

The role of STI in advancing agricultural development and food security in developing countries

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Participants

I have the singular honor of addressing you all today at this Regional CropWatch Training Workshop, organized by the United Nations Conference on Trade and Development (UNCTAD), in collaboration with the Aerospace Information Research Center of the Chinese Academy of Sciences (AIRCAS), the Alliance of International Science Organizations (ANSO), and National Space Research and Development Agency (NASRDA). We gather here in Abuja, the heart of Nigeria, united by a shared commitment to advancing agricultural development and food security in our region. This gathering signifies our collective commitment to harnessing cutting-edge technologies to transform agriculture, a sector that is the backbone of our economies and the lifeline of our communities. Today, I would like to discuss **THE ROLE OF SCIENCE, TECHNOLOGY, AND INNOVATION IN ADVANCING AGRICULTURAL DEVELOPMENT AND FOOD SECURITY IN DEVELOPING COUNTRY.**

According to United Nations projections, the world population will rise to 9.5 billion by 2050, with most growth occurring in developing countries. The Food and Agriculture Organization (FAO) estimates that food production must increase by 70% to meet this demand. Over 800 million people, mostly smallholder farmers, go to bed hungry each night. Agriculture is vital for many developing economies, providing livelihoods and improving food security for 80% of the world's poor who live in rural areas and primarily engage in farming.

Agricultural growth has shown to be at least twice as effective in reducing poverty compared to growth in other sectors. Despite its economic importance, agriculture faces numerous challenges, such as poor land tenure systems, inadequate irrigation, climate change, land degradation, inadequate technology, high production costs, inefficient input distribution, limited financing, high post-harvest losses, and poor market access. To meet the demands of growing

populations and to overcome these challenges, food production must increase and more efficient methods must be adopted.

In this context, Science Technology and Innovation (STI) plays a crucial role in transforming agriculture and enhancing food security. It provides the tools and methods necessary for a sustainable agricultural future by providing up-to-date information on sustainable farming practices through scientific research. This ensures that agricultural activities preserve natural resources and protect the environment for future generations thereby enhancing extension services providing farmers with access to information, advisory services, and training.

Technology bridges the gap between scientific research and practical application, enabling the implementation of innovative solutions. Space technology is significantly impacting agriculture and has the potential to transform the sector by 2030. The key role of space technology is in precision agriculture. By utilizing GPS, drones, satellite images, and data analytics to optimize resource use and reduce environmental impact by minimizing waste and preventing overuse, space technology provides data on crop phenology, plant nutrition, water optimization, soil health, crop health, and yields. This helps farmers monitor and improve crop production, reduce costs, and ensure all-year-round agricultural production. In addition, satellite images are used to create various maps such as land suitability maps, agroecological zone (AEZ) maps, and other land use maps providing useful and timely information related to land use and land cover change aiding in the sustainable development and management of land resources.

The integration of STI in agriculture aligns with NASRDA's mandate to use space-based technology for sustainable agriculture and has led to a collaboration with the AIRCAS aimed at customizing the CropWatch System for Nigeria to achieve SDG 2 that focuses on ending hunger, achieving food security, and promoting sustainable agriculture. By leveraging STI, developing countries can enhance food production, reduce poverty, and improve agricultural value chain.

satellite-based systems like CropWatch, China's leading agricultural monitoring system, use remote sensing and ground observation data to evaluate crop growth, yield, and related information at both national and global levels through the CropWatch Innovative Cooperation Programme (CropWatch ICP). CropWatch Cloud provides open and customizable agricultural production information services (APIS) that allow stakeholders worldwide to calibrate, localize, customize, and automatically generate agro-climatic and agronomic indicators based on their specific requirements, such as area, phenology, and crop type. These technologies help in early warning detection, enabling timely interventions and reducing the risk of crop failure. Consequently, STI increases agricultural productivity and builds resilience against climate change, ensuring a stable and secure food supply.

In conclusion, the advancement of agriculture through Science, Technology, and Innovation is essential for developing countries. It holds the potential to enhance agricultural mechanization, thereby reducing labor intensity and improving market access. Additionally, it enables evidence-based policy-making, supporting the formulation of effective policies that ensure food security and improve livelihoods.

As we move forward, let us embrace the transformative power of Science, Technology, and Innovation to create a future where agriculture in developing countries is resilient, productive, and sustainable. By working together, we can achieve food security, improve livelihoods, and contribute to the overall development of our communities and nations.

Once again thank you UNCTAD, AIRCAS and ANSO for the support given to cropwatch Nigeria.

Thank you.