CLIMATE SMART AGRICULTURE IN NIGERIA

Although small-scale subsistence agriculture is a minor contributor to climate change, the impacts that climate change has on it become increasingly visible and understood.

Without proper adaptation, these negative impacts will lead to increased numbers of undernourished people (IPCC, 2019). The reason why small-scale farming systems are highly susceptible to climate change and variability is that they are predominantly rainfed and climate dependent (Cohn et al., 2017).

Nigeria, a predominantly agricultural country (70% of its population are engaged in farming) with a largely subsistence-based agricultural sector (88.4% are small holders) and a very rapidly growing population (Cervigni et al., 2013, UN 2022). Nigeria is one of the eight countries in the world that will concentrate more than half of the increase in world population projected by 2050 (UN 2022). Indeed, Nigeria's population, currently the sixth largest in the world, is expected to become the third largest in the world by 2050 (UN 2017), resulting in further pressure on the farming sector and natural resources.

As a response for the need to increase food security without compromising environmental quality and in support of the Paris Agreement on climate change, FAO developed the concept of Climate Smart Agriculture (CSA) (FAO, 2018, IPCC, 2019). Climate smart agriculture (CSA) is an approach to transform farming that aims to deliver positive outcomes on three impact pillars, namely, intensification, adaptation, and mitigation to support food security under the new realities of climate change (Lipper et al., 2014, Taylor 2018).

The climate-smart agriculture (CSA) concept reflects an ambition to improve the integration of agriculture development and climate responsiveness. It aims to achieve food security and broader development goals under a changing climate and increasing food demand. CSA

initiatives sustainably increase productivity, enhance resilience, and reduce greenhouse gases (GHGs), and require planning to address tradeoffs and synergies between these three pillars: productivity, adaptation, and mitigation. (FAO, 2010). While the concept is new, and still evolving, many of the practices that make up CSA already exist worldwide and are used by farmers to cope with various production risks (FAO, 2013).

Some CSA practices (e.g. intercropping/multiple cropping, agroforestry, conservation agriculture etc.) are quite widespread and their proliferation has been facilitated by ease of adoption, and multiple benefits such as food, income diversification and improved resilience. Although there are a wide range of organizations conducting CSA-related work in Nigeria, most have focused largely on food security, environmental management and adaptation FAO (2019).

Challenges Limiting Implementation of CSA practices in Nigeria

Despite substantial efforts to mainstream climate change adaptation into its developmental agenda and policies, Nigeria is still grappling with challenges in achieving the desired results. Some of these challenges include funding, capacity building, and poor technical skills. Other challenges include lack of synergy, coordination and collaboration by stakeholders, and a lack of target-setting, monitoring, and evaluation, which gave room to overlaps, duplication of efforts and a greater cost burden. Poor communication is another problem reducing the effectiveness of adaptation efforts in the country. The lack of active involvement of the sub-national governments (especially the local governments) and indigenous people constitutes a major barrier to effective and inclusive NAP implementation in the country.

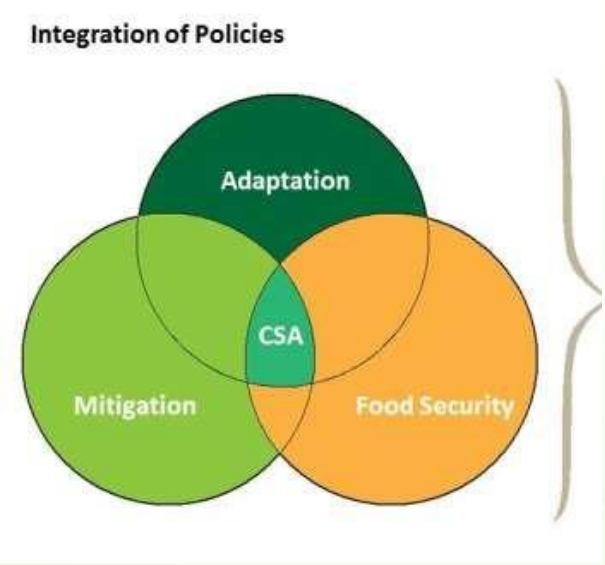
Nigeria has limited domestic resources to finance climate change adaptation activities. The country's budget is primarily focused on addressing immediate development needs, leaving limited funds for long-term adaptation planning and implementation. However, the government is committed to increasing its financial commitment to adaptation, and it has developed a number of strategies to mobilize additional resources (UNFCCC, 2021).

One of the key strategies for mobilizing additional resources is to access international climate finance. Nigeria is eligible for funding from a number of international climate funds, including the GCF, the Adaptation Fund (AF), and the GEF. The government is working to strengthen its capacity to access and manage these funds, and it is also developing a number of national adaptation programs and projects that are eligible for international funding. In addition to international climate finance, Nigeria is also exploring a number of other innovative financing mechanisms for adaptation and these includes:

- Risk pooling and insurance: This involves pooling funds from a number of sources to provide financial protection against climate-related risks.
- Results-based financing: This provides financial incentives for achieving specific adaptation outcomes.

- Public-private partnerships: This involves leveraging private sector resources to finance adaptation activities.

There is the need to also integrate mitigation into the state's climate-smart agricultural development efforts. In addition, off-farm services related to CSA need to be enhanced, including weather-smart and market-smart services. While funding for CSA is limited in the state and Nigeria in general, efforts are underway to ensure that the country access and utilize international climate finance from sources such as the Green Climate Fund and Global Environment Facility (CPI, 2022).



One of the key sources of international climate finance for Nigeria is the Green Climate Fund (GCF). The GCF is the world's largest dedicated climate fund, and it has approved over USD 150 million in funding for projects in Nigeria. These projects cover a wide range of activities, including renewable energy, energy efficiency, climate-smart agriculture, and forest conservation (UNFCCC, 2021).

Climate-smart agriculture (CSA) helps promote sustainable and resilient agricultural practices in the face of climate change. It encompasses three pillars: increasing productivity and income, enhancing adaptation to climate change and reducing greenhouse gas emissions. CSA integrates traditional knowledge with modern technologies to optimize resource use, conserve biodiversity, and foster climate resilience in farming systems. Some important aspects to note in CSA adoption include:

Climate-resilient crop varieties – Developing and adopting climate-resilient crop varieties is fundamental for ensuring food security in the face of changing climatic conditions. Nigerian farmers are increasingly utilizing improved seeds that are drought-tolerant, disease-resistant and have shorter maturity periods. These varieties offer higher yields, reduce vulnerability to climate variability, and enhance farmers' capacity to adapt to changing conditions.

Efficient water management – Water scarcity is a growing concern in Nigeria, exacerbated by climate change impacts. Climate-smart agriculture promotes efficient water management practices, including rainwater harvesting, drip irrigation, and mulching. These techniques optimize water use, minimize water loss, and enhance crop productivity, particularly during periods of drought or irregular rainfall.

Renewable energy integration – Renewable energy plays a vital role in climate-smart agriculture, providing sustainable power sources for irrigation, processing, and storage. Solar-powered water pumps, biogas digesters, and energy

efficient technologies are being adopted to reduce reliance on fossil fuels and decrease greenhouse gas emissions. Encouraging the use of clean energy in the agricultural sector contributes to climate change mitigation and fosters a greener agricultural value chain.

Farmer education and capacity building – To promote the adoption of climate-smart agriculture practices, farmer education and capacity-building initiatives are crucial. Training programs, knowledge-sharing platforms, and farmer field schools help disseminate information on sustainable farming techniques, weather forecasting, and climate risk management. Empowering farmers with knowledge and skills strengthens their resilience and facilitates the wider adoption of climate-smart agriculture across Nigeria.

Nigeria can enhance agricultural productivity, reduce vulnerability, and contribute to climate change mitigation. It is essential for policymakers, researchers, farmers, and stakeholders to collaborate in promoting climate-smart agriculture as a key strategy to ensure food security, economic growth, and environmental sustainability in Nigeria's agricultural sector.

Nigeria is an active global participant in addressing climate change, being a highly vulnerable country with a very high population. The country has developed all the necessary instruments (strategies, policies, and action plans) as well as the right legal and institutional frameworks to enable it to meet its international obligations on climate change actions (including adaptation actions) (UNFCCC, 2021)

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