Timber is widely used in mangroves of the region, and markets for its trade are well developed. As mangroves are the main forest trees in many of the coastal zones in which they occur, they are exploited for domestic fuel, fish-processing, salt production, construction of boats, houses and fences as well as production of tools (UNEP, 2007). Salt production is an important industry, in particular, in the lagoon systems between Côte d’Ivoire and Benin. In Ghana, for example, large-scale commercial salt production for export is an important economic activity in coastal wetlands (NOAA/NOS, 2002). In the Republic of Guinea, much of the salt consumed is from local coastal production (Said, 2007).

ISSUES IN MANGROVE MANAGEMENT

Many mangroves in West and Central African countries are subject to the over-extraction of timber and non-timber forest products as well as to unsustainable fishing and wildlife use, often driven by poverty and the need to meet daily needs. Such over-use leads to

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degradation of the mangrove resource and, in some cases, its complete removal (Din et al., 2008). Sadly, natural regeneration is sometimes poor and rehabilitation can be difficult and costly.

Pollution derived from single or multiple sources including industry, sewage, dredging, pond effluent, agricultural and urban runoff and involving pollutants such as solid wastes, toxic chemicals, hydrocarbons and persistent organic materials - can lead to the loss of biodiversity, declines in mangrove productivity and, in extreme cases, complete destruction. Upstream activities such as dam construction, water diversion and deforestation alter the flow regimes of freshwater into mangrove ecosystems, often causing marked reductions, especially in dry seasons and arid environments. This can lead to a build-up of salinity in water and soils and changes in sedimentation patterns that affect coastal configuration and the structure of navigational channels, with the potential to alter physiological processes and cause the loss of mangrove species or their substitution by other communities. Coastal modifications such as the construction of sea walls, ports and dredging can also alter tidal circulation patterns, which in turn, can lead to structural and functional changes.

Conversion due to the development of infrastructure, residential areas and for agriculture, cattle-ranching, salt pans and mining causes the direct, irreversible loss of mangroves. Mangrove soils are often only marginally suitable for agriculture, yet the conversion of mangroves for this purpose is widespread. Conversion in one area can often lead to uncontrolled degradation and elimination in adjacent mangrove ecosystems. Concern about mangrove loss is highly variable, but a few countries in West and Central Africa like Guinea-Bissau, Nigeria, Cameroon and Gabon have created networks of protected areas that include mangroves. In some cases, considerable effort has been made to involve local communities and garner broad support, but sustainable use of mangroves is encouraged (FAO, 2005).

In the absence of laws specifically on the sustainable management and conservation of mangroves, decisions on mangroves are rarely made in the interest of local communities, tending instead to favour large-scale commercial interests such as oil extraction and shrimp-pond construction. Where they exist, legal and policy instruments for mangroves are often dispersed between institutions dealing with fisheries, forestry, development planning, agriculture and the environment. Many laws are weak, and are either inappropriate or rarely enforced, and little consideration is given to the socio-economic needs of coastal people. Countries that share mangrove resources rarely coordinate their policies and management regimes.

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THREATS TO THE MANGROVES AND DRIVERS OF CHANGE IN WEST AND CENTRAL AFRICA

Threats to the mangroves are not so different from those of other forest formations. UNEP (2007) lists them to include: population growth and urban development in the coastal zone, economic and political trends as well as climate change. Cultural factors also cannot be ruled out. A combination of these factors has contributed to the observed decline in the prevalence and significance of the mangroves in West and Central African countries.

Global trends indicate that urban population growth is on the rise. West and Central African countries are no exception. Interestingly, also the major cities, which have potential for employment, are along the Atlantic corridor. This has led to the influx of people from the hinterlands in search of sustenance. Such cities include Douala, Dakar, Accra, Lagos, Abidjan, Port Harcourt, Libreville, Freetown and Monrovia among others. With this trend, the environment in these countries continues to witness serious progressive perturbations, with urban slums created in and around the creeks where mangrove vegetation exists. These have varied and differentiated potential adverse environmental impacts and threats to human health. With continuous infrastructural decay worsened by mindless corruption in some of the countries in question, cities and highways are now flooded at will, and causing needless havoc (Plate 1).

Plate 1. Flooded Catchment of Ogun River by Isheri, Lagos-Ibadan Expressway (hitherto populated by mangroves and other forest formations)

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It is instructive to state that mangrove stands gave way to many of the urban slums. As demands for building materials, fuel-wood and other domestic requirements increase, the mangrove ecosystems declines correspondingly and so do the services they provide. Associated with this are illegal and unregulated fishing techniques that use poisons and dynamites, which according to the National Geographic (2001), further undermine the structure and function of mangrove ecosystems. Wastes that result from these developing urban centres, such as sewage, litter and chemical pollutants are contaminating the waters that provide valuable breeding grounds for commercially important fish in the mangroves. Apart from overpopulation and urbanization, there are civil, political and military conflicts of the last 25 years in several countries in the sub-regions. In times of conflict, priorities for both government and the population change, and tend to focus on the short-term. This has driven deforestation in some countries such as Liberia and Sierra Leone (WRI, 2003).

In the creeks of the oil-rich Niger-Delta in Nigeria, agitation for "resource control" has led to the emergence of several militia groups, many of which operate in the mangrove swamps. The mangrove forests also provide refuge for displaced or fleeing communities. On the economic front, industrialization and its associated impacts such as effluence disposition and dumping of wastes from other countries, as reported in Koko, Nigeria in 1988 and Cote d'Ivoire in 2006, can pose threats to the mangroves. Oil thefts and spillages in the creeks and along the coast of Cameroun, Gabon and Nigeria are also emerging as key threats to the well-being of the mangroves. Other threats include gas flaring, canalization, siltation, sand mining and construction of embankments (Ekweozor, 1989; Isebor and Awosika, 1993). Large-scale disturbance of the biophysical environment arising from such human activities as farming, illegal logging, oil prospecting and exploration, including their associated externalities have led to the deforestation of sizeable portions of the Stubb's Creek Forest Reserve in Akwa Ibom State, Nigeria, which hitherto harboured some sizeable mangroves (Popoola et al, 2004). Worse still, according to Said (2007), many countries in the sub-regions are not yet signatory to relevant international agreements for the protection of their marine and coastal environments, such as the International Convention for the Prevention of Pollution from Ships (MARPOL) or the United Nations Convention on Law of the Sea (UNCLOS), representing an area of particular potential concern with respect to the marine ecosystem services.

Mangroves are considered as very important for climate change mitigation and adaptation. However, climate change is also considered as an emerging threat to the sustainability of forest formations including mangroves. According to UNEP-WCMC (2003) there are likely to be both positive and negative effects on mangroves as a result of climate change, although it is uncertain exactly what the outcomes will be as local variability will be high. Furthermore, Nyong (2005) observes that the balance between anthropogenic pressures, sedimentation and erosion as well as the rate of sea-level rise will be crucial as to how mangroves respond to climate change. There is, however, evidence of impact of climate change along

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the shorelines of many countries along the Atlantic Ocean. For example, Okali (2008) reported that, of the 3176 km of Nigeria's coastline, over 1000 km is under threat, occasioned by climate change over a period of about 10 years (1998 to 2008) (Figures 2a and 2b), leading to the loss of valuable forests, mostly the mangroves and other aquatic and marine resources. Since most tropical forests fall in the category of trans-boundary ecosystems shared by several countries, and at a lower scale, shared by several communities, this threat is likely to affect other countries with mangrove forests in the West and Central African sub-regions.

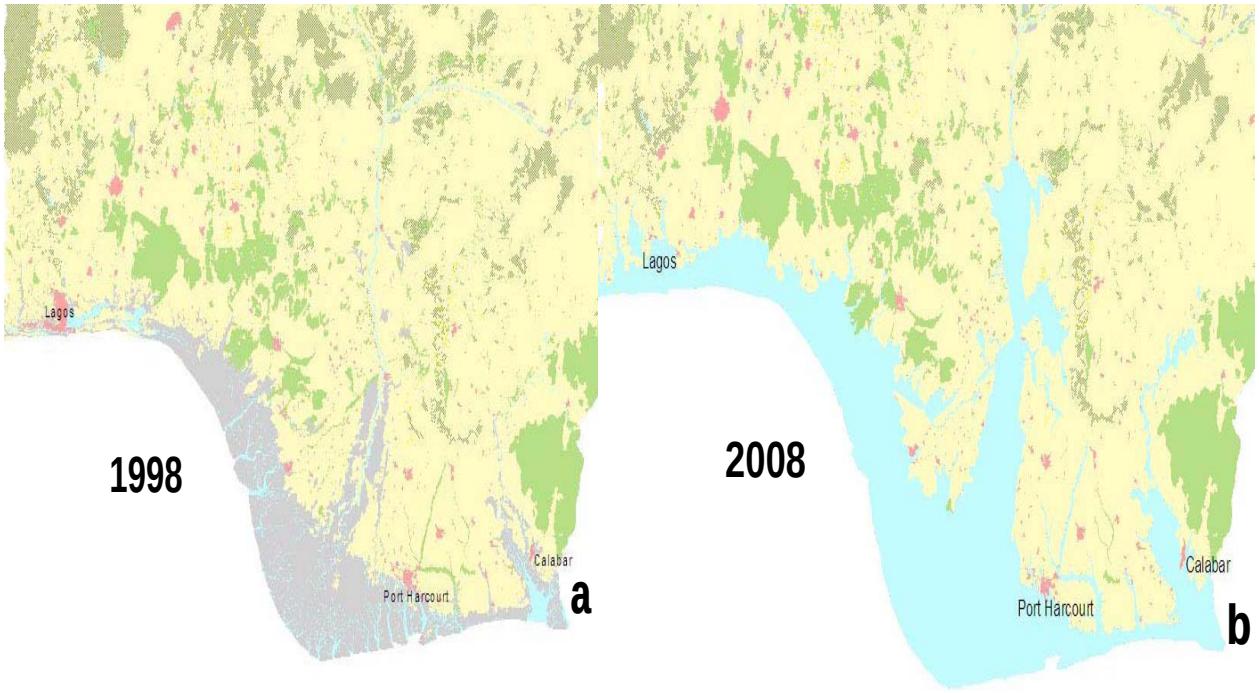

Figure 2. Climate change threat along Nigeria coastline (1998 to 2008). Source: Okali (2008)

EXAMPLES OF ACTIVITIES TO COMBAT THREATS TO MANGROVES IN WEST AND CENTRAL AFRICA

Deforestation rates in West and Central Africa are among the highest in the world and this has been linked to weak institutions and poverty among communities, whose livelihoods depend directly or indirectly on natural resources provided by forest and non-forest ecosystems. The mangroves, in spite of their relative resilience, are no exception to the onslaught on the ecosystem. This has been exacerbated by the influx of populations into coastal areas. According to UNEP (2007) mangrove restoration efforts have been conducted in almost all the coastal nations along the Gulf of Guinea. They include:

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- *Gulf of Guinea Large Marine Ecosystem Project* from 1995 to 2000, which undertook pilot mangrove restoration projects facilitated by NGOs in Côte d'Ivoire, Ghana, Togo, Benin, Nigeria and Cameroon.
- *The Lower Volta Mangrove Project*, supported by the UK, which included pilot restoration activities in Ghana. The project sought to develop landowner- and community-based approaches for the rehabilitation and long-term sustainable use of mangrove resources in the Volta River estuary area. DFID (1996) reported that for sustainability the project had a capacity-building component, which trained Ghana Wildlife Department staff to undertake studies independently.
- *Community restoration in Ghana*, which involved two communities undertaking mangrove restoration projects of degraded areas with the assistance of the NGO, Resource & Environment Development Organisation (REDO) and the Forestry Department at Winneba, Ghana.
- *The West African Mangrove Initiative* (Thompson, 2010), in Sierra Leone, one of Africa's poorest nations still recovering from a 1991-2002 civil war, in which lawmakers have worked on a bill to join a seven-nation charter to protect the region's mangrove forests. Conservation group Wetlands International says the initiative is essential for West Africa to save the 800,000 hectares (2 million acres) of mangrove swamps it has left, less than a third of the 3 million hectares it started with. The initiative aims to help nations coordinate efforts to rehabilitate the mangroves by replanting trees and providing alternatives to wood. Following a pilot project in neighbouring Guinea, the initiative plans to introduce solar powered salt extractors. Pouring saltwater onto a flat, open tarpaulin to about 1cm deep, the salt crystals, resulting by the evaporation of the water, are then left to dry out in the sun.

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CHAPTER 3 Assessment of the Status of Mangroves in West and Central Africa

WEST AFRICA

The respective forest areas and the extent of the mangrove covers as well as coastlines in West African countries are presented in Fig. 3. The twelve West African countries (Benin, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mauritania, Nigeria, Senegal, Sierra Leone and Togo) have a total forest area of about 540 480 km2 (FAO, 2011). Cote d'Ivoire has the largest forest cover among the countries, which is about 19% of the sub-region's total forest cover. This is followed by Nigeria with about 17% of the total forest cover. The third and fourth countries are Senegal and Guinea Conakry with 15.7% and 12.1% of the total forest area, respectively. Countries with lowest forest covers (less than 1%) of the total forest area include Mauritania, Togo and Gambia with 0.47%, 0.53% and 0.89% respectively. The mangrove forests in the sub-region cover an area of 16,709.09 km2, which is approximately 3% of the total forest areas for the twelve West African countries. Of the total mangrove forests in the sub-region, Nigeria has the largest cover, which is about 44% of the total mangrove forest in the sub-region. This is followed by Guinea Bissau, with mangrove cover of about 18% of the total mangrove area. The third country is Guinea Conakry with an estimated mangrove cover of about 12% of the total. The country with fourth largest mangrove forest in the sub-region is Senegal with about 8% of the total mangrove area in West Africa. Liberia and Sierra Leone have 6% each of the total mangrove area in the sub-region. Countries with very small mangrove cover include Mauritania, Togo, Benin and Ghana with about 0.01%, 0.07%, 0.4% and 0.8% of the total mangrove forests respectively.

The total coastline in West Africa is about 15 269.8 km long. Guinea Bissau has the longest coastline (3 176 km) in West Africa, which is about 21% of the total coastline in the sub-region. This is closely followed by Nigeria (3 121.9 km), which has approximately 20% of the total coastline in West Africa. The third is Sierra Leone (1 677.1 km), with about 11% of the total coastline in the sub-region. Togo has an almost insignificant coastline of 0.35% of the total in West Africa. Decline in the mangrove cover has been reported in all the countries over the years.

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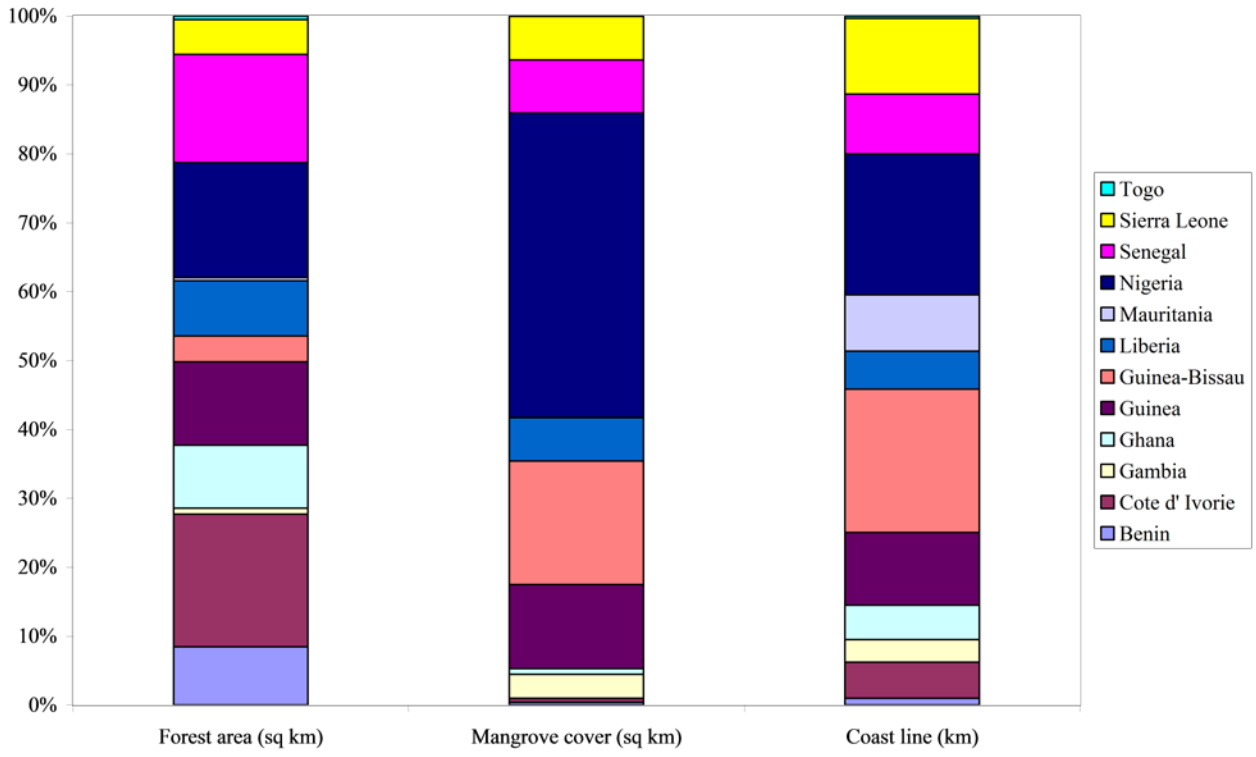

Figure 3. Forest area, mangrove cover and length of coastline in West African countries, as percentages of totals for the sub-region

CENTRAL AFRICA

The forest area and the extent of the mangrove cover, as well as length of coastline in Central African countries are presented in Fig. 4. The seven countries (Angola, Cameroon, Congo, DR Congo, Equatorial Guinea, Gabon and Sao Tome and Principe) have a total forest area of about 2 785 950 km2. About 55% of this total forest cover (1 541 350 km2) is in the Democratic Republic of Congo. The forest area of DRC alone is about 185% of the total forest area for the 12 West African countries. The country with the second largest forest area in Central Africa is Angola with a forest area of 584 800 km2, which is about 21% of the total forest cover for the seven countries. The country with the third largest forest area in this sub-region is Congo with about 8% of the total forest area. Gabon also has approximately 8% of the total forest cover. The country with the least forest cover in the sub-region is Equatorial Guinea with just 0.58% of the total forest cover.

The mangrove forests in Central Africa sub-region cover an area of 5 972.4 km2, which is approximately 0.21% of the total forest area in the sub-region. Equatorial Guinea, which has the lowest forest cover in the sub-region, has the largest mangrove area of approximately 1

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957 km2, and about 33% of the total mangrove forest in the sub-region. This is followed by Cameroon with about 1 857 km2, which is 31.09% of the total mangrove forest. The country with the third largest mangrove cover in the sub-region is Gabon, with about 27% (1 606 km2) of the mangrove forest area. Sao Tome and Principe has the least mangrove cover in the sub-region. Details of the proportions (percentages) of mangroves for each of the Central African countries are shown in Fig. 4.

Central African countries have a total coastline of about 23 538 km long. Cameroon has the longest coastline (2 251.8 km), which is about 76% of the total coastline in the sub-region. This is followed by Gabon with 2 019.1 km coastline, which is approximately 27% of the total coastline in the sub-region. Congo and DR Congo have the shortest coastlines of 178.8 km and 205.1 km, which amount to 0.75% and 0.87% of the total coastline, respectively. Large scale deforestation of the mangroves has occurred in all the countries of Central Africa in the last two decades, leading to a progressive decline.

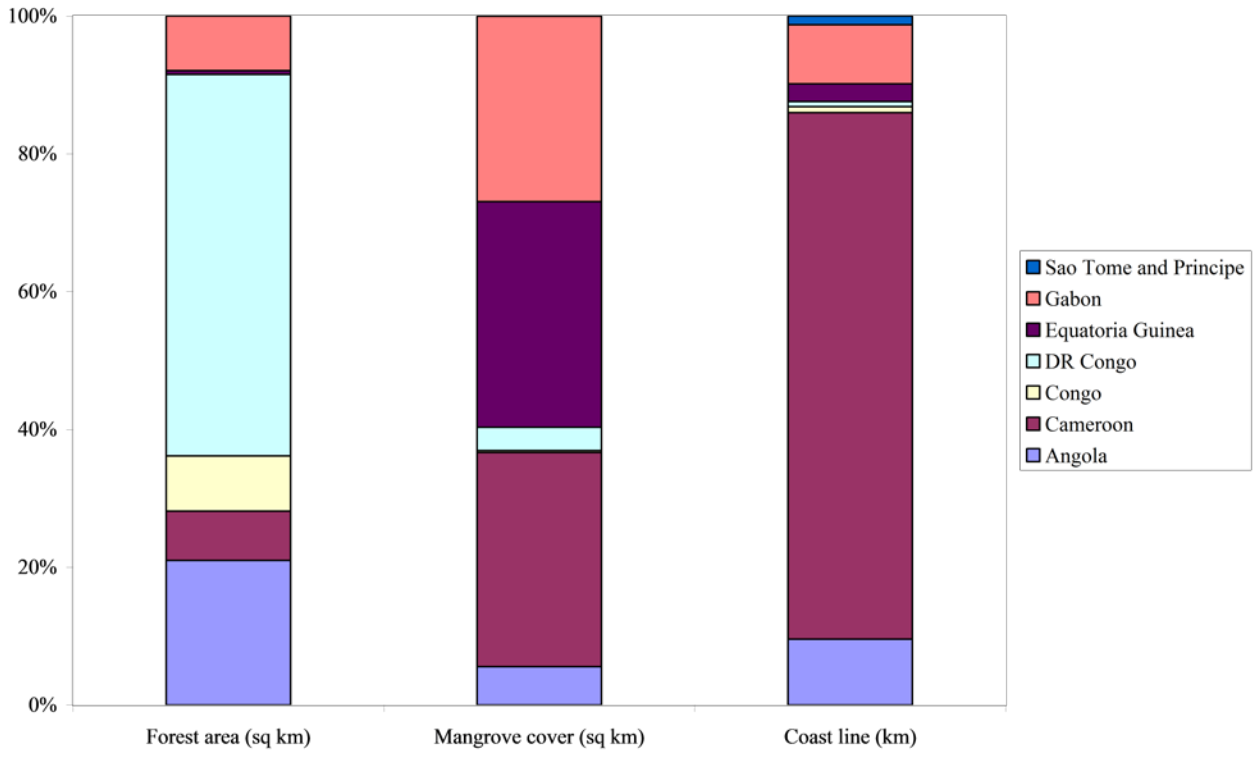

Figure 4. Forest area, extent of mangrove cover and length of coastline in Central African countries, as percentages of the totals for the sub-region

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CHAPTER 4 REDD+ Activities in West and Central Africa

Reports on REDD+ activities in the mangroves of West and Central Africa are scanty. However, the potentials are recognized. For example, with exceptional CO2 capture/sinks, maximum sink capacity, six times that of Amazonian rain forest and supporting endangered biodiversity, ecosystem goods/services that support communities, mangroves are considered to be relevant to REDD+. In this section, we report country by country, REDD+ activities in general, and how they relate, or may relate to the mangroves.

Benin

Benin has signed up and has been through the first review, and presented implementation progress reports on their national plan of action. In Benin, participatory monitoring of the implementation of POAs has been conducted at district and regional levels along with opinion surveys to gauge public perceptions of the success of the African Peer Review Mechanism (APRM).

Côte d'Ivoire

Cote d'Ivoire has difficulties in supporting the implementation of this very important mechanism for a sustainable management of its natural resources. The political crisis being over, there has been a strong will of government to reduce deforestation and to carry out a reconstitution of the forest area. The REDD+ programme has come as a considerable support and is seen as a catalyst for a transformation towards a green economy. It is one of the major projects of the Ministry of Environment and of Sustainable Development. It includes implementation of surveys for a participatory benefit distribution with communities of carbon incomes resulting from REDD+, establishment of carbon social projects for the benefit of communities with these incomes.

With strong political support, the country is carrying out a REDD+ national Programme with a harmonization of various sectoral policies. The National Coordination for REDD+ also envisages popularizing and intensifying agroforestry as a prelude to the REDD+ programme. To this end, a survey will be carried out, in collaboration with the Ministry of Agriculture, on a project developing a set of themes for the coffee-cocoa industry and conservation of the biodiversity. A capacity building workshop for launching of REDD+ was organized in September, 2011. There is a willingness to implement REDD+ integrated strategy for socio-economic development in the country. For a harmonization of the concerned sectoral policies, a REDD+ national interdepartmental coordination was set up

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while some REDD+ projects have been established in the zones of high anthropogenic pressure on natural resources.

Ghana

Ghana developed its national REDD+ strategy in 2010 with support from public sources of finance and multilateral initiatives. The country's recently approved R-PP, highlights a range of focus areas and activities to be promoted within the Ghanaian national REDD+ strategy. These include, among others, to: (i) improve timber supply and timber stock enhancement on reserve and off-reserve areas; (ii) improve the emissions profile of activities related to charcoal and fuel-wood production; (iii) encourage carbon-friendly cocoa sector production; and (iv)reduce emissions via improved fire management. The REDD+ focus areas of the R-PP resulted in both national and sub-national level interventions as follows: The timber supply improvements focus on improving the sector's efficiency. This occurs via reforms to tree tenure, potentially regulating export tariffs and controls, or defining investment criteria that lead to increased carbon stock. In addition to these national level interventions, site level actions include improved forest management, incentives to increase the development of plantations, and/or rewarding community forest management activities that increase timber supply.

Ghana has established a number of institutions with responsibilities for REDD+ in the country. These are working concurrently with various forest sector institutional and governance reform efforts taking place in Ghana such as the Natural Resources and Environmental Governance Development Policy Operation (NREG) and the Voluntary Partnership Agreement (VPA) concluded under the EU Forest Law, Enforcement, Governance and Trade (FLEGT) process. The National REDD+ Steering Committee (NRSC) within the Forestry Commission was established to advise the Ministry of Land and Natural Resources (MLNR) on REDD+ issues and lead REDD+ management, the Climate Change Unit of the Forestry Commission serving as the Secretariat of the NRSC. The NRSC is composed of ministries, private sector, civil society groups, local communities, landowners and other relevant stakeholders and serves as a forum to share knowledge and experience on REDD+ initiatives in order to inform policy formulation and develop projects and programmes.

Liberia

In Liberia, the REDD+ process is opening up a whole new front in the ongoing struggle to advance community rights in the country's forest sector. Liberia holds approximately one third of the remaining Upper Guinea forests of West Africa and it developed and submitted an R-PP to the World Bank's FCPF in October 2010. This process has been accompanied by debate on community rights and meaningful participation, among the government and its allies, Conservation International (CI) and Fauna and Flora International (FFI). Though

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forest governance is weak in Liberia, there is some hope that REDD+ activities will change this situation. The establishment of a strong institutional mechanism (National Carbon Working Group), to coordinate REDD+ activities with the overall sustainable development agenda of the country has been suggested for Liberia.

Mauritania

Government of Mauritania has shown its readiness to participate in REDD+, and is to carry out reforestation to increase forest cover from 3.2% in 2009 to 9% by 2050.

Nigeria

Nigeria is a partner member of the UN-REDD Programme, which is a UN partnership (consist of FAO, UNDP and UNEP) that aims to support countries in REDD+ readiness preparation, providing technical, policy, financial and stakeholder-engagement advice and support. In 2010 UNDP/Nigeria office provided catalytic finance to jump-start awareness-raising, stakeholder dialogue and planning around a REDD+ process in Nigeria, as part of its on-going strategic support to Nigeria on the challenges and opportunities around climate change. The UN-REDD Programme has been providing advisory support to the Federal and Cross River State authorities in the initial stage of REDD+ readiness preparation, including a scoping mission that was successfully conducted in October 2010 – the mission found impressive commitment to REDD+ in the country and concluded that full REDD+ readiness finance is critically needed to sustain Nigeria's progress and to respond to the interest encountered.

Currently, the Nigeria REDD+ Readiness Programme, which seeks to build the REDD+ mechanism in the country using Cross River State as a demonstration model, is being promoted under the UN-REDD track. Nigeria has secured a US$4 million funding for the two-and-half-year project, which officially commenced in September 2012 and ends in February 2015. Also, the UN-REDD Programme has supported a short-course on the basis of REDD+, as well as conservation, sustainable management of forests and enhancement of carbon stocks) in Cross River State, Nigeria.

Senegal

In October 2008, the Ramsar Convention Secretariat, IUCN and the Danone Group (a multinational company known for its yogurt and water brands) signed a Memorandum of Understanding to work together to preserve and restore wetland ecosystems that are crucial to the carbon cycle, in various locations across the planet. This partnership aimed to develop wetland carbon methodology specifications for measuring carbon sequestration in restored mangrove ecosystems, and to design and implement pilot wet carbon projects. In this partnership, Ramsar Convention and IUCN have an advisory role, providing Danone

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with technical advice on whether wetland carbon methodologies and guidance, wetland carbon projects. To date, the company has decided to invest in two pilot projects of which Senegal is the only beneficiary in Africa. The project is funded with the aim of providing an initial test of the wet carbon approach and to derive lessons for further development of a new class of wet carbon investments.

Sierra Leone

In Sierra Leone, the Forestry Division of the Ministry of Agriculture, Forestry and Food Security has been strengthened in terms of institutional structure, policy framework, technical capacities, law enforcement capacities and logistical support. This involves technical assistance, staff training needs assessment and delivery of training, seminars and workshops to discuss policy options on the management of forest resources and REDD+. All stakeholders are involved in capacity building activities. The basic REDD+ readiness has also been completed in the country. This involves completion of a forest and carbon inventory; development of monitoring, reporting and verification (MRV) system for REDD+; completion of an opportunity cost assessment for the conversion of forest areas; and the provision of inputs into the definition of a national REDD+ policy.

Angola

The Republic of Angola has since 2011 indicated its willingness to tap into the benefits from REDD+. To this end, Angola has agreed on a comprehensive programme to support the SADC region in its efforts to combat climate change and achieve its development goals through reduced emissions in the forestry sector. Angola believes that allowing REDD+ to traverse many countries would minimize transaction costs, as resources, including institutional capacities, would be shared between countries. In addition, implementation of REDD+ at the ecosystem level will ensure that the ecosystem is considered as a whole, and as a result the risk associated with leakage would be minimized. Further, this would also assist in including small forest areas in countries, which themselves would not be able to set up an individual REDD scheme.

Cameroon

In Cameroon many initiatives are in the planning and start-up phases, including biodiversity conservation, activities to support the livelihoods of communities, integrated management of mining, forestry and hunting activities, artificial regeneration (afforestation and reforestation), development of participatory plans for land allocation, low-impact logging activities, protection against fire and straying cattle, and agroforestry (Sonwa and Minang, 2009). The scale of projects being proposed also varies, ranging from a small community forest of no more than 5000 ha to a transnational forest landscape of some 4 520 000 ha,

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via a medium-sized landscape of 870 000ha. This array of activities fits in with the broad vision of REDD+ that is being supported by Cameroon and the other COMIFAC countries and includes reduced deforestation and forest degradation, conservation, sustainable forest management and carbon stocks enhancement. Cameroon national REDD+ programmes include reforestation, forest management and the fight against illegal exploitation.

Democratic Republic of Congo

By virtue of the large share of forest cover of DRC, which is critical for REDD+ at the national, regional and global levels, the REDD+ Programme of DRC commands a high status in both local and global dialogue on forests and climate change. Largely because of this, it has received the largest flow of funds of any of the REDD+ countries in Africa, and is a member of both UN-REDD and the FCPF processes. Prior to these two processes, it had also been a leading country in the Congo Basin Forest Initiative, the COMIFAC, which produced the 'Yaounde Declaration', which was made by the Presidents of countries in the basin (Kojwang and Ulloa, 2012). The DRC REDD+ Process Phase I (Readiness Development) ended by December 2012. In the current project document, a US$12 million budget has been elaborated for the beginning of Phase II in 2013, and so far US$10 million has been secured, leaving a gap of US$2 million. Despite theUS$2 million shortfall, by the end of 2012, the DRC aimed to have attained key annual targets it had set for the REDD+ Programme, namely: (i) A full REDD+ Strategy Document; (ii) Four-year action plan; (iii) Reference Levels; (iv) MRV System that is compliant with Phase II and (v) Key Reforms and Institutional Arrangements for the Implementation of REDD+. Some of the targets would not have been reached by the end of 2012 and will continue in 2013. These include MRV system and structure, capacity building, decentralization of REDD+ into the provinces and the strengthening of provincial structures, tenure reforms and benefit sharing models.

Some of REDD+ Projects and Activities in DR Congo include:

- WWF - EcoMakala REDD+ project;
- ADAPEL - Phasing out slash and burn farming;
- Conservation International - Community Reserves REDD Project in Eastern Democratic Republic of Congo, ICCN and ACOPRIK: Sankuru Community "Fair Trade" Carbon and Bonobo Conservation Initiative (BCI);
- Isangi Integrated REDD+ Pilot Project;
- Integrated agroforestry REDD+ project, South Kwamouth;
- Mambassa REDD+ pilot project;

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- Africa Wildlife Foundation - Maringa-Wamba-Lopori REDD+ pilot project, Zoological Society of London – Virunga-Hoyo REDD+ project.

Equatorial Guinea

Equatorial Guinea has only just started governmental interest in REDD+ by submitting a Readiness Preparation Idea Note (R-PIN) through the FCPF. However, they have not yet signed a participation agreement in order to obtain access to programme development funding.

Congo

Congo Republic is part of the larger Congo Basin region, which contains one quarter of the world's tropical forests. Protecting the region's forests has become a crucial part of the international effort to combat global warming. Yet the Congo Republic, like other countries in the Congo Basin, is still putting the systems in place to implement an effective strategy to reduce emissions from deforestation and forest degradation (REDD+) and to participate in future programmes that incentivize reduction in emissions from these sources (Kemen et al., 2010). To support this effort, WRI spearheaded an innovative new project entitled Quantifying Forest Degradation and Associated Greenhouse Gas Emissions in the Forests of the Republic of Congo. Planned project activities were to quantify greenhouse gas emissions from the country's forests; develop new methods to measure and monitor forest degradation; build in-country forest monitoring capacity, and ensure that spatial data sets are transparent and publicly available. WRI was to coordinate these project activities with stakeholders from the Ministry of Sustainable Development, Forest Economy and Environment (MDDEFE) in the Republic of Congo, in a process facilitated by the country's National REDD Coordination Committee (CN-REDD). The Republic of Congo started to participate in REDD+ in 2008, in the context of the World Bank's Forest Carbon Partnership Facility (FCPF). The country's objectives and plans for REDD+ readiness preparation are outlined in its Readiness Preparation Proposal (R-PP), which was finalized in late 2011. A US$3.4 million grant agreement between the World Bank and the Ministry of Finance to support REDD+ readiness plans in the Republic of Congo was signed in January 2012. In March 2012, UN-REDD approved a request for funding of US$4 million to support the national REDD+ process in the Republic of Congo.

The National REDD+ Coordination Committee (CN-REDD), already operational, is the executive body in charge of the daily management of REDD+; it is housed within the Ministry of Sustainable Development, the Forest Economy and the Environment. A platform to coordinate civil society and indigenous peoples' engagement in the REDD+ process has been created (*Cadre de Concertation des Organisations de la Société Civile Congolaise et des Peuples Autochtones sur la REDD*+; CACO-REDD+). Stakeholders are also formally involved in decision-making through their participation in CONA-REDD, whose organization

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includes four platforms: a government platform, a civil society platform, an indigenous peoples' platfor, and a private sector platform.

Gabon

In Gabon, the office of the President and the Ministry for the Environment are responsible for REDD+ policy. A National Climate Council has recently been created on April 22nd, 2010. At present, deforestation is not an issue in Gabon because population pressure on the forest resources is low and the government development policy is partly based on forestry. The argument is made that policy can be changed over time and lead to conversion of forests for commercial agriculture and energy crops. Forest degradation is an issue where timber harvesting is done without management plans. As long as there is a clear policy on sustainable forest management, there is no need for the narrow focused programme on reducing deforestation. Urban development will happen and thus deforestation is needed for that kind of development. It would be an illusion to tackle that kind of deforestation with a REDD incentive scheme. The issue is rather one of an extended REDD approach, that includes how to keep existing high carbon stocks intact and how to restore degraded carbon stocks to full carbon stocks, in both production forests and conservation forests. Some REDD+ programmes currently being implemented and financed by national government in Gabon include programme for the "sustainable development of forest management plans for national parks" (financed by government and other investors interested in reducing deforestation); "Scientific study on carbon stocks and flows Forest inventory" (financed by Universities of Oxford, Leeds, Edinburgh; UCLA, JICA, AFD). A 3 year grant awarded to FERN from the CBFF, to strengthen the capacity of NGOs in Gabon to support the incorporation of national and international REDD+ policies and the development and promotion of transparent mechanisms to ensure that REDD+ revenues are transferred effectively from national to the local level. This capacity building programme also seeks to create NGO coalitions to work at different levels on REDD+ related issues.

Sao Tome and Principe

Sao Tome and Principe as a country with low forest cover, is at the preliminary phase of the REDD+ process. Its first national climate communication was submitted in 2001 and its NAPA in November, 2007 (with GEF Funding). Sao Tome & Principe at this point has only been working with GEF on several small climate adaptation projects. There has been no active governmental interest in REDD+ by the country.

From the foregoing, REDD+ activities have not adequately taken root in the mangroves of West and Central Africa. However, being a market-based mechanism, REDD+ can contribute to funding for mangrove restoration, avoided deforestation and degradation, and rural livelihoods promotion activities.

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CHAPTER 5 Summary of Major Findings

Mangrove ecosystems are rich in biodiversity and harbour a number of floral and faunal species (both terrestrial and aquatic) many of which, e.g. the manatee, dolphin, estuarine crocodile etc. are endangered. They also act as nurseries for fin fish, shell fish, crustaceans and molluscs. Mangrove forests are regarded as the most productive ecosystems in the world on account of the large quantities of organic and inorganic nutrients released in the coastal waters by these ecosystems. The mangroves, besides providing a number of ecological services also play a major role in protecting coastal areas from erosion, tidal storms and surges (tsunamis).

A press release by ITTO et al. (2010) indicates that there is also considerable storage of organic carbon in mangrove soils, meaning they may have an important role to play in the process of mitigating climate change. Preliminary estimates indicate that the total above-ground biomass for the world's mangrove forests may be over 3 700 Tg of carbon, and that carbon sequestration directly into mangrove sediments is likely to be in the range of 14–17 Tg of carbon per year. According to Duke et al. (2007) and FAO (2007), the numerous ecosystem services and geographic distribution of mangroves present some mitigation strategies, which could be effective in providing ancillary benefits as well as potential REDD+ opportunities in many West and Central African countries.

Mangroves help in land accretion by trapping fine debris particles. They are also an important source of honey, tannins, wax, besides fish. With only 18.1 and 21.2 percent respectively of West and Central African mangroves, respectively, reportedly protected, there is an urgent need to initiate REDD+ schemes that will promote the restoration of mangroves in the sub-regions. The fact that land-use and the human-use pressures on mangroves affect not only standing stocks but also ecosystem response to sea-level rise, maintaining these ecosystems requires urgent attention, of which the REDD+ initiative offers a cost effective option, while contributing to mitigating climate change in the sub-regions. Economic assessments provide some of the most powerful arguments in favour of mangrove management, protection or restoration. Studies estimate that mangroves generate US$2 000 – US$9 000 per hectare annually, considerably more than alternative uses such as aquaculture, agriculture or insensitive tourism (ITTO et al. (2010).

Currently, the mangroves are among the most threatened ecosystems on account of both anthropogenic factors (urbanization, reclamation of land, discharge of waste etc.) and natural factors like global warming/climate change. The published decline rates in West and Central Africa are alarming, yet the real figures may be higher. One of the limiting factors in the management of the mangroves in the sub-regions is the dearth of mangrove specialists in scientific and management institutions, law enforcement agencies and local communities.

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There is a lack of exchange of knowledge and experience between professionals and coastal dwellers. In most of the countries, there is considerable scope for improving public understanding and appreciation of the value of mangrove resources and the benefits that can be derived from them. This awareness should not only form part of the formal educational system but also be offered to the general public, decision-makers and local people.

At the moment, REDD+ activities in the countries of the sub-regions have not taken root in the mangroves. Though mangroves are known to benefit coastal communities in myriads of livelihood options, which can be integrated in REDD+ schemes, there are limited carbon certification schemes under REDD+ that are open to mangrove forests. With the increasing promotion of inclusion of the mangroves in REDD+ mechanisms by some notable research and development organizations such as the UNDP, FAO, Danone, Wetlands International, the IUCN, Ramsar through the Wetland Carbon Partners and the African Forest Forum through its Climate Change Programme (AFF-CCP), there is hope for harnessing the potentials of mangroves into the REDD+ scheme. King (2012) reports that pilot mangrove REDD+ project at Gazi Bay, 60 km south of Mombasa, provides insights into whether mangrove-based REDD+ projects are feasible and their potential benefits for surrounding communities. Though the study identified several obstacles to realizing REDD+ in the mangroves, it also identified several opportunities. As noted by Oyebo (2011), the great diversity of forest types and conditions in Africa is at the same time the strength and the weakness of the continent in devising optimal forest-based responses to climate change. The challenge remains how to mitigate the obstacles and optimize the opportunities. This should however, be surmountable, considering the upsurge of interest among stakeholders.

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CHAPTER 6 Recommendations

Protecting mangrove forests through their inclusion under REDD+ could provide financial benefits to mangrove-bearing coastal nations and communities. The mangroves in the two sub-regions appear to hold some potential for the realization of REDD+ because of their relative resilience and their contiguity which places them in good stead for trans-boundary management approaches. To achieve REDD+, adequate understanding of the social benefits and impacts of REDD+ in coastal communities in West and Central Africa is key. More importantly, there will be the need to address challenges constraining the ready adoption of the scheme in the continent, and in the specific context of the mangroves. These are generally categorized as outlined below, along which recommendations are made:

Political and institutional challenges

First, cooperation among the concerned countries is a political imperative that must be addressed as it can enhance collective bargaining and negotiation. But, there are already emerging suspicions on the justness/fairness of REDD+ (Nurhayati,2009), arising from uncertainties about the power relations among actors in the REDD+ scheme, across different levels - international, national, sub-national and local, and how this determines who gains and who loses from REDD+ projects. This must be frontally addressed. Secondly, significant community assistance flows (legal, cultural, technical) can be achieved through government and NGO involvement and utilization of available local, bilateral and multilateral institutions. Also, the fact that the mangroves of the sub-regions are associated with crude oil fields portends further challenges. This relates to the issue of permanence and liability. How will the trade-off between the temporary benefits of oil exploration and the long-term benefit of REDD+ be addressed? Will governments have the discipline to adhere to agreements?

Technical challenges

The fact that inhabitants (both indigenous and immigrants) of mangrove enclaves and adjoining areas have strong reliance upon three main categories of mangrove goods for subsistence as cash: firewood, food, and building materials will make it difficult convincing them that REDD+ offers better livelihood prospects. Achieving this will require the adoption of a phased approach, beginning with capacity and awareness building/strengthening, especially on issues of climate change. Communities must participate actively at all stages of a REDD+ projects. Building community level technical, legal and financial capacity to undertake projects therefore, becomes an important success factor. Similarly, Monitoring, Reporting and Verification are highly technical issues requiring requisite capacities and

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capabilities, which many of the countries in the sub-regions lack at the moment. This will require capacity building in the forest services (policy, research and training). Expertise is also required for improved management of the existing mangroves, defining spatial and temporal boundaries, analyses of historical land-use/land-cover changes, identification and analysis of drivers of change, projection of future deforestation in terms of location and/or quantity, estimating baseline carbon stocks, estimation of actual carbon stock changes, estimation of decrease in carbon stock factoring in leakage. Similarly, data gathering on the mangroves in terms of population, composition, age, similarities and diversities indices require technical expertise, and this will have to be urgently addressed at sub-national, national and sub-regional levels.

Socio-economic and cultural challenges

The mangroves offer varied sources of livelihoods for communities that depend on them. They depend on the mangroves for food, shelter, trade and commerce. The activities associated with these are likely to be incongruous with the requirements of REDD+. The scheme will need to pay particular attention to the impacts of REDD+ on local mangrove forest communities and issues of rights to the forest and forest governance. Achieving REDD+ in the mangroves will therefore, require proper planning, which will include securing alternative sources of livelihood for the communities, as well as ensuring that benefit sharing is equitable. Otherwise, as observed by Hajek et al. (2011), a REDD that functions poorly will keep local forest communities and indigenous people imprisoned in extreme poverty. Receding to extreme poverty represents a potential for conflict, which may further destroy the mangroves. Also according to Angelsen and Wertz-Kanounnikoff (2008) the scheme has the potential to improve forest governance and rights, e.g. through more transparent forest information systems. But, it also entails risks such as when the potentially large sums of money generated by REDD+ triggers corruption, mismanagement and elite capture. There is the need for mechanisms to address such matters that may arise.

Resources and funding issues

Here, the efficiency criteria come into focus. According to Angelsen and Wertz-Kanounnikoff (2008), the cost of setting up a REDD+ scheme, including establishing technical infrastructure and governance structures, and, most importantly, training and capacity building is quite significant. Other costs include operational costs of the scheme that, in addition to periodic monitoring, include a variety of policies and measures, such as forest law enforcement and tenure reforms. Also important are the opportunity costs i.e. the foregone economic benefits from the next best alternative (non-forest) land-uses such as oil prospecting and exploration. Other costs will include security cover because of the volatility of the mangrove terrain. These must be factored into REDD+ plans in the mangroves.

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Setting up pilot projects

While there is no REDD+ project in the mangroves of West and Central Africa, Rönnebäck et al. (2007) report a pilot mangrove REDD+ project at Gazi Bay, 60 km south of Mombasa, that provides insights into the feasibility and potential benefits of mangrove-based REDD+ projects. It is recommended that the Gazi Bay pilot REDD+ project be carefully studied with a view to setting up similar pilot projects in different mangrove formations in West and Central Africa.

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CHAPTER 7 Conclusion

The REDD+ scheme, on the surface, appears to be a simple idea (earn income by reducing deforestation and forest degradation). However, actualizing the objectives of the scheme is quite complex. This report clearly shows the common, but differentiated constraints in optimizing the benefits of REDD+ generally and in the mangroves ecosystem in particular. They include politics and policies, institutional, differences in agenda of actors, inadequate capacities, governance issues, and benefit sharing and ownership and common property issues. In the last five years, however, awareness has been increased among many West and Central African countries on the potentials of the mangroves in realizing REDD+. In reality, REDD+ started as a global initiative and much of the debate has been about the global architecture. Although debated extensively at the global level, intensive action is required at sub-national and national levels to realize the objectives of the scheme. Much capacity building of local stakeholders is required to support this intensive local action. Countries of West and Central Africa will need to embark on urgent reforms to complement the financial, technical (including research), legal and administrative capacities that will be built, to ensure the realization of the full potentials of the mangroves in the REDD+ scheme.

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