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Africalnteract

Enabling research-to-policy dialogue for adaptation to climate change in Africa

Research and Policies for Climate Change Adaptation in the Central Africa Health Sector

SUMMARY



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Acronyms and Abbreviations

AAP	Africa Adaptation Programme
ARV	Antiretroviral
CAR	Central African Republic
COMIFAC	Commission des Forêts d’Afrique Centrale
DHS	Demographic and Health Survey
DRC	Democratic Republic of Congo
GDP	Gross domestic product
HIV/AIDS	Human immunodeficiency virus / acquired immunodeficiency syndrome
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
NAPA	National Adaptation Programme of Action
NGO	Non-governmental organisation
STP	São Tomé and Príncipe
TB	Tuberculosis
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

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1. Introduction

Climate change remains a serious threat to development in Africa and vulnerability of the continent to climate change is deepening, making it the most exposed region in the world to the impacts of climate change (World Bank 2009). Climate change projections for Africa suggest that food and nutrition security, and water security, livelihoods, shelter and health are all at risk (IPCC 2007).

Adverse health impacts resulting from climate change are expected for Central Africa, although the impacts of climate change are poorly understood. Vulnerability assessments in the National

Communications of Central African countries to the UNFCCC and NAPAs state that countries should expect an increase in water and vector borne diseases such as cholera and malaria due to increases in annual precipitation and intensity of heavy rainfall events. Despite a low climate risk relative to the rest of the continent, vulnerabilities to climate change in Central Africa will increase without adaptation actions.

There is growing research interest in and support for adaptation to climate change in Africa; therefore findings emerging from relevant research are appropriately applied to inform policy formulation for climate change adaptation. With support from IDRC, AfricaInteract and CORAF/WECARD commissioned a desk review of research and policies related to climate change adaptation in the health sector in Africa. This review assessed the existing knowledge base on the impact of climate change on the health sector of Central Africa and documented current research and the state of knowledge of climate change impact on disease burden and related threats. The extent to which health concerns are mainstreamed into broader climate change policies and how health policies address climate change issues were also reviewed. This review also identified gaps in current climate change adaptation research and policies and measures needed to adopt *best practices* for climate change adaptation. Specifically, the review was conducted to seek answers to the following key questions:

- What is the role of climate change challenges in the context of the multiple challenges and opportunities facing the health sector in the region?
- What is the current state of knowledge on adaptation to climate change in the health sector in the region?
- What is the current state of knowledge on whether and how research findings are integrated in health sector policies in the region?
- What are the major gaps in research on adaptation to climate change in the health sector?
- What is needed to ensure that research findings are better integrated into health sector policies?
- What is the current state of understanding on key stakeholders involved with research and policy on adaptation to climate change in the health sector in the region, and how can stakeholder involvement be improved?

This publication is a Summary of the main report published by CORAF/WECARD and Future Agricultures.

2. Overview of the Central Africa Health Sector and Climate

Central Africa consists of different ecosystems and climates; Saharan desert in the far north, savannahs in the north and south, glaciers in the east, and the world's second-largest expanse of tropical rainforest in the Congo River Basin. In Central Africa, expenditure on health per capita and on health as percentage of the gross domestic product (GDP) varies from country to country. The annual per capita expenditure ranges from US\$32 in DRC to US\$514 in Gabon. The GDP percentage for health ranges from 2.5 percent in Congo Republic to 7.7 percent in STP. The greatest causes of morbidity in Central Africa are malaria, respiratory tract infections, diarrhea

and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS). Mortality related to HIV/AIDS and tuberculosis (TB) has significantly affected the region's life expectancy. According to the World Health Organization (WHO 2012), the mean life expectancy in Central Africa in 2007 was 51.4 years compared to 65.4 years in developed countries and 54.2 years in Africa.

The region's infant mortality rate in 2007 was 93.70 per 1,000, compared to 85.30 per 1,000 in Africa. The major causes of death in children under five years were malaria (16 percent in Cameroon, 26 percent in Congo and 15 percent in Gabon), pneumonia (15 percent in Cameroon, 14 percent in Congo and 11 percent in Gabon) and diarrhoea (13 percent in Cameroon, 11 percent in Congo and seven percent in Gabon). Malaria incidence in children under five years was 26.8 percent in Cameroon and 32 percent in Congo. From 2005 to 2011, 30 percent of children under five years received care at health facilities and 13 percent of them slept under insecticide treated nets in Cameroon, and only 6 percent in Congo slept under insecticide treated nets.

Projections according to General Circulation Models indicate that equatorial and coastal areas of Central Africa could warm by approximately 3°C this century at a slightly lower rate than the continental average (Boko et al. 2007; Christensen et al. 2007). The western region of Central Africa, including Cameroon, Congo and Gabon, faces a projected increase in the mean annual temperature of 0.9°C to 2.9°C by 2060, and 1.3°C to 4.7°C by 2090 (McSweeney et al. 2010). Projections of mean annual rainfall averaged over the region indicate a wide range of changes in precipitation. For instance, projected changes range from -8 percent to +17 percent in Cameroon (ensemble median = 0 to +2 percent), and from -22 percent to +25 percent in Gabon (ensemble median = -1 to +1 percent) by 2090. Central Africa will experience a variety of impacts from climate change due to the region's size and the variety of ecosystems, topographies and climates that lie between Angola in the south and Chad in the north (Crawford et al. 2011).

To reduce the negative impacts of climate change on health, various adaptation programmes or measures are being planned or implemented in Central African countries. Some of the ongoing or planned adaptation measures are reported in the countries' National Communications to the UNFCCC and NAPAs. The adaptation needs for the health sector include strengthening current management strategies; undertaking preventive initiatives including education programmes, improved water systems, early warning systems for natural disasters and improved access to health services; improving basic sanitation infrastructure; launching anti-malaria campaigns; and enhancing measures in place to reduce malaria.

3. Research Related to Climate Change in the Central Africa Health Sector

Climate vulnerability assessments by National Communications and NAPAs of Central Africa countries state that countries should expect an increase in water and vector borne diseases

(such as cholera and malaria) due to increases in annual precipitation and in the intensity of heavy rainfall events (Crawford et al. 2011).

3.1 Food and Water borne Diseases

Central Africa is endemic for cholera and is regularly affected by small outbreaks. Projected climate change impacts in the region, which include increase in extreme weather events, increased risk of drought and flooding and coastal flooding from sea level rise will exacerbate the situation. In 2010, an unusually high incidence of cholera was reported in Cameroon and Chad. Seasonal factors, such as flooding in the rainy season, as well as poor hygiene conditions and population movements in the area contributed to this outbreak.

Research efforts are attempting to build an early warning system for cholera outbreaks based on *V. cholerae* ecology (Constantin de Magny et al. 2008) and using demographic, economic, environmental and climatic predictors with a one month lag time (Buczak et al. undated). These results suggest that accurate forecasting of cholera outbreaks in Central Africa may be achievable, which could support decision-making in epidemic outbreaks. It is important to document not only the seasonal nature of these illnesses in the region, but also their susceptibility to climate variability as well as the extent to which social, demographic and political conditions will influence current coping strategies.

3.2 Vector borne diseases

According to IPCC (2007), Central African countries should expect an increase in annual precipitation and in the intensity of heavy rainfall events. This should lead to an increase in water and vector borne diseases, namely cholera and malaria.

The most studied climate-related disease is malaria, the major cause of death in Africa, particularly among young children (Snow et al. 1999). Laboratory studies quantified the direct effects of climate variables on the biology of malaria vectors (Lyons et al. 2012). Based on biological constraints of climate on parasite development in mosquitoes and mosquito's development cycle, modelling was used to define the distribution of malaria transmission risk (Craig et al. 1999; Snow et al. 1999) and to show long term changes in the spatial distribution of malaria vector species (Sogoba et al. 2007a; Minakawa et al. 2002; Bayoh et al. 2001) and subspecies (Sogoba et al. 2008). In Cameroon, the natural distribution patterns of *Anopheles* species were largely determined by altitude, with some species having unique environmental tolerance limits (Tanga et al. 2010; Tchuinkam et al. 2010).

In the tropical forest zone of Cameroon, changes in temperature affect natural regeneration of forests and the water balance. This enhances vector development and extends its life span to transmit the disease. Ongoing deforestation in Cameroon alters the microclimate of an area to become suitable to malaria vector species that previously could not survive in the area. Manga et al. (1995), working in an area that has been deforested to build a new airport, observed that

deforestation resulted in the introduction of *An. gambiae* into a habitat that was previously predominated by *An. moucheti*. *An. gambiae* is the most efficient vector of *P. falciparum* in Africa. The implication of this new invasion by *An. gambiae* is that malaria transmissions in this area will increase. For malaria and schistosomiasis in the Sudano-Sahelian zone of Cameroon, higher temperatures, shorten the extrinsic incubation period such that several broods of infective parasites are produced (CICERO 2000). Under a warming projection of 6°C by the year 2100 the incidence of malaria will increase as a result of accelerated metabolic processes and nutritional requirements of the vector.

In Congo, changes in climatic conditions and anthropogenic activities resulted to increased environmental degradation such as a reduction in river flow since the 1970s, an increase in erosion and a decrease in agricultural potential. These changes are directly impacting on important economic sectors such as the energy sector and are likely to continue to impact on them (AAP 2011b). River flood recession enhanced the creation of suitable breeding sites for malaria vectors and sustained malaria transmission after the rainy season (Sogoba et al. 2007b; Toure et al. 1996).

In Gabon, erosion along the coastline threatens coastal infrastructure and disrupts traffic flow along the coastline and the country's economic activities. Consequently, sea level rises and coastal erosion there is also the threat of water depletion due to increasing salinity of the water in the lowlands. Saltwater breeding malaria vector species colonized new areas and expanded malaria transmission (AAP 2011c).

3.3 HIV/AIDS

Central Africa is experiencing a rapid spread of HIV/AIDS. In 2007, prevalence among the sexually-active population of the region was 4.6 percent. This rate varies from 5.5 percent in Angola to 14.8 percent in CAR (AfDB 2011). The dynamics of the disease seems to be related to population density, nutrition, health status and seasonal or exceptional movements of people. The links between climate change and HIV/AIDS are still conjectural but they are becoming a subject of increasing concern and study. HIV/AIDS leads to low agricultural productivity as more and more farmers are infected and affected. Survivors spend time attending funerals, lasting for several days, and look after orphans.

Spread of HIV/AIDS is likely to be accelerated in a situation of large-scale migration (Thornton et al. 2006). A high positive correlation was consistently observed between rainfall in a given month and the risk of mother-to-child transmission of HIV-1 in children born 3 months later in Yaoundé, Cameroon (Ayouba et al. 2003). Ongoing research in Central Africa is aimed at better understanding of physical, psychological, social and religious adaptation to HIV/AIDS.

4. Health Policies related to Climate Change in the Central Africa Health Sector

African governments, through their Ministries of Health and Ministries of Environment made firm commitments to address climate change while emphasizing health adaptation. The WHO, and other United Nations agencies, in collaboration with Member States and other partners developed a framework for health adaptation to climate change. The framework provides guidance to enable African governments to translate the commitments into action (WHO 2011; WHO/AFRO 2011). Each country was requested to submit a National Communication or a NAPA to UNFCCC. Seven countries in Central Africa have submitted National Communications to the UNFCCC. Four countries, namely Central Africa Republic, Chad, Democratic Republic of Congo and São Tomé and Príncipe, have prepared NAPAs; while Angola, is currently preparing its report. Vulnerability assessments produced by governments of all countries in the region identified human health as a source of significant vulnerability to climate change.

The degree to which governments in the region have integrated climate change into national development plans varies. Angola and Equatorial Guinea are yet to submit National Communications or NAPAs, while Cameroon and Gabon have made significant progress toward integrating climate change considerations into their national development policies (Crawford et al. 2011). Cameroon has integrated climate change adaptation and mitigation strategies into its National Plan for Environmental Management, while Gabon has established a national Climate Council to develop national climate change policies and prepare a National Climate Plan. Intra-regional climate change action policies through the Economic Community of Central African States (ECCAS) and COMIFAC, is limited. Policy initiatives tend to lag behind project- and programme-based initiatives.

Cameroon: To address climate change issues, the government of Cameroon has established the Cellule Nationale des Changements Climatiques, which is mandated to: 1) create an inventory of national greenhouse gas emissions and adaptation measures; 2) set up an information system and database on climate change, and establish an online home for this information to ensure its accessibility and dissemination; 3) design sectoral projects addressing priority actions for climate change prevention, mitigation and adaptation; and 4) evaluate the impacts and policies associated with adaptation and mitigation.

Gabon: Following commitments made in December 2009 at the United Nations Conference on Climate Change in Copenhagen, the Gabon government established a National Climate Council. The aim is to develop and strategically direct national policy on climate change, with the goal of drafting a National Climate Plan. A Carbon Reporting tool is already available from Agence Française de Développement (AFD). The Gabonese Agency for Space Study and Observation (AGEOS) is monitoring the forests, the coasts and the land by satellite.

5. Gaps in Climate Change Adaptation Research and Policy in the Central Africa Health Sector

One of the major constraints in African countries for addressing health challenges and climate change challenges in particular is the limited number of trained health workers to ensure the health system's full functionality at all levels. Weaknesses in disease control and climate surveillance and reporting systems make it difficult to obtain the long-term data sets on climate and disease that are necessary for the development of early warning systems in Central Africa (WHO 2005).

Due to scarce resources, Central African governments allocate grossly inadequate funding to health research. Health research is mostly supported by bilateral and multilateral organizations with limited participation of scientists from the home countries, resulting in donor-driven research agendas. Research is conducted fragmentally in separate ministries, sectors and institutions and there are no overarching inter-sectoral or inter-institutional mechanisms for collaboration, exchange of information and knowledge and addressing health priorities. Ministries are unaware of each other's research projects, a situation that contributes to the lack of clearly defined national health research priorities. In addition, priorities for individual research institutions are set internally, rather than in collaboration with other institutions. Furthermore, health practitioners and communities have limited understanding of the effects of climate change on health to undertake appropriate climate change adaptation actions.

6. Stakeholders and Opportunities for Collaboration in Research on Climate Change in the Central Africa Health Sector

The health systems in Central African countries are pyramidal with three levels: central (strategic), intermediate (technical) and peripheral (operational). Stakeholders are local government health institutions, the private sector, NGOs, bilateral and multilateral partners and the communities. . The health systems of most of the countries are suffering from shortage of quantitative and qualitative human capital for proper implementation of health strategies. In many cases, communities are not involved in the implementation strategies of health policies. There is poor coordination between the stakeholders, and climate change adaptation strategies are not precisely defined and integrated into health policies.

Cameroon: The health sector in Cameroon is primarily funded by the national budget, households (cost recovery and other direct payments), external funding and to a lesser extent local government authorities and private health insurance. North-South cooperation is predominant and is carried out through the main specialised agencies of the UN system, the European Union, the World Bank, the African Development Bank and the Islamic Development Bank. Bilateral cooperation is dominated by France's AFD and Germany's KfW Entwicklungsbank and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

Cameroon has many opportunities through the following:

- is politically stable;
- has a vision and a Strategy Paper for Growth and Employment with a horizon to 2035;
- has ongoing reforms in the health system and the fight against disease since the adoption of the Health Sector Strategy (2001-2011); and
- has developed a conceptual framework for health districts, minimum packages of primary care and additional packages of health activities at all levels of the health pyramid.

Updating of the Health Sector Strategy to meet the deadline for achieving the MDGs (2015) includes:

- the implementation of a development emergency human resources plan;
- improving access to medicines, especially in the priority programmes;
- decentralized planning at the district level;
- a health development plan to be implemented under a common programme (Health SWAp);
- the existence of a framework for cooperation partners in health development.

Challenges include the development of human resources necessary for the functioning of health facilities; ensuring access to essential medical products to the most vulnerable; making health districts viable in the context of primary health care; developing a reliable health information system for proper monitoring of progress; reducing the levels of maternal, infant and child mortality by implementing integrated and efficient interventions; scaling up interventions in child survival and health promotion for adolescents; controlling the communicable and non-communicable diseases, including HIV/AIDS, TB, malaria and neglected tropical diseases; making the health system effectively responsive to the health consequences of humanitarian emergencies; and addressing the health determinants and creating favourable conditions for healthy environments.

Gabon: The Gabon health system comprises three sectors with poor formal relationship or complementarities: the civil public health sector, the semi-private sector (National Health Insurance Fund and the National Social Security Fund) and the private sector (including for-profit, non-profit and traditional). Although the health sector has been considered a national priority, very few bilateral and multilateral partners are willing to invest financially in this sector. The few partners who contribute to financing of health and social interventions include United Nations agencies – the WHO, United Nations Children’s Fund (UNICEF), United Nations Population Fund (UNFPA) and United Nations Development Programme (UNDP) – and bilateral partners including France, Italy, the USA and Canada. The private sector is also involved in the health sector but the extent of its contribution is not officially available.

Opportunities include Gabon joining the initiative of Harmonization for Health in Africa, the Ouagadougou Declaration on Primary Health Care and Health Systems in Africa and the Libreville Declaration on Health and Environment in Africa (OMS/AFRO, undated) 2008. The health challenges that WHO has identified with the Health Ministry of Gabon are:

- the reduction of maternal mortality by strengthening emergency obstetric and neonatal care in health facilities as well as the prevention and early treatment of sexually transmitted diseases;

- the reduction of infant and child mortality by improving coverage for all vaccination and scaling of maternal childhood disease management;
- controlling disease by strengthening the surveillance of communicable and non-communicable diseases and better management of the cases; and
- improving the health system through the operability of the health departments, strengthening of hospital medicine and revitalisation strategy of primary health care.

Republic of Congo: Opportunities in Congo Republic are (i) consolidation of peace and stability of political institutions; (ii) improvement of the macroeconomic situation of the country;(iii) political commitment reflected by increasing the resources allocated to the health sector (iv) initiatives related to the introduction of free access to ARV and antimalarial treatments; (v) existence of the PRSP as a framework of reference for the overall implementation of health policy; and eligibility for health financing initiatives at the global level, as well as the debt relief for heavily indebted poor countries (HIPC).

Challenges include creating conditions for the reduction of morbidity and mortality related to communicable and non-communicable diseases and those related to reproductive health; scaling up priority health interventions, particularly those related to malaria, HIV/AIDS and TB and ensuring universal access to populations; strengthening disease surveillance and response systems for emergencies; preventing disability and creating conditions for better integration of people with disabilities; ensuring humanitarian assistance to populations affected by crises; promoting positive health behaviours; and improving access to safe drinking water and waste disposal systems including for biomedical waste in both urban and rural areas.

7. Conclusions and Recommendations

7.1 Conclusions

This analysis of climate change and health revealed that the greatest causes of morbidity in Central Africa are malaria, respiratory tract infections, diarrhoea and HIV/AIDS. Low health workforce densities, weak health systems and inadequate financial resources consistently undermine efforts to reduce the burden of these diseases. The major climate change vulnerability issues of the health sector in Central Africa are related to vector borne diseases, food and water borne diseases and HIV/AIDS. Climate change in Central Africa may have positive or negative effects on vector borne diseases. For example , in cold highland areas, higher temperatures may increase mosquito activity and malaria transmission, while in hot areas it may suppress mosquito activities.

Deforestation can lead to the displacement of malaria vector species by others more competent in disease transmission. Sea level rise in coastal areas may lead to floods which favour the incidence of water borne diseases. Floods, subsequent to sea level rise, will expand the distribution of cholera with enhanced potential for epidemic outbreaks. There is also an association between extreme and frequent weather events (drought and/or flood) and cholera outbreaks. Heat stress also debilitates HIV/AIDS patients' immune systems. There is inadequate

regional, and in countries institutional, coordination of climate change adaptation mechanisms in Central Africa. Projects that address climate change are fragmented and tend to be short-term, donor-driven and sometimes alien to community needs and interests.

Sectors reported by Central African countries in their NAPAs or National Communications to the UNFCCC as key priority sectors for climate change adaptation are agriculture, human health, freshwater resources, coastal zone management, forestry and fisheries. There are very few focused climate change adaptation strategies implemented in the health policies of countries in Central Africa. Current adaptation programs and plans in the health sector include: strengthening management strategies, preventive initiatives, good urban planning, building of flood protection structures, vaccination, insecticide treated bed nets, promoting water treatment and distribution, food refrigeration, chlorination of drinking water, pasteurisation of milk, sanitary slaughter and processing of meat.

7.2 Recommendations

The following recommendations are made to address the major challenges of direct and indirect impacts of climate change in the Central Africa health sector.

- Build up strong public health systems with sufficient number of qualified human resources and infrastructure.
- Generate reliable health and meteorological data to establish a clear understanding of the links between climate change and health and disease mortality.
- Promote communication strategies for better awareness and understanding of climate change health risks at the levels of decision-makers, health practitioners and communities.
- Undertake multidisciplinary and cross sector operational research for a better risk assessment of climate change impacts in the health sector.
- Mainstream potential public health impacts of climate change in national policies and plans.
- Strengthen community based organizations to develop locally owned sustainable strategies for adaptations to climate change in their communities, taking into account local knowledge.
- Promote a gender sensitive approach to interventions on climate and health in cross sectoral disaster risk reduction and preventive health strategies and
- Mobilise national and international funding for vulnerability assessment, risk monitoring and risk reduction activities as well as disaster management institutions.

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