ECOWAS COMMISSION
COMMISSION DE LA CEDEAO
COMISSÃO DA CEDEAO

POLICY BRIEF

March 2023

IMPROVING WATER RESOURCES MANAGEMENT IN THE CONTEXT OF CLIMATE CHANGE

This Policy brief was prepared with support from the Global Climate Change Alliance Plus (GCCA+) West Africa project.

It was produced with the financial support of the European Union and Expertise France supervised its technical development, within the GCCA+ West Africa project.

This Policy brief is published under the sole responsibility of the Department of Economic Affairs and agriculture, as well as the Regional Agency for agriculture and food (RAAF) of ECOWAS and does not necessarily reflect the opinions of the Union European Union, ECOWAS and its Member States.

INTRODUCTION: CLIMATE CHANGE IMPACTS ON AGRICULTURE AND FOOD IN WEST AFRICA

According to the Notre Dame -Global Adaptation Index (ND GAIN), nine countries in the ECOWAS-CILSS region are among the 30 most vulnerable in the world to future climate change[1]. Indeed, for West Africa, climate change is already a reality that makes the maintenance of various agricultural systems increasingly precarious. These changes will continue during the 21st century and beyond, leading to an increase in inter-annual climate variability and in the occurrence and intensity of extreme climate events. In particular, the main climate models predict a clear reduction in rainfall in the rainiest areas (western Sahel), and possible increases in the driest areas (eastern Sahel). Beyond the simple accumulation of rainfall, the distribution of rainfall will tend towards an intensification and regrouping, resulting in a late start and early end of the rainy season with potential breaks in the middle, thus leading to a high vulnerability of rainfed crops, hence the vulnerability of rainfed agriculture. More broadly, changes in the middle and extreme values of climate parameters, increase in frequency of extreme weather and climate events such as floods, droughts, heat waves, will result in reduced agricultural yields in West Africa. By 2050, modeling results show an overall reduction in average yields of 12% (millet), 16% (sorghum), 20% (maize) and 25% (rice) for the main food crops. Groundnut and cowpea yields could decline by up to 25% and 30%, respectively, by 2030. Cash crops (cocoa, cotton, coffee, etc.) will not be spared by these yield changes either. These changes compromise the food security and livelihoods of West African populations. They will also have economic repercussions, with a reduction in GDP of between 3.7 and 11.7% - at least in the absence of adaptation interventions in key socio-economic sectors, including agriculture[2].

VARIOUS PRACTICES THAT CONTRIBUTE TO STRENGTHENING THE ADAPTATION OF THE AGRICULTURAL SECTOR

Since the adoption of ECOWAP in 2005, the consideration of climate issues in regional agricultural policies (in the sense of agro-sylvo-pastoral) has progressed considerably. In addition, regional climate efforts are now under the umbrella of the ECOWAS Regional Climate Strategy (RCS), adopted in 2022, whose objective is to consolidate and complement regional climate actions that are already conducted at the sectoral level in order to structure regional climate action within a common framework. On the one hand, ECOWAP was revised in 2016 with the adoption of a Strategic Policy Framework for 2025, allowing for a first integration of climate issues. In addition, in response to the impacts of climate change on agricultural productivity in West Africa, particularly on small-scale producers, the Economic Community of West African States (ECOWAS) has developed a financial mechanism integrated with the Regional Fund for Agriculture and Food (RFAF) called the West African Initiative for Climate-Smart Agriculture (WAICSA).

[1] ND Global Adaptation Index Project, 2020 : https://gain.nd.edu/our-work/country-index/

[2] http://www.climatestrategy.ecowas.int/images/documentation/Strategie_Regionale_Climat_CEDEAO_avril%202022_FINALE.PDF

In the field, adaptation in the agricultural sector encompasses different sets of practices implemented at various scales - plot, farm, watershed, industry, country - and which can be combined. These practices can be part of agroecology (AE) or Climate Smart Agriculture (CSA). Both approaches have a strong potential for multi-scale climate resilience. This is why they are included in the climate intervention frameworks of ECOWAS and its Member States. Agroecology aims to help family farmers cope with difficult production conditions - soil degradation, climate instability, low and irregular yields - with practices that enhance the potential of ecosystems and contribute to their restoration. CSA is based on three principles that must be achieved together: increased productivity, resilience to climate change, and reduced greenhouse gas emissions.

Although the two concepts are based on different philosophies, the boundaries between AE and CSA are less clear-cut when it comes to the practices that underpin them, and many points of convergence appear in the field. For example, both CSA and AE promote agroforestry, as well as soil and water conservation techniques (zai or half-moons, etc). ECOWAS recognizes the potential of both CSA and AE in the fight against climate change, both of which are included in the climate intervention frameworks of ECOWAS and its Member States (WAICSA), and wishes to encourage the cross-cutting nature of AE and CSA projects for the benefit of greater adaptation. ECOWAS thus supports the scaling up of AE practices that take into account vulnerabilities related to climate change and of WCA practices that are rooted in the territories and that promote sustainable development and the empowerment of small producers.

Whether we are talking about AE or CSA, the issues of capitalization and scaling up are of great importance. If the feedback from the pilot projects implemented between 2020 and 2022 within the framework of GCCA+ WA has shown that spontaneous dissemination is possible within mutual knowledge networks, provided that the innovations have tangible results, there is a strong need to promote and support the dissemination and replication of these practices on a larger scale. This implies identifying the scope of these good practices, but also the necessary socio-economic conditions and the obstacles to be overcome. This policy brief aims to share these experiences and draw lessons for local, national and regional public policies.

WATER RESOURCES MANAGEMENT ISSUES AND CHALLENGES TO ADDRESS CLIMATE CHANGE IN WEST AFRICA

Climate trends over the last decades in West Africa show an increase in rainfall variability since 1970 and a late onset of the monsoon. Since 1980, an increase in cumulative annual rainfall has been observed in some countries except in the Gulf of Guinea - but the number of rainy days is decreasing, meaning more intense rainfall. In the future, precipitation is projected to decrease in the West, while an increase is possible in the East. The climate will become both more prone to drought and aridity - with a drought period that could double in duration by the end of the 21st century compared to the 2000s under the RCP 8.5 scenario[3] - and prone to heavy rainfall and flooding (Source: AR6[4]). As a result of these developments, river flows will be reduced (by 20-40% by 2050), groundwater resources depleted, and agricultural crops severely affected, leading to increased vulnerability of farmers. Adapting to more uncertain water availability conditions will require optimizing water resource management. This is one of the key axes of agro-ecology as well as of Climate Smart Agriculture (CSA).

At the ECOWAS level, integrated water resources management has been a concern of decision makers since 2008. The WAPR (Regional Water Resources Policy for West Africa) was then broken down into implementation plans (WAPR-WAPR) (2013-2016) and then into Regional Action Plans for Integrated Water Resources Management (RWRM), which expired (2015-1017). More recently, an IWRM action plan was developed in 2019, for the period 2019-2030.

On the ground, adapted agricultural practices can contribute to better water resource management. Examples include (i) securing water resources mobilization through collection and distribution systems, (ii) photovoltaic pumping, which also contributes to climate change mitigation, (iii) implementing localized irrigation systems, (iv) optimizing agricultural calendars to operate in both dry and wet seasons, and (v) conserving soil water at the plot level by improving soil structure. Integrated approaches combining several elements appear to be the most effective.

Various field projects have been able to experiment with the deployment of adaptation solutions aimed at better management of water resources. They have confirmed certain practices, as we will see in the examples below, and have provided lessons for their dissemination on a larger scale.

SHARING OF FIELD EXPERIENCES DEVELOPED IN THE FRAMEWORK OF GCCA+ WA: TAKEAWAYS AND MULTIPLE SCALES LEVERS

Among the 15 CSA pilot projects selected and supported between 2020 and 2022 under the GCCA+ WA project, several focused on improving water resources management in a climate change context.

[3] The RCP scenarios are reference scenarios for modeling future climate. The RCP 8.5 scenario is a pessimistic scenario in which emissions continue to increase at current rates.

[4] The AR6 (Assessment Report) corresponds to the 6ème IPCC report.

Experienced solution - COUNTRY	System of Rice Intensification (SRI) - Multi-country

The system of rice intensification reduces the need for crop irrigation, with transplanting of seedlings at the 2-leaf stage into wet, non-flooded rice fields with intermittent irrigation alternating between periods of moderate flooding and dry periods. This technique allows for better water management and a reduction in the amount of seed. Several pilot projects have implemented this technique. They also combine it with hydro-agricultural development or capacity building.

The various SRI experiments highlight the need for capacity building of small farmers on these techniques but also the need to develop agricultural extension services. Here again, peer-to-peer exchanges appear to be promising.

Necessary conditions	- Farmers who are aware of the issues related to climate change and are inclined to modify their practices and change their traditional methods - Networks of rice farmers organized and structured to disseminate practices - Access to mechanization of the crop (weeding in particular, but also the planting of the trays)
Barriers to implementation	- The lack of water control in the lowlands, the absence of development makes it difficult to deploy SRI (rice farmers reported that even with the application of the SRI method, water shortages at the beginning of the cycle and floods in the middle of the cropping season will only be controlled if the lowlands are developed (hydro-agricultural infrastructure, mini-dams, sills, etc.).
Policy levers to encourage its implementation	**Local**: - The organization of rice cooperatives capable of taking charge of training trainers for leading farmers selected from among the community's members - Capacity building of small farmers on SRI techniques, but also of agricultural extension services agents and their organization in support-advisory groups specialized in SRI techniques and advice. - Develop technical guides and/or practical manuals on SRI techniques in local languages **National**: - Organize field visits and direct exchanges (monitoring tour) between producers on their experiences with SRI. - Strengthen the involvement of rice apex organizations and the private sector in the upstream part of the value chain. The processing and promotion of rice at the national level, particularly by relying on the skills of the private sector, is one of the focuses of the Rice Offensive (2014).
Leviers politiques pour favoriser sa mise en place	**Régional** : - Pour démultiplier les connaissances obtenues pendant les ateliers régionaux consacrés au SRI, des formations de formateurs et de paysans en cascade devront être organisées par les ministères de l'agriculture dans chacun des pays de la région de la CEDEAO, à partir du partage d'expérience effectué au niveau régional. - Renforcer le partage d'expérience entre pays. En effet, dans certains pays comme le Bénin, Togo et Mali, la technique est déjà largement répandue, contrairement à la Guinée, la Côte d'Ivoire ou le Liberia où l'introduction du SRI est plus récente. - Dans le cadre de l'offensive Riz de la CEDEAO, le partenariat pour le développement de systèmes durables de production rizicole en Afrique sub-saharienne a promu le SRI dans 5 états CEDEAO; ce programme pourrait être étendu à d'autres pays.

Experienced solution - COUNTRY	Smart Valley Approach - BENIN

The Smart-valleys approach is a low-cost, participatory approach that uses farmers' knowledge to develop lowlands for rice-based farming systems. The approach follows a step-by-step procedure that focuses on the design, development and construction of low-cost water control structures, taking into account socio-economic and biophysical factors.

For example, in a pilot project in Benin implemented by ECLOSIO ASBL and supported by GCCA+ WA, bunds have been put in place that retain water longer in the boxes. The main benefits are increased water retention in their fields, reduced risk of fertilizer loss due to flooding and increased rice yields. The approach increases water control.

This approach has been combined with the promotion of the SRI technique, which reduces the need for irrigation of crops, and the use of short-cycle varieties (IR 841 rice), as well as the promotion of Biochar. This approach has been combined with the promotion of the SRI technique, which reduces the need for crop irrigation, and the use of short-cycle varieties (IR 841 rice), as well as the promotion of Biochar, a practice that conserves soil moisture, and the planting of Moringa and Gliricidia around irrigated areas (agroforestry), which lowers local temperatures and wind speed, and thus reduces water evaporation from the soil (maintaining soil moisture in plots that are located in higher elevations than in the lowlands).

This experiment demonstrates that:

- the combination of different practices allows a reduction of water inputs,

- Farmer leaders will play an important role in sensitizing their peers to the benefits of the Smart-Valley approach and helping them to introduce these CSA practices and technologies in their context.

Necessary conditions	- Adapted lowlands: adapted site selection - Accessibility in leveling equipment - Access to input and output markets, an efficient input distribution system - Secure land tenure
Barriers to implementation	- Insufficient extension services or outdated knowledge - Unstable land tenure that discourages long-term development

Policy levers to encourage its implementation	**Local :** Train facilitators on CSA/AE practices who will then be the endogenous farmer-relays at the local level. - Establish contracts with local radio stations to broadcast radio spots on the SV approach to farmers, but also to extension workers (mass information). - Organize awareness/information workshops in the form of informed debates at the commune level and make the approach known to political decision-makers (deputies, regional councils, mayors,) **National:** - Contract with training institutes to provide training of trainers in farmer field schools (FFS). These trainers, who will have been trained in the practice of Smart-Valley, will then train endogenous facilitators in the RWH approach. **Regional**: -Set up training programs for decentralized government services on the challenges of climate change for agriculture

TAKEAWAYS FOR ECOWAS AND ITS MEMBER STATES

SRI practices, Smart Valley approaches, but also hydro-agricultural developments and measures proposed by the projects (reservoir techniques, drip irrigation, etc.) deserve to be known and disseminated. On the other hand, these proven solutions are deployed on limited areas. Scaling them up therefore requires, on the one hand, a reflection on the management of uses at the level of a territory and on land use (zoning of the territory and land rules allowing to limit conflicts of use of resources). It must be integrated into an integrated and concerted management of water resources. Water management investments and usage plans must take into account the current and future impacts of climate change in order to avoid poor infrastructure design that is not adapted to future climate conditions.

Finally, the participatory planning dimension of agricultural, pastoral and, more broadly, natural resources is an important lever for ensuring the sustainability of the practices promoted and their dissemination.

At the regional level, management frameworks have been established. The Water Resources Management Coordination Center (WRMC) is responsible for supervising ECOWAS activities in the field of water management and develops numerous programs and projects for integrated water resources management, including the Regional Water Observatory. The Observatory can thus help strengthen knowledge on water resources and the impacts of climate change, and organize training of trainers to disseminate this knowledge in the Member States.

In addition, the Regional Climate Strategy adopted mid 2022 by ECOWAS Member States is expected to result in the operationalization of integrated water resource management integrating climate change impacts at the regional level. The capitalization of these combinations of solutions could be disseminated to Member States in order to better integrate climate change issues into their IWRM.

There is a role **for the national level**, especially in light of the projects that have been experienced:

- Direct and channel investments and the interest of technical and financial partners to scale up proven hydro-agricultural developments and measures, such as SRI and Smart Valley type approaches

- Establish integrated water resource management systems that guarantee a concerted approach with the communes, local government services and farmers' organizations

- Encourage the involvement of training institutes to deploy broader capacity building on these techniques.

- Promote the «Agriculture - Climate - Water Nexus» approach.

#ECOWAP2025

Département Affaires économiques et Agriculture
Direction Agriculture et Développement Rural
Agence Régionale Pour l'Agriculture et l'Alimentation
Annexe River Plaza – 496 Abogo Largema Street - Central Business District
PMB 401 Abuja FCT – République Fédérale du Nigéria

agric_ruraldev@ecowas.in
araa@araa.org

@ecowas_agric
@ARAA_CEDEAO

@ecowas.agriculture
@araaraaf

www.ecowap.ecowas.int
www.araa.org