Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles

West and Central African Council for Agricultural Research and Development

CONCEPT NOTE

CORAF/WECARD INITIATIVE FOR A CONSORTIUM TO RESPOND TO THE EUROPEAN FRAMEWORK PROGRAMME 7 AFRICA CALL (FP 7)

THEME 6: ENVIRONMENT (INCLUDING CLIMATE CHANGE)

Activity: 6.2: Sustainable Management of Resources

Sub-activity 6.2.1: Conservation and sustainable management of natural and man-made resources and biodiversity (EUR 28 500 000)

ENV. 2010.2.1.1-1: *Integrated Management of Water and Natural Resources in Africa*

Collaborative Project (small or medium-scale focused research project) for specific cooperation actions (SICA) dedicated to international collaboration partner countries. Max. EC contribution/proposal: EUR 3 500 000 Maximum one proposal can be selected for this topic

Proposed Project title: ***Improving livelihoods by innovative management of natural resources in a changing climate in the River Basins of West and Central Africa***

1. BACKGROUND

The West and Central African Council for Agricultural Research and Development (CORAF/WECARD) is one of the four Sub Regional Organizations that constitute the Forum for Agricultural Research in Africa (FARA). *The mission of CORAF/WECARD is to achieve sustainable improvements to the competitiveness, productivity and markets of the agricultural system in West and Central Africa by meeting the key demands of the subregional research system as expressed by target groups*. CORAF/WECARD is currently composed of 22 National Agricultural Research Systems of West and Central Africa (WCA). These countries have a total area of over 11.5 million km^2 with a population of over 318 million. Most of the rural population in WCA is poor and food insecure and about 70 % of the population in the region depend on agriculture, which accounts for over 35 % of Gross Domestic Product (GDP) and over 40 % of its export. The CORAF/WECARD member countries spread out into three ecoregional zones: Sahel, Humid Forest and Humid Coastal zones, which comprise of valuable and diverse agroecosystems. The following are some of the major ecosystems in the region, which have been a source of livelihood for millions of people but are threatened by unsustainable exploitation and the adverse consequences of the prevailing change in climatic conditions.

The **Congo/Zaire River** basin is the largest river basin of Africa, covering over 12% of the continent and extending over nine countries. The Congo basin is known to be home to over 10,000 species of plants, perhaps 80 percent of which are endemic. The region supports the world's largest assemblage of tropical forest vertebrates consisting about 1000 bird species, and some 400 mammals. The forest provides food, raw materials, freshwater and shelter for over 75 million people and is a major source of wealth for the region (Usongo and Nagahuedi, 2008). The **Niger River** has an associated drainage basin of 2,117,700 km^2 (Gleick 2000). Other important rivers in West Africa include **The Senegal rive**r (1,790 km long) with a basin of about 300,000 km^2 shared among four countries (Senegal, Mauritania, Mali and Guinea); the **Volta River** which stretches 1,600 km and has a basin of about 400,000 km^2 and is shared by Benin, Burkina Faso, Ivory Coast, Ghana, Mali and Togo. The Fouta Jallon highlands of Guinea is the source of both the **Mano River** which runs down to Sierra Leone and Liberia; as well as the **Gambia** river (1,130 km) flowing generally northwest through SE Senegal then west, bisecting The Gambia, to the Atlantic Ocean at Banjul.

The **Guinean moist forest ecoregion** is the major forest block of West Africa and constitutes part of the basin of most of the vast river networks in the region. It extends from Guinea through Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin and Nigeria, and is considered as one of the world's priority conservation areas because of its high levels of endemism. About 2,000 plants and more than 40 mammals are endemic to the ecoregion. The Guinean Forests hotspot is home to an estimated 9,000 vascular plant species and nearly 785 bird species. Fish diversity is quite remarkable in the Guinean Forests hotspot, with more than 510 freshwater fishes, 35 percent of which are thought to be endemic. About a quarter of the world's 350 species of killifish live here, half of which are endemic. The **Lake Chad ecosystem** once held the fourth largest lake in Africa, and the lake was arguably one of the most important ecosystem features in the modern-era African landscape. These rivers support livelihood strategies of both inland and coastal communities in many ways.

2. CHALLENGES AND RESEARCH AREAS

Rivers, forests and the diverse ecosystems support livelihoods of millions of people in the West and Central African region. However, unsustainable use of these ecosystems depletes their capacity to sustainably support the livelihoods of the inhabitants and threatens their existence. Shifting cultivation and grazing although adapted to the physical environment of some WCA countries, are becoming increasingly unsustainable, particularly in the face of rapid population growth. Large tracts of forests are being cleared with adverse consequences on biodiversity. While Africa accounts for only 4 % of global carbon dioxide emissions, more than 60 % of the regions emissions are due to deforestation and land degradation (World Bank, 2009). By 1990, soil degradation was estimated to have affected 500 million hectares or 17 % of Africa's land (UNEP, 1997). The Guinean Forests of West Africa hotspot is one of the most critically fragmented regions on the planet. Only 93,047 km^2, or 15 percent, of its original forest cover remains. There is urgent need to preserve the remaining forest and embark on restoration of depleted areas, which calls for sustainable intensification of crop and animal production systems in the region. This will require improved agroforestry and crop livestock systems that are productive and acceptable to farmers. There is therefore a need to build on existing agroforestry systems taking into account, farmer's indigenous knowledge and the socioeconomic situation.

Climate is hardly a new factor in the region's history, but with global warming, vulnerability of the African continent including the West and Central African sub region is deepening, making it the most exposed region in the world to the impacts of climate change. Climate projections for Africa presented in the Forth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007) include a likely average temperature increase of 1.5 - 4^{o} C in this century, which is higher than the global average

(World Bank 2009). Acting now could help save the 10 – 15 % of species that will otherwise likely be lost in an Africa that is 2° C warmer than pre-industrial levels (Parry et al. 2007). Nicholson (2001) pointed out that the most significant climatic change that has occurred in Africa is a long term reduction in rainfall in the semi-arid regions of West Africa. She shows that while most of the African region has been affected by increased aridity, particularly since the 1980s, the change has been greatest over parts of the Sahel (20 to 40 % between the periods 1931 – 1960 and 1968 – 1997). In the midst of declining rains and aridity, the Sahel region is experiencing sporadic and unprecedented rains. These are causing floods and droughts in hitherto very dry areas with adverse consequences to the livelihoods of particularly farmers. Farmers are therefore required to adjust farming practices to the prevailing conditions. This necessitates the developing and use of appropriate technologies and best bet practices, including innovations to mitigate challenges like shorter growing seasons, extreme temperatures, droughts, floods, which will enable farmers to adapt and become less vulnerable.

Several countries in the region are constructing dams and irrigation schemes to increase food production to feed their growing populations that are increasingly moving to the urban areas. This is bound to create tension among countries sharing these water resources. Several River Basin authorities (Congo River basin, Niger River Basin, the Senegal River Basin, the Volta River Basin, and the Lake Chad Basin) have therefore been established in the region over the years to coordinate use of the water by member countries. However, declining rains in West Africa coupled with increasing use of rivers for both agricultural and domestic uses is posing a huge challenge to sustainable livelihoods in the region. In addition to the loss of valuable biodiversity, degradation of the forests in the river basins has serious adverse consequences on the soils and rivers particularly erosion, increased sedimentation as well as affecting rainfall and therefore influencing water level and flow. Restoring and conserving forests in the river basins will, therefore, improve the river systems and protect the soil and biodiversity. The Lake Chad ecosystem once held the fourth-largest lake in Africa. The Chad basin and its lake has an extraordinary effect on the lives and development potential of large social groups within at least six countries in West Africa. In 1964, the lake measured 25,000 square kilometers. Its size has, however, shrunk to a mere 5 percent of its original size. About 50 percent of the decrease in the lake's size, since the 1960s, is attributed to human water use, with the remainder attributed to shifting climate patterns (Devitt 2001; Coe and Foley 2001). These include persistent drought and water diversion schemes (Odada, Oyebande, and Oguntola 2003). It represents, therefore, one the largest areas in the world at risk, in terms of water quality and availability and the environment. These risks need to be addressed for sustainable development.

Even though climate change research is not as advanced in Africa compared to other continents, appreciable work has been realised in various aspects and in different countries. The Niger River basin in West Africa has received relatively less research and development attention compared to the Congo River and Lake Chad basins. There is urgent need to initiate appropriate research activities that will support conservation of the remaining Guinea moist forest ecoregion as well as restoring this valuable resource. The challenge with the Congo forest is conserving the vast forest area and providing alternative livelihood opportunities, particularly appropriate sustainable intensification of agriculture and attractive incentive packages in trading carbon of the forests. Appropriate mechanism needs also be adopted to outscale valuable research results that have been generated in the Congo basin to the Guinea moist forest ecoregion. There is a general need to ensure that adequate and reliable climatic data is acquired and analysed appropriately to provide the basis for making informed decisions. There is also need to adequately quantify and document the adverse effects of climate on agricultural production and other livelihoods to provide empirical evidence for contextual analysis of climate change in the region. The current and future threats posed by climate change, unsustainable practices in inshore resource use and management, and water resource management, require adoption of an ecosystem based management approach to achieve sustainable livelihoods and biodiversity conservation in the region. It is therefore in this regard that the following areas are being proposed as components for project formulation.

3. GOAL

The goal of this initiative is to contribute to improved livelihoods of the people in West and Central Africa through the development of appropriate technologies and best bet practices that will enable them to meet their food needs and conserve their natural resource base in the face of the challenges of adverse climate change effects.

4. OBJECTIVES

i. Identify appropriate mechanisms for sustained conservation and utilization of valuable flora and fauna of the river/lake basins of West and Central Africa;
ii. Identify and adapt appropriate agricultural best-bets for conserving and utilizing limited water under drought conditions in the Sahel region of West Africa;
iii. Strengthen the innovation capacity of institutions and stakeholders to use modern equipment and techniques in monitoring climate change and its effects;
iv. Promote policy dialogue to enhance the formulation and implementation of appropriate transboundary policies for the efficient utilization of natural resources.

Three project components; one each for the Sahel, humid forest and coastal zones of West and Central Africa are proposed as follows:

Component I: *Improving soil fertility and water conservation for enhanced crop and livestock production in the Sahel of* **Senegal, Mali, Burkina Faso and Chad**

Component II: *Rehabilitation and conservation of degraded Guinea Forest Ecoregion in the* Mano River Union countries of **Guinea, Ivory Coast, Liberia and Sierra Leone**

Component III: *Integrated management of the Congo River basin* of **Cameroon, Central Africa Republic and Congo**

5. EXPECTED OUTPUT/OUTCOME

i. Designated ecosystems mapped and appropriate ecosystem services restored .

ii. Drought mitigation and adaption technologies and best bet practices particularly for the Sahel region made available , to improve productivity and increase farmers' income.

iii. Indigenous capacity to monitor climate change and mitigate its adverse effects strengthened thereby reducing vulnerability of farmers to climate related disaster and improved welfare.

iv. Increased awareness of the value of ecosystem services as well as carbon stocks for income generation.

Appropriate policy options developed and policy dialogue and cooperation on sharing common resources enhanced .

6. BENEFICIARIES

The direct beneficiaries of the proposed project are resource poor producers and entrepreneurs of West and Central Africa.

7. POTENTIAL IMPACT

The proposed project and related activities have the potential to improve management of natural resources in WCA thereby contributing to sustainable agricultural productivity that will lead to improved livelihoods in the region.

8. INSTITUTIONAL ARRANGEMENT

In recognition of the highly diverse and multitude cropping systems and practices as well as the strong heterogeneity in farmers' access to resources, CORAF/WECARD recognizes the need for facilitation of R&D service providers. The focus is on agro-ecological principles and collective learning rather than on technology prescriptions and transfer. The operational mechanism of CORAF/WECARD as a coordinating organization for all National Agricultural Research Systems (NARS) including Farmer's organizations in WCA as well as the strong linkages with International Research Institutes in the region provides the strategic platform for mobilising the required networking to coordinate region wide research endeavours.

In view of the prescribed eligibility conditions of the call: *At least 4 independent legal entities of which 2 must be established in different member States of the EU (MS) or Associated Country (AC) and the other 2 must be established in different international cooperation partner countries (ICPC) from African Caribbean and Pacific Countries (ACP) and the following Mediterranean Partner Countries (African MPC): Algeria, Egypt, Libya, Morocco, and Tunisia*; CORAF/WECARD therefore developed a concept note to invite and solicit expression of interest(s) from the NARS partners and other regional collaborators. Consultations and reviews will be initiated to develop full proposal for submission to the EC before **January 14, 2010**. Project components showing detail activities and costs will be determined with the active participation of relevant stakeholders. Appropriate institutional arrangements for governance and efficient delivery of project outputs will be agreed. Stakeholder roles and responsibilities will also be determined.

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REFERENCES

Butler, Rhett A. "Diversities of Image - Rainforest Biodiversity." *Mongabay.com / A Place Out of Time: Tropical Rainforests and the Perils They Face*. 9 January 2006.

Coe, M.T. and J.A. Foley. 2001. Human and natural impacts on the water resources of the Lake Chad Basin. *Journal of Geophysical Research* 106: 3349-3356.

Devitt, Terry. 2001. Under human pressure, Africa's Lake Chad disappearing. University of Wisconsin News, 27 February. Available online at www.news.wisc.edu/5846.html.

FAO .1993. Forest resources Assessment project, forest resources of tropical Aftica, Part 1: Regional Africa . FAO Rome.

Gleick, Peter H. (2000). *The World's Water, 2000-2001: The Biennial Report on Freshwater*. Island Press. p. 33. ISBN 1559637927

Nicholson SE. 2001. Climate and environmental change in Africa during the last two centuries. In: Desanker P. Ed. Africa and global climate change. CR SPECIAL 8. CLIM Res 17:123-44

Oldeman L.R. 1994. The global extent of soil degradation. In: Greenland DJ, Szaboles T, eds. Soil Resilience and Sustainable Land Use. Wallingford: CAB International.

Odada, E., L. Oyebande, and J. Oguntola. 2003. Experiences and lessons learned: Brief for Lake Chad. Available online at www.ilec.or.jp/eg/lbmi/reports/06_Lake_Chad_27February2006.pdf.

Parry, M., O.F. Canziani, and J.P. Palutikof, P.J. van der Linden and C.E. Hanson . 2007. Technical Summary . In , Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University press.

Reich P.F, Numbem, S.T., Almaraz, R.A.; and H. Eswaran. 2001. Land resource stresses and sesertification in Africa. In: Bridges, EM, Hannam ID, Oldeman LR, Penning FWT, de Vries SJ, Sompatpanit S, eds. Responses to land degradation. Proceedings of the second International Conference on land Degradation and Desertification, Kon Kaen. New delhi, Oxford Press.

UNEP .1997. World Atlas of desertification. 2nd ed. London: Arnold

UNESCO. 1978. Tropical forest ecosystem: a state of knowledge report. UNESCO, Paris

World Bank. 2009. Africa's Development in a Changing Climate