A PLATFORM FOR STAKEHOLDERS IN AFRICAN FORESTRY

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Review of national plans and programmes related to people, forests and climate change in West Africa

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Acronyms and abbreviations

A/R	Afforestation and Reforestation
BNRCC	Building Nigeria's Response to Climate Change
CBD	United Nations Convention on Biodiversity
CBO	Community Based Organisation
CCD	United Nations Convention to Combat Desertification
CDM	Clean Development Mechanism
CE	Community Educator
CITES	Convention on International Trade in Endangered Species
CSLP	Strategy for Fight against Poverty (Burkina Faso)
EC	European Commission
ENPAB	National Strategy and Action Plan about Biodiversity (Sao Tome & Principe)
FAO	Food and Agriculture Organisation of the United Nations
FEC	Federal Executive Council (Nigeria)
FOSA	Forestry Outlook Study for Africa
GEAP	Gambia Environmental Action Programme
GSGDA	Ghana Shared Growth and Development Agenda
GPRSP	Growth and Poverty Reduction Strategy Paper
IFAD	International Fund for Agricultural Development
INC	Initial National Communication
ITTA	International Tropical Timber Agreement
IUCN	International Union for the Conservation of Nature
LDCs	Least Developed Countries
LDCF	Least Developed Countries Fund
LEDS	Low Emission Development Strategy

LEG	Least Developed Countries Expert Group
MDG	Millennium Development Goals
MRV	Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Actions
NAPA	National Adaptation Plan of Action
NASPA-CCN	National Adaptation Strategy and Plan of Action on Climate Change for Nigeria
NCCAS	National Climate Change Adaptation Strategy (Ghana)
NCCPF	National Climate Change Policy Framework (Ghana)
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organisation
NTFP	Non-timber forest product
PAGE	Programme for Accelerated Growth and Employment (Gambia)
PEDD	Environmental Plan for Sustainable Development (Burkina Faso)
PFAP	Programme for Fight against Poverty (Cape Verde)
PNCLD	National Plan for Fight against Poverty (Burkina Faso)
PRS	Poverty Reduction Strategy
PRSD	Poverty Reduction Strategy Document
PRSP	Poverty Reduction Strategy Paper
RDS	Rural Development Strategy
REDD	Reducing Emission from Deforestation and Forest Degradation in Developing Countries
SIDS	Small Island Developing States
SLR	Sea Level Rise
SNC	Second National Communication
SNDD	Sustainable National Development Strategy (Ivory Coast)

SPO	Socio-Professional Organisation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WCMC	World Conservation Monitoring Centre.

Executive Summary

National Plans and Programmes related to People, Forests and Climate Change in West Africa were reviewed in a desk study, in order to improve understanding of how forests and trees, and the people who depend on them, respond to climate change and variability. The study focused on National Adaptation Plans/Programmes of Action (NAPAs), National Climate Change Strategies, Nationally Appropriate Mitigation Actions (NAMAs) and National Communications to the UNFCCC, and sought to identify gaps and factors influencing their implementation, and how these could be filled through forestry and forestry-related interventions. The study also examined the profiles and capacities of public forest administrations in the studied West African countries, in terms of human, financial and physical capacities for effective monitoring, reporting and verification in the implementation of multilateral environmental agreements related to forestry and climate change, as well as the extent of participation of women, youth and vulnerable groups in forest based climate change response actions and how these could be enhanced.

All countries in West Africa are parties to the UNFCCC and the Kyoto Protocol. All, except Liberia, have submitted their Initial/First National Communication and 11 of them have submitted the Second National Communication. All 15 Least Developed Countries (LDCs) in the sub-region have submitted NAPAs and two of the non-LDCs have elaborated national adaptation strategies with implementation plans. Only six of the countries have responded to the Copenhagen Accord requirement for submission of Nationally Appropriate Mitigation Actions (NAMAs). Common constraints to implementation of the plans are shortage of funds and human resources, poor knowledge base and institutional bottlenecks. For many countries the involvement of forestry is not explicitly highlighted in their climate change response plans. Along with harnessing external support to improve financial and technical capacity, and applying the funds gained to building human (by education and training), research and institutional capacities, recognition of the role of forestry, and investment to strengthen this role will have a widespread positive influence in achieving the goals of many of the listed climate change response measures in the sub-region.

Only Burkina Faso and Senegal have good forest inventory capacity. Niger has some, but the rest of the countries have limited or very low forest inventory capacities Also, the majority (12 out of 18) of the countries studied have very low forest area monitoring capacities, as judged by shortcomings in consistency, transparency, comparability, completeness and accuracy of reports they have returned to bodies such as FAO, UNFCCC and the World Bank. Most (11) of the countries with low forest area monitoring capacity are among the LDCs. It is suggested that the low capacities observed partly reflect a long tradition of neglect of inventory, monitoring and reporting in forest practice in most African countries, including the West African countries studied. The capacity building required to

overcome this is not just in terms of skills, tools and facilities, but also in terms of national re-orientation, and particularly of the forestry services.

Except in countries where cultural norms restrict women from taking part in field activities, women, youth and the poor traditionally participate actively in forestry activities, including those done in response to climate change, e.g. nursery work, planting tree seedlings, watering and tending seedlings as well as monitoring agroforestry practices and protecting naturally regenerated seedlings. Women and youth also dominate in collecting, processing and marketing non-timber forest products (NTFPs). To increase the roles and benefits to women, youth and vulnerable groups in forest-based climate change response programmes, emphasis should be given to developing NTFP-based enterprises into a viable commercial industry sector that can take advantage of international market opportunities. Designing the emerging REDD+ mechanism to accommodate such a development, accompanied with policy reforms to address constraints to women's participation in forestry, such as restricted land and tree tenure rights, poor representation of women in important decision-making structures and poor access to information, will help to sustain the increase in participation and benefits to women from forest-based responses to climate change.

Arising from the findings of this study, critical areas for further attention by AFF would be:

- to conduct a more detailed assessment than was feasible in the present study, to identify specific forestry interventions, and how to implement them, in the priority NAPA projects and climate change response strategies and actions developed by West African countries, with a view to recommending such interventions to the relevant countries;
- to organise a programme of sensitisation, re-orientation and training of West African countries on the importance of forest inventory, monitoring, reporting and verification of forest cover changes in implementing sustainable forest management and forest-based responses to climate change; and,
- to initiate and promote research into the development of NTFP-based enterprises into a viable commercial industry sector dominated by women and youth and linked with the implementation of forest-based climate change responses such as the REDD mechanism or in NAMAs in West Africa countries.

Introduction

This publication is based on a report of a study commissioned by the African Forest Forum (AFF). The backgrounds to the study are:

- the concern that climate change is now a major threat to achieving the development aspirations of many African countries, especially for poverty reduction and attaining the MDGs;
- the realisation that while climate change impacts on forests, forests in turn play a key role in adaptation, and have a potential to contribute significantly to mitigation of climate change;
- the knowledge that issues of climate change-forest relationships are growing in importance on the agenda in global debates on action against climate change;
- the desire to strengthen the capacities of SSA countries, which are expected to face significant impacts from climate change, in using their forests and trees to adapt to, and mitigate the adverse effects of climate change; and
- AFF's desire to improve its understanding of how forests and trees, and the people who depend on them, respond to climate change and variability, in order to strengthen its capacity to promote advocacy and offer advice on relevant policy and technical forest and climate change issues.

The study was conducted under the Forests, People and Climate Change Project of AFF. It was essentially a desk study, based on extant literature mostly from the internet, supplemented with the results from an on-line survey using a limited questionnaire administered on key stakeholders from the studied West African countries. The study focused mainly on the country National Adaptation Plans of Action (NAPAs), National Appropriate Mitigation Actions (NAMAs) and National Communications to the UNFCCC, evaluating these against the UNFCCC guidelines for preparing them, and sought to identify gaps and factors influencing the implementation of the instruments and how these could be filled through forestry and forestry-related interventions. The study also examined the profiles and capacities of public forest administrations in West African countries, in terms of human, financial and physical capacities for effective monitoring, reporting and verification in implementing multilateral environmental agreements related to forestry and climate change, as well as the extent of participation of women, youth and vulnerable groups in forest based climate change response actions and how these could be enhanced.

The findings presented below are organised by country for the review of the national climate change instruments and for the profiling of country capacities for MRV. The role of women,

youth and vulnerable groups and how this could be enhanced in forest-based climate change response actions are each reported as a whole for the sub-region.

CHAPTER 1 Review and evaluation of National Adaptation Plans of Action (NAPAs), Nationally Appropriate Mitigation Actions (NAMAs) and other national plans and programmes on climate change

REPUBLIC OF BENIN

Overview

The Republic of Benin has a two-peak rainy season, April to July and September to November, and a dry season that lasts from November to March and is marked by the Harmattan. Sub-Sahelian conditions exist in the northern part of the country, beyond Latitude 8° 30' North. The main impacts of climate change as reported in the Second National Communication to UNFCCC are irregularity in the seasons, floods and droughts. No primary forest remains in Benin. Forest cover loss between 1990 and 2010 occurred at a rate of 1.04% per year, so that 20.8% of the country's forest cover was lost over that period (FAO, 2010). The Republic of Benin ratified the UNFCCC and the Kyoto Protocol in 1994 and 2002, respectively. It submitted its 2nd National Communication in 2011, having posted its NAPA in 2008. The evaluation below is based on the submissions, especially the NAPA.

Evaluation

The Least Developed Countries Expert Group (LEG) guidelines were closely followed in preparing the NAPA so that preparations were participatory and integrated into existing policies and programmes. The goal of NAPA is to coordinate the implementation of adaptation to climate change activities, to reinforce and maximise synergy with different programmes on environment, through a participatory, community-based multi-disciplinary approach. Criteria for selecting priority activities included contribution to resolution of urgent and immediate problems of adaptation to climate change, contribution to reduction of poverty of vulnerable groups, project sustainability, effectiveness and numerical size of benefitting population. Of the five priority activities defined (Table 1), the projects on renewable energy development, surface water conservation and coastal zone restoration may have significant forestry contents.

Table 1. Priority projects, by sectors, identified in the NAPA of Benin

Sector	Project title	General objective
Agriculture and Food Security	Establishment of a system of forecast of climatic risks and rapid alert for food security in 4 vulnerable agro-ecological zones.	Make available to agricultural practitioners and communities notices and alerts in the case of significant meteorological and climatic events that may be damaging to the production system.
Energy	Adaptation of households to climate change by the promotion of renewable energies and efficient economic stoves and pressure-cookers in zones vulnerable to climate change and where soils are strongly degraded.	Reduce the vulnerability of populations to effects induced by climate change by the improvement of access to sources of renewable energy and safeguarding of forest resources.
Water Resources	Harvesting of surface water with the aim of adaptation to climate change in the most vulnerable Municipal Councils of the Central and Northern departments.	Reinforce the availability of water during dry periods with the aim of adapting the population to climate change.
Health	Protection of children under 5 years and pregnant women from malaria in the zones most vulnerable to climate change.	Contribute to the reduction of morbidity and mortality linked to malaria in Benin.
Coastal Zone	Protection of the coastal zone against the rising level of the sea.	Correct sedimentary imbalance, receding beach, restore mangrove and promote an improved technology for the extraction of salt by combined solar and wind energy.

Implementation gaps

Identified constraints to the implementation of NAPA are lack of financial resources, need to modify meteorological stations, inadequate human resources, administrative bottlenecks, socio-cultural impediments, low level of literacy and inadequacy of reliable data. Massive injection of funds from external and internal sources, technical assistance with meteorological data collection, training, strong monitoring and evaluation and enhanced research are needed to overcome the identified gaps. Spelling out the roles of forestry and intervening with appropriate forestry strategies will facilitate implementation of the renewable energy development, surface water conservation and coastal zone mangrove restoration options in the priority projects.

BURKINA FASO

Overview

The northern third of Burkina Faso is Sahelian with less than 600 mm annual rainfall, the middle is north Sudanian (600 mm - 900 mm annual rainfall) and the southern third is south Sudanian with more than 900 mm annual rainfall. Climate change accentuates the impact of intense anthropogenic factors on the biophysical environment. In the past four decades, extreme weather events, droughts, floods, sand storms, and temperature peaks have become more frequent and intense, resulting in degradation of the environment. Between 1980 and 2000 forest cover decreased from 15.4 million ha to 11.3 million ha. Burkina Faso ratified the UNFCCC and the Kyoto Protocol in 1993 and 2005, respectively. It submitted its Initial National Communication in 2002 and a NAPA in 2007. The evaluation below draws largely from the NAPA.

Evaluation

Burkina Faso's NAPA was written to be consistent with the country's development objectives, such as the strategy to fight against poverty (CSLP), the strategy for rural development (SDR), the National Plan for Fight against Poverty (PNLCD), the National Policy on Environment, the Environmental Plan for Sustainable Development (PEDD), the National Forestry Policy, and the Millennium Development Goals. LEG guidelines were followed in developing it and rigorous criteria were used to identify 12 priority projects (*Table 2*), of which Project 5 on rational management of natural resources and valuing of NTFPs is the most forestry-related. Project 6 on fight against siltation, Project 10 on management of faunal habitat and Project 11 on protection of surface and underground water sources may also have significant forestry implications.

Table 2. List of priority projects identified in Burkina Faso's NAPA

1. Reduction of vulnerability to climatic change by the reinforcement of plan of action for the prevention and management of food crises.
2. Securing production of cereals through the promotion of additional irrigation. Zones of intervention: northern regions (province of Oudalan and North-central province of Namentenga).
3. Establishment and management of the Oursi pond.
4. Forage production and establishment of security stocks for livestock in the Sahel zone.
5. Establishment, rational management or use of natural formations (structures), valuing of Non-Timber Forest Products in the Eastern region of Burkina.
6. Fight against siltation of watercourses in the national basins of Mouhoun, Nakanbé and Comoé.
7. Development of irrigated farms in the provinces of Gourma, Namentenga, Tapoa and Sanmatnga.
8. Securing the zones for pastoralists in the regions of Sahel and of the East.
9. Securing agricultural production by utilising appropriate technological packages in the South-West and Eastern regions.
10. Promotion of the management of the fauna and its habitat by rural communities in the Mouhoun region.
11. Establishment of areas and devices of protection against pollution of works capturing underground and surface water (lakes, wells, boreholes) in the cotton-production basins of Burkina Faso (Mouhoun, South-West, Comoe, and Eastern part of Nakanbe).
12. Promotion of equipments with energy economy (better households) and of renewable energy technologies (pressure cooker, water heater, and solar driers, etc.).

Implementation gaps

Production from land in the Sahel-Sudan ecozone of Burkina Faso is essentially agro-forestry based. In addition to the generic constraints of finance, paucity of technical data, administrative and institutional bottlenecks, and inadequacy of human resources, implementation of NAPA in Burkina Faso is likely to be specially constrained by the extreme poverty of the country. Burkina Faso is 175th out of 177 countries in UNDP's ranking of poverty. Emphasis on high-value multipurpose trees in the essentially agro-forestry practices of land use should greatly assist in overcoming the poverty constraint. There is room for creative forestry interventions in Projects 5, 6, 10 and 11 to enhance prospects for achieving the objectives of Burkina Faso's NAPA.

CAPE VERDE

Overview

One reported impact of climate change on Cape Verde is the shortening of its rainy season from four (July to October) to two (August and September) months since the 1960s. Climate change impacts on its coastal regions also threaten the tourism industry of the country. Cape Verde ratified the UNFCCC in 1995 and the Kyoto Protocol in 2005. It submitted its First National Communication along with a National Strategy and Action Plan on Climate Change in 2000, and has since followed these with its Second National Communication in 2010. As an LDC it submitted its NAPA, covering the period 2008 -2012, in 2007. Evidence of submission of NAMA was not seen, but the 2nd National Communication outlines measures to reduce greenhouse gas emission from the energy, construction, transport and industry sectors. The evaluation below is mainly of the NAPA. Up to 21% of Cape Verde is forested, mostly with planted forests (FAO, 2009; FAO, 2010).

Evaluation

The preparation of Cape Verde's NAPA followed the UNFCCC guidelines. It was participatory, multi-disciplinary in approach and targeted at achieving sustainable development. On-going improvement in governance in the country encouraging a democratic culture and widening the space for participation of citizens in public management may have facilitated this. The NAPA complements existing programmes such as those described in the Growth and Poverty Reduction Strategy Paper (GPRSP), the Programme of Fight against Poverty (PFAP), the National Environmental Action Plan (NEAP) and the Second National Environmental Programme of Action (PANA II). The process used in selecting priority activities also shows that preparation of the NAPA was country driven. The country NAPA team went beyond the given guidelines to add a number of beneficiaries to an action as a criterion. The overall goal of Cape Verde’s NAPA is to 'Increase the Capacity of Cape Verde to Resist Climate Change and Variability'. The strategic goals are:

- promoting integrated water resources management;
- developing the adaptability of the agro-silvo-pastoral production systems; and
- protecting and preventing degradation of the coastal areas.

Priority projects corresponding respectively to the strategic objectives are:

- mobilisation and integrated water resources management;
- modernisation and diversification of agricultural production for food security improvement; and

- integrated protection and management of the Coastal Zones.

Only activities in Projects 2 and 3 have significant opportunities for improvement through forestry intervention (Table 3).

Table 3. Activities with significant opportunities for forestry interventions in Priority Projects 2 and 3 of Cape Verde's NAPA

Project 2. Mobilisation and diversification of agricultural production for food security improvement
• Intensification and diversification of production of vegetable and fruits crops through the introduction of more adapted crops; • Support to the practice of vegetable and fruit crop production in pluvial zones, using drip irrigation; • Creation of a rotating fund (micro-credit) for financing income generating activities based essentially on the valuation and the rational management of natural resources; • Promotion of the use of plant species sisal (*Agave sisalana*), «Barnelo» (*Grewia villosa),* bamboo (*Bambusa vulgaris*) and caniço (*Arundo donax)* against soil erosion (formation of shrub barriers) and utilisation of those species for valorisation of national handicrafts. • Promotion of knowledge and traditional practices of adaptation of agro-silvo-pastoral production systems to climate change;
Project 3. Integrated protection and management of coastal zones
• Anti-erosive fight along the coasts through construction of channels, reforestation, fight against deforestation and exploration of inert materials, among others.

Implementation gaps

Factors likely to influence implementation of the NAPA and other climate change programmes are inadequacy of information, poor institutional support, inadequate financial resources and, for the priority projects involving forestry, inadequate human resources. There was only 27 professional staff in public forest institutions in 2008 of which 30% was female. Enhanced financial support for recruitment and training of forestry personnel will help to close the human resource gap and facilitate expanded agro-forestry activities for implementation of NAPA Priority Project 2 - Modernisation and Diversification of Agricultural Production. Forestry interventions could be by the identification of suitable fruit trees for intensification and diversification of fruit crops production, reforestation and planting with effective woody plants to enhance erosion control and promoting sustainable forest

management to maintain forest cover against erosion while yielding products for handicraft production and income enhancement.

CHAD

Overview

The bioclimatic regions of Chad are Sahara to the north, occupying up to 60% of the country's land area, with less than 200 mm/year rainfall, Sahel (rainfall 200-800 mm/year) in the middle characterised by frequent drought periods and loss of surface water, and Sudanian (rainfall 800-1200 mm/year) in the south that is exposed to frequent extreme weather events such as intense rainfall of short duration. Chad is highly vulnerable and has a low adaptive capacity to climate change, which negatively impacts on the agricultural, forestry, fishery and pastoral activities that are the main sources of income of the people. Chad ratified the UNFCCC in 1994 and the Kyoto Protocol in 2009. It submitted its Initial National Communication in 2001 and a NAPA in 2010. The evaluation below is based mainly on these submissions. According to FAO (2010), 9.2 % of Chad is forested. The country lost 12.1% of its forest cover between 1990 and 2010. Up to 9.0% of Chad is protected area under IUCN categories 1-V. (UNEP-WCMC, 2004).

Evaluation

Preparation of Chad's NAPA closely followed LEG guidelines. It is integrated into the national development plans and followed a participatory process to establish rigorous criteria for the identification of 10 priority projects (Table 4). Four of the projects are agricultural (1, 2, 3 & 5), three are cross-sectorial (4, 7 & 8), two livestock (6 & 9) and one institutional (10). Trees are a crucial factor in the productive bioclimatic regions of the country, where essentially agro-forestry practices are used in both crop and livestock farming. Collection of NWFPs is also important in the very arid regions. Though none of the priority NAPA projects is labelled as forestry, improvement in agro-forestry practice can be a significant factor in realising the NAPA objectives.

Table 4. Priority projects identified in NAPA of Chad Republic

1. Mobilisation of surface water for agriculture and feeding of livestock.
2. Diversification and intensification of farming in the Sudan and Sahel zones.
3. Improvement and popularisation of farming calendars.
4. Improvement of information, education and communication on adaptation to climate change.
5. Realisation of works of defence and restoration of soils for the development of agricultural activities.
6. Improvement of zones of inter-community grazing or pasture.
7. Improvement of the quality of seasonal forecast and its integration into the strategy for following up on vulnerability (localisation: national territory).
8. National Observatory on Climate Change (NOCC).
9. Feeding banks for livestock.
10. Reduction of vulnerability of populations to climate change climate change/management of risks linked to climate and to adaptation to climate change.

Implementation gaps

Obstacles identified in the NAPA document as potential barriers to implementation include weak policy framework, inadequate knowledge in the context of implementing the NAPA projects, and institutional, financial, social, economic and cultural problems. Suggested solutions to the above include an adequate consultative and participatory approach, a multidisciplinary and transparent approach based on intervention by qualified people in the process, and an approach that takes full account of existing national plans and programmes and other multilateral environmental agreements. Enhanced use of improved agro-forestry and water management practices will also greatly help in realising the aims of the NAPA.

THE GAMBIA

Overview

The Gambia experiences a long dry season (November to May) with a short rainy period (June to October). Models projections indicate a temperature increase of 3-4.5° C by 2075 and rainfall increasing by 15-29% above the average for 1951-1990 by 2100. The country is an LDC, party to UNFCCC. Its first National Communication submitted in 2003 shows that climate change will impact mostly negatively on its dominantly agrarian economy. The Gambia submitted a NAPA in 2007 and a NAMA brief in 2012. The evaluation below is

based on these documents, using mainly the NAPA. Up to 48% of Gambia is forested, but no area is under protection as IUCN categories I-V (UNEP-WCMC, 2004).

Evaluation

The LDC's Expert Group (LEG) guidelines were strictly followed in developing the Gambia's NAPA. With a core multi-disciplinary NAPA Country Team of 13 individuals, over 75 stakeholders, including technicians and scientists from different backgrounds and disciplines, CBOs, NGOs and grassroots level communities, participated in studies, analyses, consultations, syntheses and reviews in preparation of the document. Gambia's climate change documents are integrated into the country's environmental management plan (GEAP) and the poverty reduction programme (PRSP), the MDGs and especially the Vision 2020 Long Term Development Strategy, planned to be executed in a series of five-year steps. The current Programme for Accelerated Growth and Employment (PAGE) runs from 2012 to 2015. The strategic goals of the Gambia's NAPA are to:

i) achieve significant reduction in the degree of exposure and/or sensitivity of natural systems to climate change; and

ii) increase the resilience of impacted communities/systems.

It is planned to achieve these goals through cross-linked strategies that emphasise participatory planning, implementation and monitoring, through:

a) mobilisation and timely availability of funds;

b) mainstreaming of policy linkages; and,

c) capacity building and sectorial linkages.

Up to 24 criteria, clustered as economic, environmental, political, social and technical were used in identifying 10 priority projects. No detailed cost-benefit analysis was conducted due to inadequate capacity. Of the ten identified projects (*Table 5*), only two (4 and 5) directly relate to forestry. Details of the activities in the two projects are given in Table 6.

Table 5. Priority projects identified in NAPA of the Gambia

1. Rehabilitation of early warning systems on climate-related natural hazards.
2. Improvement of fresh water availability.
3. Diversification and intensification of agricultural production, processing, and marketing.
4. Expansion of community participation in the management of forests and protected areas.
5. Expansion and intensification of agro-forestry and reforestation activities.
6. Briquetting and carbonization of groundnut shells.
7. Reduction of climate change related diseases.
8. Improved livestock and rangeland management for food security and environmental sustainability.
9. Restoration/protection of coastal environments.
10. Increasing fish production through aquaculture and conservation of post-harvest fishery products.

Table 6. Details of activities in priority Projects 4 and 5 of the Gambia's NAPA

Project 4: Expansion of community participation in the management of forests and protected areas
• Surveying and demarcation of three target community forests. • Development of three management plans. • Establishment of district nurseries. • Production of seedlings. • Training of villagers in tree nursery production (budding and grafting techniques, methods of transplanting tree seedlings and forestry management principles). • Equipping each of the participating communities/villages (3) with patrol and bushfire fighting equipment. • Provision of boreholes fitted with appropriate water lifting devices (2). • Strengthening the forestry extension and M&E units and some selected NGOs and CBOs.
Project 5: Expansion and intensification of agro-forestry and reforestation activities
• Sensitisation and awareness creation campaigns. • Diagnostic study of the technical problems for agroforestry in the region. • Establishment of nurseries for the production of multipurpose tree species domestication and re-forestation. • Training of villagers in tree nursery production (budding and grafting techniques, methods of trans-planting tree seedlings and forestry management principles). • Equipping each of the participating communities/villages with patrol and bushfire fighting equipment. • Provision of boreholes fitted with appropriate water lifting devices. • Surveying and demarcation of the target forests (reforestation). • Strengthening the agro-forestry research programme of the National Agricultural Research Institute (NARI), the extension and M&E units of the Department of Forestry at local level, and some selected NGOs and CBOs.

Implementation gaps

Factors identified as likely to influence implementation of the NAPA include external debt burden and internal financial, organisational, cultural and natural resources constraints. Of the ten priority projects elaborated, those on expansion of community participation in the management of forests and protected areas, and those on expansion and intensification of agro-forestry and reforestation activities, are most relevant to forestry. Constraints to implementing these activities can be overcome by enhancing the capacities of forestry personnel and local communities in forest management through training and adequate funding. A strong monitoring, reporting and evaluation framework will greatly reduce the overarching internal constraints. Projects 2, 3, 8 and 10 can benefit from forestry interventions to promote watershed or catchment areas management for enhanced water supply (2), develop agro-forestry systems to support agricultural production (3), support rangeland management (8) and contribute to sustainable supply of wood for fish smoking (10).

GHANA

Overview

Ghana is vulnerable to climate change manifestations such as increasing temperature, variable and unreliable rainfall patterns, sea-level rise and extreme weather events like flooding, droughts and ocean surges. Analysis of 1960-2000 data shows rising temperatures. It is estimated that temperatures will continue to rise on the average by 0.6 °C, 2.0 °C and 3.9 °C by the years 2020, 2050, and 2080 respectively. Rainfall is projected to decrease on average by 2.8%, 10.9% and 18.6% by 2020, 2050 and 2080 respectively. Increasing aridity may lead to reduction in groundwater recharge by up to 40% by 2050. Up to 21.7% of the land area of Ghana is forested (FAO, 2010), and 8.0% of this is classified as primary forest, which is the most bio-diverse and carbon dense type of forest. Up to 4.6% of Ghana's forest is protected area under IUCN categories I-V. Ghana ratified the UNFCCC in 1995 and acceded to the Kyoto Protocol in 2003, having submitted its Initial National Communication (INC) in 2000. The Second National Communication (SNC) was submitted in 2011, other notable initiatives to address climate change being the preparation of a National Climate Change Adaptation Strategy (NCCAS), submission of a list of 55 Nationally Appropriate Mitigation Actions (NAMAs) and the preparation of a National Climate Change Policy Framework (NCCPF) designed as a major contribution to the country's main development programme, Ghana Shared Growth Development Agenda (GSGDA). Relevant sections of the above instruments are evaluated below.

Evaluation

The National Communications, NCCAS, NAMAs and National Climate Change Policy Framework reflect a strong commitment to address climate change in the context of Ghana's development aspirations. Preparation of the documents appears also to have been highly participatory and multidisciplinary judging by the number and backgrounds of the people listed as having taken part. The Initial National Communication identified a wide range of forest protection and reforestation measures for abating climate change. This is confirmed by the NAMA list that includes promotion of sustainable forest management and rehabilitation of degraded forest land as appropriate mitigation actions. The Second National Communication consolidates the role of forestry by highlighting the REDD mechanism as the main forestry activity for addressing climate change. REDD is emphasised in Ghana's climate change governance as 'it has been identified as a major strategy for facilitating low carbon development as well as building resilient climate change adaptation'. Ghana is thus participating in the Forest Carbon Partnership Facility supported by the World Bank, through which it has developed its REDD Readiness Plan, aimed at preparing the country for implementation of the mechanism. It entails preparing the country for dealing with issues of stakeholder consultation and participation, setting reference scenarios, monitoring, reporting and verification, and financial management.

Implementation gaps

Implementation of the forestry-based measures (sustainable forest management, rehabilitation of degraded forest land by afforestation and reforestation, and avoidance of deforestation in REDD) will be constrained by the factors already identified in the FOSA Country Report for Ghana - lack of adequate resources, inefficient personnel drive, ineffective management and lack of skilled labour. Underlying these are inadequate finance, inadequate knowledge of the resource base and its behaviour, and institutional and human capacity inadequacies. These constraints can be alleviated by securing external support from international opportunities, as Ghana has done with the Forest Carbon Partnership Facility. Enhanced budgetary allocation will help to build the necessary research, institutional and human capacities to fill the gaps and overcome the constraints.

GUINEA-BISSAU

Overview

Guinea-Bissau is divided into a coastal region with a humid tropical climate (annual rainfall up to 2500 mm/year) and a continental zone with a Sudanian climate (1200-1500 mm/year). The country is thus exposed to the coastal impacts of climate change through to impacts in humid and semi-arid areas, with adverse effects on the dominant rain-fed agrarian economy, as well as on the fisheries and tourism industries. The coastal zone also has an

archipelago of 88 islands placing the country in the group of Small Island Developing States (SIDS) with regard to climate change negotiations. According to FAO (2010), 72% of Guinea-Bissau is forested. The country lost 8.8% (194 000 ha) of its forest cover between 1990 and 2010. No area is protected under IUCN categories I-V. It ratified the UNFCCC in 1995 and the Tokyo Protocol in 2006. The same year it submitted a NAPA. The Initial National Communication was submitted in 2004 and the 2nd was submitted in 2011. The evaluation below is based on these submissions, especially the NAPA.

Evaluation

The LDC's Expert Group (LEG) guidelines were closely followed in preparing Guinea-Bissau's NAPA, so the preparation was participatory and multi-disciplinary with ample consultation of key stakeholders. Moreover, the NAPA was designed to integrate environmental dimensions into sector strategies for the fight against poverty and national development. A rigorous process was followed to identify 14 priority projects for the NAPA (Table 7). Given the stated background of accelerated destruction of forests, estimated at 30 000-60 000 ha/year, with negative effects on biodiversity and sequestration capacity estimated at 11.3 million tCO_2, it is surprising that activities to reduce deforestation do not feature in the priority projects. Forestry is marginally involved in projects to protect mangroves with rice fields or under the rubric of diversification of food production and is the main activity in Project 14.

Table 7. Priority projects identified in Guinea-Bissau's NAPA

1. Support to diversification of production and food diet.
2. Improvement of water supply in rural zones.
3. Capacity building in prevention and protection of mangrove *Bolanhus* against high-tide invasion.
4. Observatory for mangrove monitoring and evaluation.
5. Monitoring of coastal area erosion.
6. Assessment of impacts of climate change on producer sectors.
7. Promotion of small-scale irrigation in Geba and Corubal Rivers.
8. Prevention of natural catastrophes.
9. Protection, conservation and enhancement of fishing and coastal resources.
10. Integrated system of information on food security.
11. Environmental education and communication in coastal areas.
12. Rehabilitation of small perimeters of mangrove soils for rice growing in Tombali, Quinara, Bafata and Oio.
13. Support to production of short-cycle animals.
14. Reforesting of degraded areas.

Implementation gaps

In addition to generic constraints arising from the country being among the poorest in the world (173rd out of 177 countries according to UNDP ranking), a major gap in implementation of the NAPA is the non-inclusion of action to stem deforestation. This can be remedied by the country's adoption of the REDD mechanism. The country already acknowledges its reliance on bilateral and multilateral sources of financial and technical assistance to implement NAPA. Forestry can also intervene to improve the chances of realising the NAPA goals by introducing agroforestry practices for enhancing food production (project 1) and in designing effective programmes for the reforestation of degraded lands envisaged in project 14.

GUINEA CONAKRY

Overview

Reduced rainfall, recurrent droughts since 1970, flash floods and irregular rainfall patterns are the major climate change impacts in Guinea Conakry, with adverse consequences for the economy which is largely dependent on rain-fed agriculture. About 26.6% of Guinea Conakry is forested (FAO, 2010). Of this, 1% is classified as primary forest. The rate of forest cover loss between 1990 and 2010 was 0.5% per annum, so c. 10% of the forest cover was lost over that period. Guinea Conakry is rich in biodiversity with over 990 species of amphibians, birds, mammals and reptiles, 0.6% of which are endemic. There are more than 3 000 species of vascular plants, of which 2.9% are endemic. Protected areas in IUCN categories I-V cover only 0.2% of the land area (UNEP-WCMC, 2004). Guinea Conakry ratified the UNFCCC and the Kyoto Protocol in 1993 and 2000, respectively. It submitted its Initial National Communication in 2002 and a NAPA in 2007. The evaluation below is based mainly on the NAPA.

Evaluation

Judging by the list of the preparatory team, development of Guinea Conakry's NAPA followed the LEG guidelines in being multidisciplinary and participatory. The programme was designed to be consistent with on-going programmes to combat poverty and environmental degradation, improve agriculture and livestock production, the Forest Policy and programmes on reducing risks to the country's biodiversity resources. It is designed to implement the programme through effective participation of the beneficiaries, especially local communities, supported by technical services and government organisations. A rigorous process was followed to select 25 priority projects (Table 8).

Table 8. Priority projects identified in Guinea Conakry's NAPA

1. Supporting the development of community and private plantations of cashew-nut trees.
2. Supporting the elaboration of a working plan for the management of community forests.
3. Valorisation of positive endogenous (local) knowledge and practices.
4. Introduction of the coastal people to the technique of the rearing of mangrove oysters.
5. Promotion of anti-erosion practices for the protection of soils.
6. Promotion of solar drying of fish with in view of reducing the impacts of smoke-culture on the mangroves.
7. Promotion of use of bricks from solidified soils with the aim of reducing the environmental impacts of fired bricks.
8. Intensification of the commercial farming of cereals in the northern zone of Guinea.
9. Promotion of the utilisation of solar energy in the extraction of marine salt.
10. Promotion of wire-netting and live hedge enclosures (walls).
11. Elaboration of an early warning system.
12. Promotion fire management and the readiness for guarding against it.
13. Protection of the coastal farming zones.
14. Spread of multinational agreements on the environment (AME) and national legal documents related to the protection and utilisation of natural resources.
15. Promotion of environmental education for coastal communities.
16. Realisation of multiple-purposes micro-dams.
17. Creation of runoff water retention basins
18. Realisation of improved wells.
19. Making surface water potable by hydro-purification.
20. Protection of fresh zones.
21. Construction of impluviums.
22. Development of irrigated rice farming in the northern zone of Guinea.
23. Promotion of the rearing of small ruminants.
24. Promotion of market gardening.
25. Creation of grasscutter breeding farms.

Implementation gaps

Identified obstacles to NAPA implementation include difficulties with mobilising resources in the face of a difficult macro-economic situation, weak institutional capacity and natural constraints. Adoption of the REDD mechanism will help to ameliorate these obstacles. In

addition, agroforestry and community based forest management approaches can be deployed to enhance the chances of successful realisation of the objectives of Projects 1 (establishing cashew nut plantations), 2 (management of community forests), 5 (establishing anti-erosion practices for protection of soils), 8 (commercial cereal farming) and 24 (promotion of market gardens). Closer studies will be needed to determine the appropriate forestry package for each project.

IVORY COAST

Overview

The predominantly agrarian economy of Ivory Coast, which depends on rain-fed agriculture, is highly vulnerable to climate change that exacerbates the impact of human pressure on the land. Until quite recently, Ivory Coast recorded one of the highest rates of deforestation in the world (500 000 ha/year) (Reed, 1992; Okali, 1995), mainly caused by rapid conversion of closed forest for coffee and cocoa production, as well as from timber exploitation. FAO (2010) data, however, show that 32.7% of Ivory Coast is still forested, and about 6% of this is classified as primary forest. Forest cover expanded by about 1.8% between 2000 and 2005, but taken together with changes in woodland area, there was a loss of 0.4% of forest between 1990 and 2005. The forests are rich in biodiversity, 1.7% of the vascular plant species and 1.2% of the amphibians, birds, mammals and reptiles are endemic. Protected areas under IUCN categories I-V amount to 6.1% of the land area. The country ratified the UNFCCC in 1994 and the Kyoto Protocol in 2007. It submitted its Initial National Communication in 2001, the Second National Communication in 2010 and a '*note verbale*' on NAMA in 2010. The evaluation below is based on the submissions.

Evaluation

Ivory Coast ranks forestry and forest-related measures high in its plans to respond to climate change. For example, forestry sector measures highlighted in the Initial National Communication include:

- curbing deforestation by instituting and implementing an act to improve the security of land ownership, which is very relevant for meeting criteria required for participation in forest-based mechanisms, such as Afforestation and Reforestation (A/R) under the Clean Development Mechanism (CDM) of the Kyoto Protocol, and REDD;
- learning from the successful system of preserving sacred forests to improve the management and protection of reserved forests;
- raising the level of education of the rural communities who are the custodians of forests;
- instituting a requirement for land allottees to replant degraded forests;

- increasing alternative sources of domestic energy supply to reduce the pressure on forests for fuelwood by intensifying agroforestry and planting of greenbelts around urban centres.

It is estimated that energy plantations developed around urban areas in the south could sequester up to 900 tC/ha. Forestry sector measures highlighted in the '*note verbale*' on NAMA include reconstitution and sustainable management of the permanent forest estate, and using forests to promote soil and water conservation. It is noted that the climate change response plans of Ivory Coast were developed through multi-disciplinary and participatory approaches respecting national developmental priorities such as the National Environmental Action Plan (NEAP), the Sustainable National Development Strategy (SNDD) based on achieving the MDGs and strategies for implementing the biodiversity and desertification multilateral environmental agreements, CBD and CCD, respectively.

Implementation gaps

The climate response plans of Ivory Coast acknowledge lack of financial and human resources as constraints to implementing the plans. Harnessing external sources of funds and applying these to developing the human resources, including training and re-orientation of forest personnel towards partnerships in managing the forest resources, filling in gaps in the knowledge base especially in the forestry sector and allocating more funds to the forestry service to enable it perform its functions, should help in overcoming the constraints. Forestry management should expand its focus on community-based initiatives, to reduce costs and improve the security of the forest resource.

LIBERIA

Overview

Climate change threatens the key economic sectors of agriculture, fisheries, forestry, energy and health. Identified contributing factors to Liberia's susceptibility to adverse effects of climate change are ill-adapted agricultural activities, unsustainable logging practices, unregulated coasting sand mining, overdependence on biomass, inadequate infrastructure, low level of socio-economic development, low institutional capacity and inadequate meteorological and hydrological data and data gathering capability. According to FAO (2010), 44.9% of the land area of Liberia is forested, with 4% of the forest being classified as primary. The country lost12.2% of its forest cover between 1990 and 2010, and 1.3% of the land area is protected under IUCN categories I-V. Liberia acceded to both the UNFCCC and the Kyoto Protocol in 2002. As a Least Developed Country, Liberia submitted its NAPA in 2008. The country is currently working to finalise its Initial National Communication (INC), conclude transactions for support from the Forest Carbon Partnership Facility of the World Bank for a REDD Readiness Preparation Project, and assistance from the UNDP for a study

to identify barriers, gaps and needs for successful development of Low Emission Development strategies (LEDS), NAMAs and MRV systems. The evaluation below deals with the NAPA.

Evaluation

Preparation of Liberia's NAPA strictly followed LEG guidelines. It was driven by a National Steering Committee of 22 members of various backgrounds and disciplines, and developed in concert with the vulnerable communities through extensive consultations, workshops and meetings. An elaborate system of criteria was established and used in selecting three top priority projects (Table 9), only two of which can be stretched to involve forestry – diversification of crop cultivation and small ruminants rearing (through agro-forestry) and reducing the vulnerability of coastal areas to erosion, floods, siltation and degraded landscapes (through social, protection and restoration forestry). The NAPA is designed to be consistent with ongoing national strategies, plans and frameworks, especially the National Environmental Policy and the National Reconstruction Development Plan (NRDP).

Table 9. Priority projects and activities identified in Liberia's NAPA

Project 1. Enhancing resilience to increasing rainfall variability through the diversification of crop cultivation and small ruminants rearing (agriculture).
▸ Incorporate project staff and relevant stakeholders. ▸ Identify and recruit extension agents to provide technical backstopping in existing agricultural zones. ▸ Introduce and popularise lowland farming methods as a way of reducing pressure on forest cover or vegetation. ▸ Provide crop varieties and improved breeds of livestock and medication. ▸ Provide requisite inputs to enhance project objectives.
Project 2. Enhancing adaptive capacity through the rebuilding of the national hydro-meteorological monitoring system and improved networking for the measurement of climatic parameters.
▸ Rehabilitate existing hydro-meteorological stations. ▸ Establish hydrometric networks at river basins. ▸ Acquire materials and equipment. ▸ Conduct a training programme for hydro-metrological personnel. ▸ Provide public awareness.
Project 3. Reducing the vulnerability of coastal urban areas (Monrovia, Buchanan) to erosion, floods, siltation and degraded landscapes.
▸ Constructa Groyne System in Monrovia (Mamba Point, West Point and New Kru Town). ▸ Construct a Break Water System in Buchanan (Walvis Bay, Robert Street and Port of Buchanan).

Implementation gaps

Top on the list of identified barriers to implementing NAPA is a consequence of the recent conflict in the country. The administrative, political and informational frameworks necessary for integrating NAPA into national development action are still being reconstructed. Low institutional and human capacity, inadequate funding, pervasive poverty and very poor infrastructure (roads, telecommunication and sanitation) are specific barriers. Unsustainable logging, mining and farming practices further compound the challenges. Injection of massive assistance from external sources, such as the UNFCCC financing mechanisms and time are needed to overcome these barriers. The country is already negotiating such assistance for REDD and NAMA activities. Activity (iii) in Project 1 can benefit from forestry intervention to put in place appropriate agroforestry production practices to enhance agricultural production and stem the pressure on forest cover. Forestry interventions could also help in Project 3 to rehabilitate degraded landscapes in the coastal zone.

MALI

Overview

Key climatic problems in Mali include decrease in rainfall, occasional catastrophic rains and wind storms in the Sahelian zone, high evapotranspiration rates due to high temperatures and persistent drought since 1970. Climatic risks identified include drought, floods, strong winds, and strong temperature variations. The predominant agrarian economy is highly vulnerable to these climatic risks. According to FAO (2010), 10.2% of Mali is forested and 3.2% of the land area is protected under IUCN categories I-V. Mali lost 11.2% of its forest cover between 1990 and 2010. By 2009 the country had no intact forest (Herold, 2009). Mali ratified the UNFCCC in 1994 and the Kyoto Protocol in 2002. The country submitted its Initial and Second National Communications in 2000 and 2012, respectively, and a NAPA in 2007. The evaluation below is based mainly on the NAPA.

Evaluation

Attenuation of the adverse effects of climate change on the most vulnerable segment of the population, in the context of sustainable development and fight against poverty, is the stated objective of Mali's NAPA. LEG guidelines were closely followed in preparing the document, i.e. it was multidisciplinary, participatory, complementary and consistent with sustainable development. The preparation was country-driven and sought to build in equality/equity among the sexes and environmental sustainability in the programme. The programme identified agriculture, health, fishery, energy, water resources, livestock, forest-fauna, habitat, transport, industry and education as key sectors of concern. A rigorous process based on the criteria of degree of adverse effects of climate change, degree of effect on poverty reduction, degree of loss avoided by vulnerable groups, synergy with multilateral

environmental agreements and, cost of the proposed option, were used in identifying 19 priority projects (Table 10). Project 12 on sensitising the people for better management of natural resources and elaboration of agroforestry techniques, and Project 13 on fighting bush-fires, directly relate to forestry.

Table 10. Priority projects identified in Mali's NAPA arranged in order of priority

Rank	Priority projects
1	Popularisation of varieties improved and adapted to the climatic conditions of major cereals cultivation areas (millet, sorghum, maize and rice).
2	Popularisation of best animal and plant species adapted to local climatic conditions.
3	Promotion of income-generating activities and development of mutual benefit societies.
4	Aquaculture management/development in Mali.
5	Promotion of cereal banks.
6	Utilisation of meteorological information to improve agricultural production and contribute to food security.
7	Management/development of low-lands.
8	Realisation of boreholes equipped with solar pumps.
9	Utilisation of *Typha australis* for energy purposes.
10	Contribution to the removal of barriers to the promotion of the application of solar energy in Mali.
11	Water catchment and restoration of water points.
12	Sensitising and organising people for the preservation of natural resources (elaboration of local convention for reforestation and agro-forestry).
13	Management of forest fires in Mali.
14	Development of soil and water conservation (CES)/soil defense and restoration (DRS) farming actions and of composting.
15	Development of fodder crops.
16	Elaboration of a technological package to train people on simple practices of adaptation to climate change.
17	Promotion of livestock feed banks.
18	Promotion of jatropha oil.
19	Implementation of an information system on the risks of diseases linked to climate change.

Implementation gaps

Being an LDC, the generic constraints of finance, weak institutional and administrative framework, inadequate human resources and lack of technical data are likely to apply to the implementation of Mali's NAPA. Mobilisation of external assistance through UNFCCC facilities should help to minimise these constraints. Forestry intervention in terms of intensified agroforestry to develop appropriate techniques for using forests and trees in agricultural production in the preponderantly semi-arid to arid environment will improve implementation of response projects. Thus, in addition to the direct forestry projects (12, 13), other projects implying production from land (e.g. 7, 15), or enhancement of water storage (11) can benefit from forestry interventions.

MAURITANIA

Overview

Three quarters of Mauritania is Saharan desert and the rest is Sahelian, both regions having coastal elements where temperature fluctuations are less pronounced than in the continental land mass. Climate change exacerbates the desertification process. Since the droughts of the '70s and '80s rainfall and, hence, productivity of the land have decreased drastically resulting in massive migration of the traditionally nomadic populations. Fisheries and iron ore mining are the main export earners of the country. The rain-fed agricultural activity produces only 10% of the country's food requirement. FAO (2009, 2010) data show that only 0.2% of Mauritania is forested, and the country lost 41.7% of this between 1990 and 2010. No area is protected under IUCN categories I-V. Mauritania ratified the UNFCCC in 1994 and the Kyoto Protocol in 2005. The country submitted its Initial National Communication in 2002, a NAPA in 2004 and the Second National Communication in 2008. The evaluation below is based mainly on the NAPA.

Evaluation

The preparation of Mauritania's NAPA followed the LEG guidelines – i.e. it was participatory, multidisciplinary and designed to be complementary to existing plans and programmes to fight poverty, and strategies to implement the Convention to Combat Desertification (CCD) and the Convention on Biodiversity (CBD). Applying rigorous criteria and weightings, 28 project profiles were defined (Table 11). The highest number of projects is in the water resources sector (1-8). Categorised under forestry are projects dealing with substitution of fuelwood with gas for domestic energy supply, strengthening of the institutional basis for nature conservation, and improvement of the knowledge base for forest resources management (19-21). While the projects on reforestation for energy, on agroforestry in the agricultural zone and on dune fixation (23, 24) directly involve forestry,

those on fodder production (15, 17 and 18) could also benefit from appropriate agroforestry interventions.

Table 11. Priority adaptation projects by sectors in Mauritania's NAPA

A. Water sector
1. Better knowledge of the cycle of the surface waters for 20 catchment areas. 2. Construction of flooding breakdown dikes in pluvial and oasis zones. 3. Introduction of 50 electric Moto-Pumps in the valley. 4. Dissemination of the drip technique in the valley and oasis zones. 5. Improvement of the management of underground water in Aftout. 6. Monitoring of water quality for 3 towns. 7. Experimental use of drip technique in oasis zone. 8. Support for better monitoring of the piezometric networks of the Aioun sandstones.
B. Agricultural sector
9. Promotion of water-saving techniques in oasis zones. 10. Improvement of agricultural techniques in pluvial zones. 11. Training and information of SPOs and CEs.
C. Livestock farming sector
12. Promotion of livestock mobility. 13. Promotion and development of domestic poultry farming. 14. Genetic improvement of local bovine breeds. 15. Introduction of new fodder species in the natural routes. 16. Processing of unrefined fodder and nutritional blocks. 17. Development of fodder crops. 18. Establishment of production unit for livestock fodder.
D. Forestry sector
19. Substitution of ligneous fuel. 20. Improvement of knowledge about, and sustainable management of the forest resources. 21. Institutional reinforcement of the structure responsible for nature conservation.
E. Arid ecosystem sector
22. Reorganisation of the communities adversely affected by climate change. 23. Participatory reforestation for energy and agroforestry in agricultural zone. 24. Fixation of shifting dunes threatening the country's socio-economic infrastructures.
F. Marine ecosystem sector
25. Preservation of the diversity of fish populations. 26. Protection and reinforcement of the dune bar. 27. Restoration and integrated management of the lowlands and wetlands. 28. Establishment of a plan to safeguard Nouakchott.

Implementation gaps

Mauritania's NAPA clearly identified funding and institutional constraints as obstacles to implementing the programme. External financial and technical assistance, as is already implied by UNFCCC support of LDCs, of which Mauritania is one, to prepare NAPA will

assist in alleviating these obstacles. Intensification of knowledge building for forest resources, development of appropriate agroforestry practices, especially in the area of fodder production, and adoption of community based forest management approaches, will greatly help in realising the overall objectives of the NAPA.

NIGER

Overview

The natural environment of Niger is harsh and divided into four bioclimatic regions aligned from the south to the north, from the Sudano-Sahelian region that occupies 1% of the land area (rainfall 600-800 mm/year), through the Sahelian zone (10% land area, rainfall 350-600 mm/year) and the Sahelo-Saharan zone (12% land area, rainfall 150-350 mm/year) to the Sahara (77% land area, rainfall <150 mm/year). According to FAO (2010), only 1.0% of the land in Niger is forested and 18.3% of this is classified as primary forest; the country lost 38.1% of the forest cover between 1990 and 2010, and 8.2% of the land area is protected under IUCN category I-V. Climate change, and especially repeated episodes of extreme weather events such as droughts since the 1970s, and flash floods, exacerbate the effects of human pressure on land, resulting in declining productivity in the predominantly agrarian economy. Forest area loss was estimated by 2005 to be occurring at the rate of 100 - 120 000 ha/year. Niger ratified the UNFCCC in 1995, submitted its Initial National Communication in 2000, its NAPA in 2006 and the Second National Communication in 2009. The evaluation below is based especially on the NAPA.

Evaluation

LEG guidelines were closely followed in preparing Niger's NAPA. The process was multi-disciplinary and participatory, involving key stakeholders from local communities, public and private sectors, the civil society and NGOs. It was prepared to be consistent with national programmes, especially the Rural Development Strategy (RDS) and the Poverty Reduction Strategy (PRS), as well as CBD and CCD. A rigorous process of selection and application of criteria was used to define 14 priority projects (Table 12), only one of which (11) directly refers to forestry. It is titled “Improving erosion control, water harvesting and conservation measures for agricultural, forestry and pastoral purposes” and can be interpreted to be seeking to apply forestry for improving erosion control, water conservation and pasture management.

Table 12. Priority projects identified in Niger's NAPA arranged in order of priority

Rank of project	Priority projects
1	Introducing fodder crop species in pastoral areas.
2	Creating fodder banks.
3	Restoring basins for crop irrigation.
4	Diversifying and intensifying crop irrigation.
5	Promoting peri-urban market gardening and livestock farming.
6	Promoting income-generating activities and developing mutual benefit societies.
7	Water control.
8	Producing and disseminating meteorological data.
9	Creating food banks.
10	Contributing to fight against climate-related diseases.
11	Improving erosion control actions (CES/DRS) for agricultural, forestry and pastoral purposes.
12	Disseminating animal and crop species that are most adapted to climatic conditions.
13	Watershed protection and rehabilitation of dump-off ponds.
14	Building of material, technical and organisational capacities of rural producers.

Implementation gaps

Major obstacles to implementing forestry and forest-related plans, as identified in the NAPA document, relate to finance and shortage of materials to address the complexity of the issues of adaptation in the harsh environment of the country. The response to the questionnaire survey specified policy inadequacy, inadequate enabling laws, and weakness

in enforcing existing laws and low public awareness as further constraints to implementation of forestry programmes. In addition to these, failure to explicitly recognise the role of trees and forests, especially in the context of agroforestry, in priority projects dealing with creating food banks for livestock and humans and watershed protection, is a gap that can be filled by intensifying forestry activities. Although deforestation is recognised as a major environmental problem, reforestation to rehabilitate degraded land is not included as a priority project. While the financial and material shortages can be addressed through mobilisation of external assistance, the deforestation and shortage of wood resources can be countered by placing greater emphasis on the use of trees and forests, especially in agroforestry strategies.

NIGERIA

Overview

Potential impacts of climate change in Nigeria range from sea level rise and salt intrusion into freshwater systems, ocean surge and coastal damage, through rainfall extremes, flooding and drought, to increased desertification. About 9.9% of Nigeria's land area is forested, of which undisturbed forest covers only 1.3%, and 47.5% of the forest cover was lost between 1990 and 2010 (FAO, 2010). About 3.6% of Nigeria's land area is protected under IUCN categories I-V. Nigeria ratified the UNFCCC in 1994, submitted its First National Communication in 2003 and acceded to the Kyoto Protocol in 2004. The Second National Communication is currently being finalised. A National Climate Change Policy was adopted this year (2012) by the Federal Executive Council (FEC), and a National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN) has been prepared and is awaiting FEC consideration. A UN-REDD grant of US$4 million was awarded to Nigeria in 2011 to support a National REDD programme. The evaluation below focuses on the NASPA-CCN and the REDD programme.

Evaluation

NASPA-CCN is a comprehensive document prepared by the Federal Ministry of Environment in collaboration with NGOs as lead partners. The Strategy was developed through extensive studies that included pilot projects at the community level across the main ecozones of the country, scenarios development and socio-economic analyses of climate change effects in the country. The preparation was highly consultative and participatory, with meetings, workshops and discussion groups involving stakeholders from the grassroots to policy makers at the highest level of governance. Gender is strongly mainstreamed into the Strategy, which also was designed to be consistent with the nation’s development agenda, supporting the MDGs and the Vision 20:2020 plan by which the country aims to be

one of the top 20 economies of the world by the year 2020. A comprehensive toolkit for integrating gender into climate change responses was, in fact, developed. Unlike NAPAs, the Nigerian Strategy does not identify priority projects. Instead it identifies priority goals, overall strategies and actions (policies, programmes, other measures) for the key sectors and issues in the country's economy. The implementation plan specifies responsibilities, time lines, indicative costs and high level indicators for every recommended action, and addresses all levels of society – federal, state and local governments, civil society, private sector, communities and individuals. The REDD actions are yet at the level of REDD Readiness planning at both federal and state levels.

Implementation gaps

Besides the common challenges of inadequate funding, poor knowledge base, particularly of the forest resource, and weak political commitment to sustainable forest management, impediments to implementing forest-based actions in response to climate change include the federal nature of government. Land and forest matters are on the concurrent list of legislation, with state governments alone serving as the principal managers of forest land. Federal action in the implementation of REDD, for example, can only concern over-arching activities like training, capacity building for human resources and national inventory. Details of management rest with State governments. Active collaboration between the states and the federal government is needed to realise the synergy that is possible from concerted action on forestry matters.

SAO TOMÉ & PRINCIPE

Overview

A notable impact of climate change in Sao Tomé & Principe is the lengthening of the dry period, from three to six months (April to September), with reduced river flow, as happened in 2005. Other impacts of climate change are torrential rains with lightning and land-slides, and coastal flooding with erosion and contamination of freshwater. FAO (2010) report that 28.1% of Sao Tomé and Principe is forested and no part of the country is protected under IUCN categories I-V, despite a high value of endemicity of the biodiversity in the country (29% for the fauna and 15% for the vascular plants species) (UNEP-WCMC, 2004). Sao Tomé and Principe ratified the UNFCCC in 1998 and the Kyoto Protocol in 2008. It submitted its Initial National Communication in 2005, NAPA in 2007 and the Second National Communication in 2012. The evaluation below is based on the NAPA.

Evaluation

Preparation of Sao Tomé and Principe's NAPA closely followed LEG guidelines. It was participatory, multidisciplinary and consultative of key stakeholder communities. It was based on extensive studies and consideration of existing programmes, viz. Studies of

Adaptation and Vulnerability to Climate Change, the First National Communication, the National Strategy for Adaptation to Climate Change, the National Report and Strategy for Drought and Desertification, the National Strategy and Action Plan about Biodiversity (ENPAB) and the Strategy for Poverty Reduction. LEG recommendations, including Multi-Criteria Analysis procedures, were used to define 22 priority projects (Table 13). Only one of the priority projects (4: SFM) directly refers to forestry. The potential role of forestry in projects dealing with reinforcement and diversification of agricultural production (6), introduction of new technology for use of firewood and making charcoal (14), sustainable management of water and energy (15), and introduction of renewable energy/biomass (17), is not highlighted in the project profiles.

Table 13. Priority projects by sector in Sao Tomé & Principe's NAPA

A. Infra-structure and public works
1. Relocation of local communities at risk of flood and landfalls in Malanza, Sta Catarina & Sundy.
2. Establishment of a system of Climate alert.
3. Establishment of the agro-tourist complex in Monte Café and Porto Real.
B. Agro-livestock and forest
4. Sustainable management of forest resources.
5. Integrated development project of goat/cow-rearing in the northern part of São Tomé.
6. Reinforcement and diversification of agricultural production.
C. Health
7. Training and study visits (doctors, nurses, volunteers, helpers, students, etc.) for emergencies.
8. Communication actions for behavior change.
9. Elaboration of epidemic database for potential diseases related to CC.
10. Correlation of data of vector diseases, especially malaria, through GIS system with MARA/OMS, initiative that anticipates the problem of spatial risk (epidemic malaria).
11. Elaboration of strategic and emergency plans emphasizing health sector.
D. Water and energy
12. Construction of two systems for drinking water supply in rural areas.
13. Evaluation and planning of water resources.
14. Introduction of the new technologies for firewood use and to making charcoal.
15. Sustainable management of water and energy.
16. Construction of two hydro-power stations in Claudino Faro and Bernardo Faro.
17. Introduction of renewable energies (solar, wind and biomass).
E. Fisheries
18. Construction of shelters and parks for artisanal fleet.
19. Construction and installation of Concentration Fish Device (DFC), at coastal zone.
20. Training the artisanal fishermen.
F. Public safety and civil protection
21. Reinforcement of human technical capacity - national service of civil protection and fire brigade.
22. Reinforcement of car parking - national service of civil protection and fire brigade.

Implementation gaps

Sao Tomé and Principe's NAPA acknowledges constraints of weak institutional, administrative and organisational capacity for implementing it. It also identifies the lack of qualified human resources and shortage of finance. These potential impediments can be addressed by mobilising external financial and technical assistance. Recognition and development of the role of forestry - e.g. strengthening agroforestry in diversification of agricultural production (6), adopting agroforestry, developing and using community forest management approaches in introduction of new technology for the use of firewood and charcoal making (14), in sustainable management of water and energy (15) and in renewable biomass energy development (17) - will greatly help to fill the gaps in implementing some of the identified priority projects.

SENEGAL

Overview

Water resources, agriculture and the coastal zone are identified as the principal sectors of the economy vulnerable to climate change in Senegal. Annual rainfall decreases from over 1 200 mm in the forested south, to about 600 mm in the savanna woodland of the central region and 200 mm in the arid north. FAO (2010) indicates that 44% of Senegal is forested, with 18.4% of this area being classified as primary forest. Change in forest cover between 1990 and 2010 was a loss of 875 000 ha or 9.4% of the area, while 10.7% is protected under IUCN categories I-V (UNEP-WCMC, 2004). Senegal ratified the UNFCCC in1994 and the Kyoto Protocol in 2001. It submitted its Initial National Communication in 1997, a NAPA in 2006 and the Second National Communication in 2010. The evaluation below is based mainly on the NAPA.

Evaluation

Development of Senegal's NAPA closely followed LEG guidelines and had five phases - mobilisation and organisation of several disciplines, sectorial studies, public consultations, selection and prioritisation of projects and development of the project profiles. The NAPA was made consistent with national development priorities, including the national development plan, PODES (*Plan d'Orientation pour le Développement Economique et Social*), the MDGs, the National Environment Action Plan (NEAP), Strategies for protecting Biodiversity, combating Desertification, reducing Poverty and promoting Sustainable Development. The plan defined four programme areas, each with a variable number of projects and activities (Table 14). Development of agroforestry is listed as number one priority and it is envisaged to apply agroforestry in addressing land use in the agro-ecological zones of the country. Of particular interest is the plan to apply agroforestry extensively in the enrichment of fencing in the groundnut-producing basin. Calculations in

the Second National Communication estimate that mitigation benefits from this practice could result from the sequestration of as much as 28 million tonnes of carbon over a 20 year period. Increment to wood capital from the practice over the same period is estimated to be as high as 30 m^3/ha or 900 000 m^3 on land that was initially bare. Direct forestry input is expected also in Activity 2 in Programme 3 (Restoration of mangrove) of the plan.

Table 14. Priority programmes, projects and activities in Senegal's NAPA

Programme 1. Development of agro-forestry
Activity areas: • North zone • Groundnut basin • South zone • Niayes zone
Programme 2. Rational use of water
Project 1. Revitalisation of hydrological networks of lowlands, temporary ponds and artificial lakes in support of the 'retention basin' programme. **Project 2.** Promotion of the drip technique (of irrigation).
Programme 3. Protection of the coast or littoral zone
Activity 1. Reduction of erosion to the level of the arrow (mark) of Sangomar. **Activity 2.** Restoration of the mangroves.
Programme 4. Sensitisation and education of the public

Implementation gaps

Listed among LDCs, potential barriers to realising the NAPA goals in Senegal include financial constraints and inadequate technical, institutional and human resources capacity, which can be addressed by harnessing external and internal sources of support. Intensive agroforestry research will be needed to fit appropriate forestry packages to the varied situations in which the Plan proposes to use agroforestry approaches. Adequate knowledge of mangrove silviculture is also needed for effective restoration of mangroves proposed in Activity 2 of Programme 3 in the Plan.

SIERRA LEONE

Overview

Results of scenario studies undertaken for Sierra Leone for the preparation of its NAPA suggest that by 2100, average annual temperature will increase by 7–9% above the 1961-1990 average. The change in precipitation over the same period is variable depending on model used, and projected sea level rise (SLR) is between 0.5 m and 2.0 m. These changes are likely to impact adversely on the predominantly agrarian economy of the country, dominated by rain-fed subsistence farming and dependence on natural ecosystems to supplement agriculture, and on the coastal region. FAO (2010) statistics show that 38.1% of the land area of Sierra Leone is forested, with 4.1% of this being classified as primary forest. Sierra Leone lost 12.6% of its forest cover between 1990 and 2010. Of the land area, 2% is protected under IUCN categories I-V. The UNFCCC and the Kyoto Protocol entered into force in Sierra Leone in 1995 and 2007, respectively. The country also submitted its Initial National Communication and a NAPA report in 2007. A note verbale followed in 2010. The evaluation below is based mainly on the NAPA report.

Evaluation

Preparation of Sierra Leone's NAPA followed the generic guidelines given by LEG. It was anchored by a Project Steering Committee of people from various backgrounds and disciplines, and chaired by the Director of Environment of the Ministry of Lands, Country Planning and the Environment. A participatory approach involving stakeholders in studies, consultations, workshops, meetings and roundtables was used, and the document was prepared to be in consonance with the country's sustainable development objectives. A rigorous set of criteria, developed according to the Multi-Criteria Analysis (MCA) approach recommended by LEG, was used in identifying 23 priority activities out of which 24 projects (Table 15) were defined. Three of these projects (6, 9 and 10) relate to forestry directly, while four others (15, 17, 18 and 19) will have significant forestry contents for their successful implementation. Forestry is also heavily emphasised in Sierra Leone's Nationally Appropriate Mitigation Actions.

Table 15. Projects developed from priority activities identified for Sierra Leone's NAPA

1. Development of an Early Warning System.
2. Rehabilitation and reconstruction of meteorological/climate monitoring stations throughout the country.
3. Capacity building of the MET Dept through training of personnel for the country's adaptation to climate change.
4. Sensitisation and awareness raising campaigns on climate change impacts on women relating to the three conventions of biodiversity, desertification and UNFCCC.
5. Development of inland valley swamps for rice production in the Moyamba District.
6. Development of an Integrated Natural Resources and Environmental Management System.
7. Development of irrigation and drainage systems for agricultural production in the Bombali District.
8. Promotion of the use of renewable energy (Solar Energy) and improvement of energy efficiency and conservation.
9. Establishment of Forest Reserves, Protected Areas and National Parks/Sanctuaries.
10. Management and protection of Forest Reserves and Catchment Areas including wetlands.
11. Institutional strengthening in the Water Resources Sector.
12. Improvement of the efficiency of existing water supply systems in both urban and rural areas.
13. Promotion of rain water harvesting and development of an Integrated Management System for fresh water bodies.
14. Establishment of a permanent study programme of the multi-species fisheries.
15. Delineation and restoration of vulnerable habitats and ecosystems in the Western area.
16. Improve on the quality on fisheries related data and research.
17. Development of an Integrated Coastal Zone Management Plan.
18. Rehabilitation of degraded coastal habitats in the Northern Region.
19. Development and enactment of appropriate policies and regulations relevant to the development of coastal communities, urban growth planning, and critical coastal ecosystems preservation.
20. Establishment of a national sea-level observing system.
21. Monitoring and control of malaria prevalence in the Moyamba District.
22. Monitoring and control of water and sanitation activities in the Koinadugu District.
23. Monitoring and control of HIV/AIDS prevalence in Koinadugu District.
24. Monitoring, evaluation and control of water and sanitation activities in slum areas of Freetown, the capital city.

Implementation gaps

Barriers to implementing the NAPA are identified in the report. Particularly relevant to the forestry projects are lack of reliable/updated data on the resource base, public awareness of climate change and forestry interaction, low capacity for enforcing environmental legislation and low level of financial support. Stepping up the forest inventory practice by making them comprehensive and more frequent and strengthening the forest research system by intensifying collection of data on the forest resource and its response to climate will address the lack of data issue. Development of community based forestry management in a changing climate will go a long way to deal with the awareness and law enforcement issues in forest protection and management. Strengthening the institutional capacity of the forest service to increase their influence in mobilising funds from international, regional and national sources will help to alleviate the financial constraints.

TOGO

Overview

Main environmental risks from climate change in Togo are flooding, drought, poor distribution of rainfall, late rains, violent winds and coastal erosion, with adverse effects on the predominantly agricultural economy, including fishery. FAO (2010) data show that only 5.3% of Togo is forested and that between 1990 and 2010, it lost its forest cover at the rate of 2.9% per year. Togo has more than 850 known species of amphibians, birds, mammals and reptiles, only 0.6% of which are endemic. By contrast there are over 3 000 species of vascular plants, 7.5% of which are endemic. Protected areas under IUCN categories I-V amount to 7.5% of the land area. Togo ratified the UNFCCC in 1995 and the Kyoto Protocol in 2004. The country submitted its Initial National Communication in 2001 and the Second National Communication in 2011, having submitted a NAPA in 2009 and a note verbale on NAMA in 2010. The evaluation below is based on the submissions, especially the NAPA.

Evaluation

Multidisciplinary and participatory procedures were followed in preparing Togo's climate response communications and plans. The NAPA is integrated into the country's poverty reduction strategy, as outlined in the Poverty Reduction Strategy Document (PRSD), and the development strategy based on the MDGs. Adaptation measures identified are also consistent with the approaches for implementation of the UNCCD and UNCBD. Defining criteria for selection of priority projects focused mainly on effectiveness in reducing vulnerability, contribution to sustainable development and cost effectiveness. None of the seven priority projects defined in Togo's NAPA (Table 16) explicitly emphasises forestry, although topmost priority was given to improving agricultural productivity in the face of a changing climate. In the Guinean and Sudanian savanna ecosystems, in which crop and

livestock production are mostly practised, agroforestry dominates the land production practice and will necessarily be part of any improvement in agricultural production. The NAMA communication lists increasing forest cover from 7% in 2005 to 30% by 2050, and improvement in biomass and renewable energy sources as appropriate mitigation actions. Improvement in agroforestry approaches can contribute to these objectives of the NAMA.

Implementation gaps

As an LDC, implementation of Togo's climate change response plans is likely to be constrained by shortage of finance, human and technical resources. These shortages are already being partially addressed by the existence of the LDC Fund (LDCF) of the Convention. Harnessing these and other sources of external assistance and application of the funds to human capacity building, research and infrastructure development should assist in overcoming the constraints to implementing the climate change response plans. Focus on improved agro-forestry approaches will help to fill gaps in forestry and forestry-related initiatives in these response plans, especially in the project to adapt agricultural production to climate change.

Summary

All the countries in West Africa are parties to the UNFCCC and the Kyoto Protocol. All, except Liberia, have submitted their Initial/First National Communication and 11 of them have submitted the Second National Communication. Being a party to the Kyoto Protocol is significant as it makes a country eligible to participate in the provisions of the Clean Development Mechanism of the Protocol that accommodates the forestry activities of Afforestation and Reforestation (A/R). All 15 Least Developed Countries (LDCs) in the sub-region have submitted NAPAs, and at least two of the non-LDCs have elaborated a national adaptation strategy with an implementation plan. Only six of the countries have responded to the Copenhagen Accord requirement for submission of Nationally Appropriate Mitigation Actions (NAMAs). The response plans and programmes in every case are described as being consistent with national development priorities, especially the poverty reduction and MDG achievement plans. Common constraints to implementation of the plans are shortage of funds and human resources, poor knowledge base and institutional bottlenecks. The majority of the countries identify forestry initiatives among the measures for responding to climate change. For many countries the involvement of forestry is not explicitly highlighted. Thus references to adaptation by improving and diversifying agricultural production, in systems where agriculture takes place in a landscape of trees and forests, have in many cases not explicitly highlighted improvement of agroforestry practices. Similarly, references to protection for water and soil conservation, or renewable energy enhancement as a mitigation measure, often have not highlighted the role of forestry. As all the countries are parties to the Kyoto Protocol, they are eligible to benefit from Afforestation and Reforestation (A/R) provisions of the Clean Development Mechanism of the Protocol. Along

with harnessing external support to improve financial and technical capacity, and applying the funds gained to building human (by education and training), research and institutional capacities, recognition of the role of forestry, and investment to strengthen this role, will have a widespread positive influence in achieving the goals of many of the listed climate change response measures in the sub-region.

Table 16. Priority projects by sector identified in Togo's NAPA ranked in order of priority

Rank	Title	Objective
Agriculture and Food Security sector		
1st	Adaptation of systems of agricultural production in 3 regions by putting in place farming techniques integrated with climate change and the improvement of agro-meteorological information.	Introduce farmers to doing their daily agricultural activities in relation to climatic and meteorological conditions of their place for food security.
5th	Develop small irrigation in valley areas for existing groups of gardens of the central, Kara and Savanna regions likely for stopping rural de-population.	Improve livelihoods of vulnerable communities of the central, Kara and Savanna regions, through the development of out-of-season garden farms.
Human Settlements and Health sector		
2nd	Put in place an early warning system for informing in real time, against flooding in the maritime and savanna regions.	Reinforce human and technical capacities of the national meteorological service and rural radios, in view of establishing reliable seasonal climatic forecasts and informing people in time to ensure adequate preparation and response, so as to minimise risks.
4th	Support and accompany rural communities of the Plateau and Savanna regions to prevent and combat vector transmitted diseases	Prevent and improve health status of vulnerable people/population of affected localities in the face of adverse effects of climate change and variability.
Coastal Zone		
3rd	Reinforce the plans of action of protection of the coast (littoral area) against coastal erosion in the eastern part of the autonomous port of Lome.	Protect the coastal zone against erosion, stop the receding beach, restore the mangrove and stop the pollution of freshwater by marine water.
6th	Initiate income-generating activitiesfor the communities of gardeners and fishermen of the coastal zone capacity building for action in the face of adverse effects of climate change.	Improve the capacity for adaptation of communities of gardeners and fishers in zones vulnerable to climate change, by the promotion of activities that generate revenue and protect the coast against marine erosion.
Water Resources sector		
7th	Support the capture of surface water resources in Savanna and Kara regions by the retention of water (from hills) at multiple points.	Improve food and health security of the target people, using irrigated agricultural production and the provision of potable water.

CHAPTER 2 Human, financial and physical capacities of public forest administrations to implement plans for climate change and related agreements

REPUBLIC OF BENIN

Public forest administration in Benin Republic is located in the Ministry of Environment, Habitat and Urbanisation. In addition to being a party to the UNFCCC and the Kyoto Protocol, the country is also a signatory to the following conventions: the Convention on Biodiversity (CBD), the Convention on Combating Desertification (CCD), the World Heritage Convention, Ramsar, CITES and the International Timber Trade Agreement (ITTA). The forestry administration of Benin as at 2008 was manned by 749 staff, 5% of whom were female. As an LDC, the human, financial and physical capacities of Benin to implement monitoring, reporting and verification (MRV) as this relates to forestry is very low (Table 17).

BURKINA FASO

The public forest administration of Burkina Faso is in the Ministry of Environment and Water, headed by the Director-General of Nature Conservation. As at 2008 there were 839 staff members in the country's forestry institutions. Burkina Faso is a signatory to the CBD, CCD, CITES, Ramsar and World Heritage Convention, besides the UNFCCC and the Kyoto Protocol. As an LDC it is constrained by inadequate financial, institutional and human capacity, hence, although its inventory capacity is rated as good, it has a very low capacity for forestry MRV (Table 17.)

CAPE VERDE

Cape Verde is a signatory to the CBD, CCD, CITES, Ramsar and World Heritage Convention, besides the UNFCCC and the Kyoto Protocol. Staff in forestry institutions in 2008 numbered only 27, 30% of whom were females, and as one of the LDCs, inadequate finance, poor physical structures, and weak institutions combine with low human resource capital to limit the capacity for MRV (Table 17). The high remote sensing technical challenges may be further contributing factors to the low MRV capacity.

CHAD

Chad is a signatory to CBD, CCD, CITES, Ramsar and the World Heritage Convention, besides the UNFCCC and the Kyoto Protocol. Chad's public forest administration is located in the Ministry of Environment and Water Resources, and as at 2008 there were 789 staff, of which 8% were females, in all forestry institutions in Chad. As an LDC, forestry activities in Chad are constrained by shortage of funds, inadequate human capacity and poorly developed institutions. There is limited forest inventory capacity and a very low capacity for forest area change monitoring (Table 17)

THE GAMBIA

Public forest administration in the Gambia is located in the Ministry of Forestry and the Environment, and is in charge of the management and protection of all but private forests in the Gambia. It has ratified, in addition to the UNFCCC and the Kyoto Protocol, the CBD, CCD, CITES, Ramsar and the World Heritage Convention. Being an LDC, the Gambia is constrained by shortage of finance, weak physical structure development, poor institutions and limited human capacity for implementing forestry activities. All forestry institutions in the country had a total of 194 staff in 2008, of which 3% were women. The Gambia has limited capacity for forest inventory and forest area monitoring (Table 17).

GHANA

Public forest administration in Ghana is vested in a Forestry Commission that is directly responsible to the Presidency. Ghana is a signatory to the CBD, CCD, CITES, Ramsar, ITTA and World Heritage Convention, in addition to the UNFCCC and the Kyoto Protocol. Although not one of the LDCs, shortage of funds, inadequate technical data and capacity, some institutional bottlenecks still constrain implementation of forestry activities in Ghana. There were 3576 staff members in Ghana's forestry institutions in 2008. This is reflected in the rating of Ghana's capacity for monitoring forest area changes as being good, despite a limited forest inventory capacity (Table 17).

GUINEA-BISSAU

Public forest administration in Guinea-Bissau is located in the Ministry of Agriculture and Rural Development, and the country is a signatory to the CBD, CCD, CITES, Ramsar and the World Heritage Convention besides the UNFCCC and the Kyoto Protocol. By 2008, there were 263 employees in the country's forestry institutions, and of these 11% were female. Guinea-Bissau is an LDC. Major impediments to successful implementation of forestry programmes in the country are shortage of funds, weak institutions and low human capacity. Guinea-Bissau has very low forest inventory capacity but some capacity for forest

area change monitoring, the latter presumably because the challenges to remote sensing are only medium (Table 17).

GUINEA CONAKRY

Public forest administration in Guinea Conakry is in the Ministry of Agriculture, Livestock, Environment, Water and Forests. In addition to the UNFCCC and the Kyoto Protocol, Guinea Conakry is a signatory to the CBD, CCD, CITES, Ramsar and the World Heritage Convention. As an LDC, the country is constrained by inadequate finance, low human capacity, weak infrastructural development and weak institutions in implementing forestry activities. Despite low remote sensing technical challenges, the capacities for forest inventory and monitoring forest area changes are very low (Table 17).

IVORY COAST

Public forest administration in Ivory Coast is in the Ministry of Water and Forests, headed by the Director General of Water and Forests. The country is a signatory to CBD, CCD, CITES, Ramsar, ITTA and the World Heritage Convention besides the UNFCCC and the Kyoto Protocol. Although not an LDC, the level of socio-economic development still means that inadequate finance, weak institutions and poor infrastructural development constrain the forestry administration in carrying out its functions. Inadequate knowledge, combined with the recent civil strife in Ivory Coast, are additional factors that constrain the implementation of forestry programmes. Despite the above factors and a limited capacity for forest inventory, Ivory Coast is rated as having good capacity for monitoring forest area changes (Table 17).

LIBERIA

Public forest administration in Liberia is vested in the Forest Development Authority. In addition to ratifying the UNFCCC and the Kyoto Protocol, Liberia is a signatory to the CBD, CCD, CITES, Ramsar, World Heritage Convention and the ITTA. As one of the LDCs, Liberia is constrained by lack of funds, weak institutions, inadequate technical data base and human capacity for successful implementation of its forestry-based climate change response programmes. As at 2008, there were 296 staff members, of which 10% were females, in all of Liberia's forestry institutions. There were plans in early 2012 for UNDP support of a study to identify capacity barriers, gaps and needs for the successful development of low emission development strategies (LEDS), nationally appropriate mitigation actions (NAMAs) and measurable, reportable and verifiable (MRV) systems and to review existing MRV instruments. Liberia has limited capacity for forest inventory but some capacity for monitoring forest cover changes (Table 17).

MALI

The Ministry of Rural Development and Environment has responsibility for the public forest administration in Mali. The focal point for forestry is the National Director of Nature Conservation. Besides being a party to the UNFCCC and the Kyoto Protocol, Mali is a signatory to the CBD, CCD, CITES, Ramsar and the World Heritage Convention. As an LDC, Mali is constrained by shortage of funds, weak institutional capacity and low human resources for successful implementation of its forestry-based climate change response programmes. There were 680 staff members, of which 9% were female, in the forestry institutions of the country as at 2008. Mali's capacity for forest inventory and monitoring forest cover changes is very low, despite having very low technical challenges for remote sensing (Table 17).

MAURITANIA

Public forest administration in Mauritania is located within the Directorate for Environment and Rural Development in the Ministry of Rural Development and Environment. Mauritania is a signatory to CBD, CCD, CITES, Ramsar and the World Heritage Convention besides being a party to the UNFCCC and the Kyoto Protocol. Mauritania is an LDC. Forestry activities, as all national socio-economic development, are constrained by lack of finance, weak institutions and infrastructure, poor technical and human capacity. The staff numbered 160 in the country's forestry institutions in 2008, of which 6% were females. In spite of low remote sensing technical challenges, Mauritania has only limited forest inventory capacity and its forest area change monitoring capacity is very low (Table 17).

NIGER

The Ministry of Environment and Fight against Desertification houses the public forest administration in Niger, which is headed by the Director General of Environment, Water and Forests. In addition to being a party to the UNFCCC and the Kyoto Protocol, Niger is a signatory to the CBD, CCD, CITES, Ramsar and the World Heritage Convention. As one of the LDCs, Niger is constrained by shortage of finance, weak institutions and physical structure development, as well as low technical and human capacity. There were 877 staff in Niger's forestry institutions in 2008 and 10% of these were female. Although the technical challenges to remote sensing are low and there is some capacity for forest inventory, forest area change monitoring capacity in Niger is very low (Table 17).

NIGERIA

Public forest administration in Nigeria is shared between the various tiers of government in Nigeria's federal system. At the federal level, it is located in the Federal Ministry of

Environment and manned by the Director of the Federal Department of Forestry. The ministry in which public forest administration is located varies among the states, ranging from Ministries of Natural Resources, to Ministries of Agriculture, Environment or Forestry. A few states have the public forest administration vested in a Forestry Commission responsible directly to the Executive Governor of the state. Forest administration in some states is devolved to the local government level. At the federal level, forest administration is limited to setting policy, coordination, providing advice, undertaking nationwide activities like national inventories, training and management of federal projects. Except for eight national parks, the federal government does not own or manage any forest land. Public forests are owned and managed by the states. Nigeria is a signatory to the CBD, CCD, CITES, Ramsar, World Heritage Convention and the ITTA, in addition to being a party to the UNFCCC and the Kyoto Protocol.

A review of experience in implementing national forest programmes in Nigeria concluded that lack of funds and personnel severely constrain forestry activities (EC & FAO, 2003), despite the fact that up to 13 120 staff members, 9% of which are female, are engaged in the country's forestry institutions. As many as 95 staff members are in the Federal Department of Forestry with 83 of them being in the professional cadre (Nigerian Forest Information System). The proportion of professional staff in the state services must be equally high given the large number of universities (>10) producing forestry graduates in the country. Nigeria has a limited capacity for forest inventory, and a very low capacity for monitoring forest area change (Table 17), despite the fact that the technical challenges for remote sensing are medium and the country has earth observation satellite facilities.

SAO TOMÉ & PRINCIPE

Public forest administration in Sao Tomé and Principe is located in the Ministry of Natural Resources and Environment, where a Director of Forests is the focal point. The country is a signatory to the CBD, CCD, CITES, Ramsar and World Heritage Convention, in addition to being a party to the UNFCCC and the Tokyo Protocol. As an LDC, implementation of forestry activities is constrained by inadequate financial resources, weak institutional and infrastructural development, and low technical and human resources capital. Technical challenges to remote sensing are high and together with the constraints enumerated above most likely account for very low capacities for forest inventory and monitoring of forest area changes (Table 17).

SENEGAL

The Directorate of Water, Forests, Wildlife and Soil Conservation, in the Ministry of Environment and Protection of Nature, houses the public forest administration in Senegal. The country is party to the CBD, CCD, CITES, Ramsar and the World Heritage Convention,

in addition to UNFCCC and the Kyoto Protocol (FAO, 2010). As an LDC, forestry activities, like general socio-economic development, are constrained by limited financial resources, weak institutional and infrastructural development, and low technical and human resources capital. There were 876 staff members (16% of whom were females) in all of the country's forestry institutions as at 2008. Senegal's capacity for monitoring forest area change is very low despite a low level of technical challenges for remote sensing and a good capacity for forest inventory (Table 17).

SIERRA LEONE

In Sierra Leone, public forest administration is the responsibility of the Department of Forestry in the National Commission for Environment and Forestry (NACEF). The country is a signatory to the CBD, CCD, CITES, Ramsar and the World Heritage Convention, besides being a party to the UNFCCC and the Kyoto Protocol. Being an LDC, Sierra Leone is constrained by shortage of funds, weak institutional and infrastructural development and inadequate human capital in implementing its forestry programmes. The forestry institutions in the country had only 195 staff, of which 8% were female, as at 2008. Through education and training, the country is yet rebuilding its human resources after a decade long civil strife that ended in 2002. Both forest inventory and forest area monitoring capacities in Sierra Leone are very low (Table 17).

TOGO

Public forest administration in Togo is vested in the Ministry of Environment and Forest Resources. Besides being a party to the UNFCCC and the Tokyo Protocol, Togo is also a signatory to the CBD, CCD, CITES, Ramsar, the World Heritage Convention and the ITTA. As an LDC, the country is constrained, in implementing its forestry programmes, by inadequate finance, poor human and technical capacity as well as weak institutional development. Togo has very low capacities for forest inventory and forest area change monitoring (Table 17).

SUMMARY

All the studied countries in West Africa are party to critical forestry-related Multilateral Environmental Agreements (MEAs). Possession of a good capacity for monitoring, reporting and verification (MRV) is essential to follow progress in implementation of these agreements. Table 17, extracted from a detailed assessment of national forest monitoring capabilities of over 90 tropical non-Annex 1 countries, summarises the critical elements of MRV capacity for the studied countries. The assessment was based on the existing performance of the countries in terms of such factors as consistency, transparency, comparability, completeness and accuracy of data on forest loss and greenhouse gas

emissions returned to such bodies as FAO, UNFCCC or the World Bank. Consistency, for example, refers to the capacity of using a systematic measuring and monitoring approach, rather than basing data on single date observations or integrating data from heterogenous sources. The results of the assessment by Herold (2009) show that only Burkina Faso and Senegal have good forest inventory capacity. Niger has some, but the rest of the countries have limited or very low forest inventory capacity. The majority (12 out of 18) of the West African countries have very low forest area monitoring capacity. It is significant that 11 of these countries with low forest area monitoring capacity are among the LDCs. It should be pointed out that the low capacities observed are partly a reflection of a long tradition of neglect of inventory and monitoring in forest practice in most African countries, including those in West Africa. The capacity building required is not just in terms of skills, tools and facilities, but also the need for re-orientation.

Table 17. MRV capacities of West African countries (Source: Herold, 2009)

Country	Forest inventory capacity	Area change monitoring capacity	Remote sensing technical challenges	Importance of fire/biomass burning	Amount of intact forest
1. Benin	Very low	Limited	Low	Medium	None
2. Burkina Faso	Good	Very low	Low	Medium	None
3. Cape Verde	Very low	Very low	High	Low	None
4. Chad	Limited	Very low	Medium	High	None
5. Gambia	Limited	Limited	High	Medium	None
6. Ghana	Limited	Good	Medium	Medium	None
7. Guinea-Bissau	Very low	low	Medium	Medium	None
8. Guinea Conakry	Very low	Very low	Low	Medium	None
9. Ivory Coast	Limited	Good	Medium	Medium	Some
10. Liberia	Limited	low	Medium	Low	Some
11. Mali	Very low	Very low	Low	High	None
12. Mauritania	Limited	Very low	Low	Medium	None
13. Niger	Some	Very low	Low	Medium	None
14. Nigeria	Limited	Very low	Medium	Medium	Some
15. Sao Tomé & Principe	Very low	Very low	High	Low	None
16. Senegal	Good	Very low	Low	Medium	None
17. Sierra Leone	Very low	Very low	Medium	Medium	None
18. Togo	Very low	Very low	Medium	Medium	None

CHAPTER 3 Role and extent of participation of women, youth and vulnerable groups in climate change programmes and plans

Most of the climate change response submissions reviewed recognised the poor and most vulnerable stakeholders for special attention, but fell short of spelling out women and the youth as prominent components of this group. An overwhelming majority of the NAPAs emphasised the integration of their plans into poverty reduction strategies and programmes, but only the Ghana and Nigeria national adaptation strategies devoted considerable attention to highlighting the need for special attention to women and the youth.

The Ghanaian experience (Kuuzegh, 2007; Anon., 2011) emphasised the need for gender sensitivity in an adaptation strategy, noting that climate change 'impacts greatly on women and the poor because they depend mostly on natural resources and economic sectors (like agriculture) that are susceptible to climate change'. The Nigerian National Adaptation Strategy and Action Plan on Climate Change (NASPA-CCN) (BNRCC, 2011a) is very detailed in its treatment of vulnerable groups - women, children and youth, the aged, and people with disabilities or special needs. Excerpts from the strategy are presented in *Annex 1* to illustrate the detailed treatment. Not only are these groups frequently recognised in the preamble sections of the strategy document, but they are also treated as one of the 13 sectors/themes for attention in the core sections of the document, analysing impacts and laying out strategies for adaptation. Gender mainstreaming is, in fact, one of the imperatives on which the Nigerian strategy document is built. In the impact analyses section, for example, the Strategy considers the various ways by which changing temperatures and rainfall, extreme weather events, sea level rise and storm surges differentially impact on vulnerable groups. It notes that heat stress, associated with climate change, can have increased impact on women due to socio-cultural confinement, common in West Africa, which limits the ability of women to seek relief from heat, and that the impact of heat stress is greater on pregnant and menopausal women than other groups. It further notes that decreased rainfall and droughts increase the burden on women and children who have to make greater effort (including walking longer distances) to find water. In the section that lays out strategies, the Nigerian document sets out the following goals for the vulnerable groups, including women:

- to develop programmes that support and assist the adaptation to climate change by vulnerable groups, including women, children and youth, the aged, and people with disabilities/special needs;

- to harness opportunities arising from differential roles and responsibilities, representation and experiences of vulnerable groups for climate change adaptation.

Overall strategies proposed include creating gender awareness and providing basic training for staff of government and public agencies, adapting public facilities, re-training health workers and encouraging civil society organisations to develop special social welfare programmes and other support to address climate change-induced needs of vulnerable groups. As a companion to the Strategy, a special gender toolkit was developed, to facilitate the integration and mainstreaming of gender into all aspects of climate change response work (BNRCC, 2011b).

Some measure of the participation of women in forestry activities, and by extension in forest-based national and sub-national climate change programmes and plans, is given by the human resources employment profiles of forestry institutions in the West African countries studied (*Table 18*). On the average, in 2008, less than 11.5% of the human resources in West African forestry institutions were females.

The proportion of females employed in forestry institutions belies the true proportion of females engaged in forestry activities in West Africa. Except in countries where cultural norms limit field activities of women, they dominate the collection, processing and marketing of edible and medicinal non-wood forest products in West Africa. They participate prominently also in forest raising activities, doing nursery work, taking part in planting out and watering of seedlings as well as monitoring agroforestry practices and, as pointed out by a respondent from Niger, protecting naturally regenerated tree seedlings. Thus, where forest-based climate change response programmes involve afforestation and reforestation women participation will need to be enhanced. But, as pointed out in Section 5 below, practices that limit the right of women to own land may hinder the expansion of participation of women in some forest-based responses to climate change, such as the REDD mechanism.

Table 18. Human resources employment profiles of forestry institutions in West African countries in 2008, showing the proportion of females

Country	Total staff	% female1	Number female
1. Benin	749	8	60
2. Burkina Faso	839	n.d.	n.d.
3. Cape Verde	27	30	8
4. Chad	789	8	63
5. Gambia	194	3	6
6. Ghana	3 576	n.d.	n.d.
7. Guinea-Bissau	263	11	29
8. Guinea Conakry	n.d.	n.d.	n.d.
9. Ivory Coast	n.d.	n.d.	n.d.
10. Liberia	296	10	30
11.Mali	680	9	61
12. Mauritania	160	6	10
13. Niger	877	10	88
14. Nigeria	13 120	9	1180
15.Sao Tome & Principe	n.d.	n.d.	n.d.
16. Senegal	876	16	140
17. Sierra Leone	196	8	16
18. Togo	n.d.	n.d.	n.d.
Average/Total	**> 22 500**	**10-11.5**	**>1 700**

[1] Not all countries specify No. of women.

CHAPTER 4 Measures/approaches and incentives to increase the role of and benefit to women, youth and vulnerable groups in forest-based climate change programmes and plans

The extensive literature on women in forestry in West Africa (e.g. Williams, 1992; Weah, 2012) points to the constraints to women's participation in forestry activities as including:

- limited mobility;
- restricted land and tree tenure rights;
- limited education and training;
- lack of money and income-generating opportunities;
- inadequate access to resources;
- women's heavy workloads;
- inadequate representation in important decision-making structures;
- poor access to information caused partly by a higher illiteracy rate among women.

Increasing the role and benefit to women in forest-based climate change programmes and plans in West African countries would require that the above constraints be effectively addressed. The approach to doing so is, perhaps, best illustrated by taking the concrete example of women's participation in the emerging REDD mechanism in a country like Nigeria. Expanding traditional activities, such as:

- nursery work;
- tree-planting for afforestation and reforestation;
- planting and monitoring agroforestry work;
- engagement in protection of natural regeneration;
- opportunities for gathering, processing and marketing non-timber forest products (NTFPs).

These activities should, ordinarily, increase roles of and benefits to women in forestry in West Africa. But doing this in the context of REDD has the potential of institutionalising and sustaining such benefits, as forest practice changes in response to climate change. Focusing on developing the NTFP enterprise (collection, processing and marketing) into an attractive industry, in the context of REDD, offers an opportunity for addressing the constraints listed above at the same time as sustaining the increase of benefits to women in forest-based response to climate change.

First, gender experts (Emana, pers. comm.) observe that the current debate on REDD and its implementation may be based on weak assumptions about compliance and voluntary participation of local communities, made up mostly of women and vulnerable groups, in an entirely new arrangement of subsistent livelihood and rural economy. The insistence, in REDD arrangements, on basing rewards on tenure security assumes that everyone is a land title holder, and can or should be one. It ignores the fact that a large majority of the people, mostly women and vulnerable groups, who work in forests with legal land tenure rights, do so as paid labour or gatherers of NTFP. Enforcing REDD's ownership criterion may dislodge this army of labourers and NTFP gatherers and upset age-long subsistent arrangements, with dire consequences for livelihoods and households. An alternative approach to tying REDD rewards to land ownership would be to design forest carbon sequestration programmes that recognise and address the needs of all whose livelihoods are tied to the forest. A creative programme is required that links forest carbon sequestration to a viable NTFP industry. The participation of women and the youth can be greatly enhanced by creating such an industry. It is in the context of such an approach that the following measures are suggested for a country like Nigeria:

a) adopt a policy oriented approach with clear obligations for federal, state and local governments; this addresses the federal nature of Nigerian governance where forestry matters are on the concurrent list of legislation, with actual management of forests being the responsibility of state and local governments, while the responsibility of the federal government is limited to over-arching actions like policy, advice, coordination, research, implementation of defined forestry projects (often foreign funding) and training;

b) formalise land/forest tenure rights in the NTFP sector to guarantee actors in the sector (mostly women and youth) a secured source of livelihood; this will involve regularisation of forest tenure holdership rights for those with insecure land rights;

c) formulate policies that can support increased incomes by women and youth in NTFP;

d) encourage and facilitate (through incentives) voluntary participation of women especially in strategic roles that stir a sense of obligation in forest-based climate change programmes;

e) design forest carbon sequestration programmes in ways that recognise and address the socio-economic needs of women and the youth;

f) institutionalise social and environmental safeguards in NTFP activities and their linkage with REDD programmes, to avoid over-exploitation but promote sustainability;

g) dedicate specific tasks such as seed planting and agroforestry monitoring to women and the youth to stimulate interest and commitment;

h) industrialise the NTFP sector as a way of making the female-dominated enterprise competitive and a sure way to ensuring permanence in sequestered carbon;

i) review trade policies in ways that allow local workers in NTFP to gain sufficient status and bargaining power in the production and commercialisation chain, and improve the international trade value of NTFP, which are increasingly gaining attention in the international market (IFAD, 2008), where they are largely used as raw materials for skin care and natural health products;

j) strengthen national export promotion strategies, and stimulate policies that can strengthen regional markets for NTFP;

k) establish or expand industries that use NTFP, and minimise negative factors in trade liberalisation that can threaten NTFP;

l) take advantage of the commercialisation and industrialisation of the NTFP sector to create jobs for women and the youth in the production chain, from bioprospecting for, to gathering, processing and packaging of NTFP;

m) put in place measures that can moderate the power relations in the production chain so that local women and youth gatherers can gain more bargaining power in transactions and sale of these products;

n) promote the domestication of NTFP by engaging women and the youth in agroforestry practices that incorporate valuable multipurpose fruit and medicinal trees, like *Irvingia* spp. and *Prunus africana*.

The above measures, though formulated with Nigeria in mind, can readily be adapted in varying degrees to all the West African countries in this study, as measures for increasing the role of and benefit to women, youth and vulnerable groups in forest-based climate change programmes and plans.

Conclusion

The need for more detailed assessment than in the present study is indicated from the above findings, to identify specific forestry interventions that should be made, and how to implement them in the priority climate change actions developed by the studied countries. Response actions will also be enhanced if the above is accompanied by an active programme of sensitisation, orientation and training of the West African countries, emphasising the importance of forest inventory, monitoring, reporting and verification of forest cover changes in implementing sustainable forest management and forest-based responses to climate change. It is also necessary to initiate and promote research into the development of the NTFP enterprise into commercial industries in forest-based climate change responses, in order to enhance the role of women, youth and vulnerable stakeholders, who dominate NTFP collection and marketing activities. Taking the above actions should markedly improve not only the implementation of forest-based responses to climate change but also sustainable forest management itself in the West African sub-region.

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Annex 1.

EXCERPTS FROM THE NATIONAL ADAPTATION STRATEGY AND PLAN OF ACTION ON CLIMATE CHANGE IN NIGERIA (NASPA-CCN) TO ILLUSTRATE DETAILS OF TREATMENT OF VULNERABLE GROUPS.

A. AS ONE OF 13 IMPERATIVES GUIDING THE STRATEGY AND PLAN OF ACTION

Gender is mainstreamed into Nigeria's Adaptation Strategy thus:

"Gender mainstreaming is the process of assessing the implications for women, female youth, men, male youth and the elderly of any plan of action, policy or programme at any level. It is a way of ensuring that these groups have the opportunity to participate in the design, implementation, monitoring and evaluation of policies and programmes, and benefit equally from climate change adaptation (CCA) policies and programmes. The use of participatory approaches during community analysis and needs assessment, where all members of the community are involved in planning, gives an understanding of the gender roles, including different vulnerabilities."

Note: Gender was mainstreamed into this document by considering gender dimensions of the impacts of and vulnerability to climate change, and the gender dimensions of the adaptation options in various sectors.

B. THE STRATEGY; IMPERATIVE NO 12: VULNERABLE GROUPS

Goals:

1. To develop programmes that support and assist the adaptation to climate change by vulnerable groups, including women, children & youth, the aged, and people with disabilities/special needs.

2. To harness opportunities arising from differentiated roles, responsibilities, representation and experiences of vulnerable groups for climate change adaptation.

Overall strategies:

1. Create awareness among government staff, including disaster and emergency management personnel, about climate change impacts and how these impacts affect vulnerable groups.

2. Provide basic training for government staff on gender awareness tools to enhance implementation capacities.

3. Adapt government programmes, including emergency response plans and programmes directed at vulnerable groups, to better address the impacts of climate change on these groups.

4. Adapt public service facilities, including school buildings, to withstand storms and excess heat.

5. Intensify immunisation of children and youth to provide protection against diseases that are expected to become more prevalent with climate change.

6. Retrain health workers to appreciate emerging climate change challenges within the context of immunisation and other comprehensive healthcare delivery systems.

7. Encourage faith-based and civil society organisations to provide social welfare programmes and other support to address the climate change-induced needs of vulnerable groups.

Recommended policies, programmes and other measures for vulnerable groups:

***Federal Government*:**

1. Federal Government staff: Key staff in all Ministries, Departments, Commissions and Agencies should participate in internal education and learning programmes to become more familiar with how climate change affects vulnerable groups.

2. Emergency management needs of vulnerable groups: Federal disaster and emergency management organisations (e.g. NEMA) should develop response plans for emergency evacuations specific to the needs of vulnerable groups (who face more severe problems during climate-induced emergencies), and should assign additional resources to programmes supporting these vulnerable groups. Periodic engagements with people in high risks areas should also be encouraged so that women and the elderly are better prepared in the event of a disaster. This initiative should be closely integrated with the Comprehensive Emergency Management Programme for Nigeria (Sector/Theme 10: Disaster, Migration and Security).

3. Programmes for women and youth: Programmes of the Federal Ministry of Women Affairs and Social Development and the Federal Ministry of Youth Affairs should be modified or developed to respond to the impacts of climate change on vulnerable groups.

4. Immunisation of children and youth: The Federal Ministry of Health should expand programmes to immunise children and youth against cerebro-spinal meningitis, which is expected to become more prevalent with a changing climate.

5. Modifications to school buildings: Funds from the Education Trust Fund should be used to modify schools across Nigeria so that they better withstand extreme rain, windstorms and excessive heat.

6. Programmes in the Niger Delta: The Federal Ministry of the Niger Delta and the Niger Delta Development Commission (NDDC) should develop programmes that respond to the needs of coastal communities exposed to sea level rise and storm surge destruction. These programmes should build on current projects in the areas of shore protection and erosion control, environmental rehabilitation, water, schools, health care, and hospitals.

State and Local Governments:

1. Cooperation with the Federal Government: State Ministries with concurrent responsibilities with the Federal Government in areas of Women Affairs, Social Development, Youth, Emergency Relief, Education, Health, etc. should develop the capacity to cooperate with, facilitate and help implement national programmes for vulnerable people affected by climate change.

2. Social welfare: All State and Local Government agencies with a mandate to provide social welfare and/or community-based development assistance should initiate programmes designed specifically to assist the vulnerable people most affected by climate change impacts.

Civil society organisations and communities:

1. Advocacy: CSOs/NGOs should advocate for State welfare agencies to acquire the capacity to address current and predicted climate change impacts affecting the welfare of vulnerable groups.

2. Health and welfare organisations: CSOs/NGOs should encourage faith-based health and welfare organisations to better understand climate change impacts on women, the poor, and other vulnerable groups, and to develop enhanced capacity to respond to the climate-related needs of these groups.

3. Health impacts: CSOs/NGOs should build their knowledge about health impacts of climate change on vulnerable groups (e.g. impacts of heat stress), and document how institutions can best respond. Faith-based organizations and CSOs/NGOs should provide information to community leaders on the need for immunisation of children and youth against cerebrospinal meningitis.

4. Schools: CSOs/NGOs should work with schools to help build climate change adaptation skills and knowledge among youth in the community (whether in or out of school).

5. Microfinance for vulnerable groups: CSOs/NGOs should encourage microfinance organisations to increase their understanding of climate change impacts and encourage them to develop the capacity to support vulnerable groups affected by climate change.

Organised private sector:

Microfinance: Leaders of microfinance organisations should increase their understanding of climate change impacts and develop their organisational and financial capacity to provide support for vulnerable groups, including livelihood support programmes.

Note 1. Key Federal Government agencies include: Federal Ministry of Women Affairs and Social Development; Federal Ministry of Health; Federal Ministry of Youth Affairs; National Emergency Management Agency (NEMA); Federal Ministry of Education; Education Trust Funds; Federal Ministry of the Niger Delta; and the Niger Delta Development Commission (NDDC).

Note 2. Key State Government agencies include: State Ministries of Women Affairs and Social Development; State Ministries of Youth and Sport; State Emergency Relief Agencies; State Universal Basic Education Boards; State Ministries of Education; State Ministries of Health; Secondary Education Management Boards; and State Oil Producing Areas Development Commission. Key Local Government (LG) agencies include: LG Education Department, LG Health Department, and LG Welfare Department.

Note 3. Key civil society organisations include: Faith based groups; NGOs; Red Cross; and Community Development Associations.

Source: www.nigeriaclimatechange.org

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