Digital Technologies for Agricultural Transformation

Background and Context

Innovative digital technologies for 'smart' farming can help improve yields, efficiency and profitability, resulting in the transformation of value chains (World Bank, 2011). Agriculture is critical to achieving Africa's development goals, but business-as-usual farming will not help to overcome the challenges that the continent faces in transforming the sector. The potential of information and communication technologies (ICTs) is recognised in many national agricultural strategies, but adoption of technology remains limited and the continent is not yet maximising the benefits of innovations (CTA, 2014).

The use of digital technologies, including computers, mobile phones, satellites, crop sensors and drones, can play a key role in achieving all of the commitments made under the Malabo Declaration. Digital technologies aid greatly in the generation, analysis and use of data and information – as is explicitly recognised in the CAADP Results Framework[1]. Application and exploitation of digital technologies should therefore be strongly embedded in National Agricultural Investment Plans (NAIPs). Much more needs to be done by African states to capitalise on digital innovations if the accelerated growth and agricultural transformation that is required is to be achieved. Smart farming for the future will require smart digital decisions as well as corresponding policy implementation.

KEY MESSAGES

Digital technologies can play a key role in transforming African agriculture, accelerating growth and improving livelihoods on the continent. AU Member States must put in place effective strategies to develop ICT connectivity and their affordable usage in rural areas, while also promoting data-enabled agriculture. Stronger collaboration must be secured with the private sector – including African digital start-ups – and donors, with particular attention paid to enhancing the effectiveness of agricultural digital innovations.

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1 See CAADP Results Framework 2015-2025, element 3.6

Challenges to the Effective Use of Digital Technologies with Regard to Achieving Malabo Declaration Commitments

- **Increasing food security and boosting intra-African trade**

  In 2012, formal intra-African trade made up just 11% of the continent's trade, and an already high food import bill is estimated to rise to over US$115 million by 2050 (AfDB, 2016). A key constraint to improving trade is inadequate information on markets, policies and regulations (AU, 2017). Many digital tools currently developed help enhance productivity, reduce post-harvest losses, better manage irrigation, ensure nutrition security and boost regional trade, in large part by improving the collection and transfer of information. For example, Geographic Information System (GIS) technology attached to trucks is now used to track movement of goods and enhance traceability. This technology can be linked to border systems for clearing goods. However, uptake is challenged by inadequate knowledge of the most effective tools, costs of access to the technologies, digital illiteracy, poor connectivity in rural areas, weak government investment in their adoption and the often short-term timeframes of donor-funded projects. Although most African countries have acknowledged the potential of digital technologies for overcoming such challenges, adoption and implementation remain limited. Many projects remain at proof-of-concept level and their scaling up is inadequately addressed.

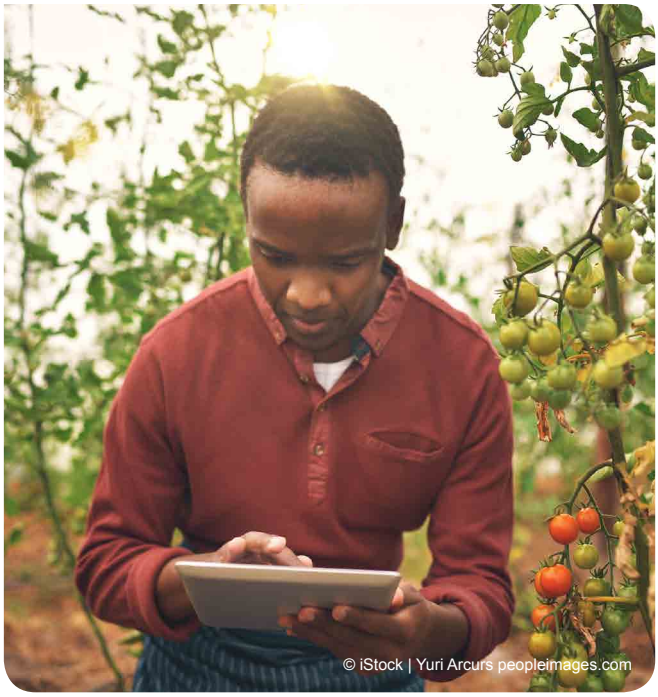
- **Enhancing investment in agriculture** *(see also: Knowledge Note Agricultural Finance)*

  Less than 1% of commercial loans currently target the agricultural sector (IFC, 2018). This means that smallholders and agribusinesses have insufficient access to the financial resources needed to improve their livelihoods.

  Financial technology (or 'fintech') start-ups and telecom operators in Africa have launched world-class innovations that are increasing financial inclusion and access to investment for farmers. Examples include the mobile payment system MPesa in Kenya and the financial management platform Mobis in Uganda. However, African banks have been slow to adopt digitalisation, and collaboration among public and private fintech stakeholders remains weak. This has resulted in missed opportunities for interacting more effectively with financial markets and integrating new practices – such as data analytics for credit-scoring in order to reduce default risks.

- **Enhancing resilience to climate variability** *(see also Knowledge Note: Climate-Smart Agriculture)*

  Agriculture and food security are negatively impacted by the adverse effects of climate change. Extreme weather conditions result in the disruption of planting seasons and impact on harvests. Although new technologies and tools for building climate resilience have emerged, adoption is challenged by factors such as the complexity of building sensors which can



accurately predict weather conditions, lack of data to carry out local and customised analytics and the cost of remote-sensing devices.

- **Opportunities for youth and women** *(see also: Knowledge Notes: Women Empowerment; ATVET)*

  Although commitments under the Malabo Declaration state that 30% more jobs need to be created for youth and the engagement of young people and women in profitable agribusinesses needs to be improved, digital technologies are not being sufficiently leveraged to enable job creation for youth in agriculture (AGRA, 2015; CTA *et al.*, 2014). Constraints to supporting the engagement of youth and women in agribusinesses include digital illiteracy, inadequate connectivity in rural areas and, particularly for rural women, cultural barriers, lower levels of education and lack of financial and digital assets (FAO, 2018).

- **Tracking progress toward meeting the Malabo commitments** *(see also Knowledge Note: Biennial Review)*

  Many African governments face important challenges in managing data and information systems in order to adequately deliver and report on their delivery of Malabo Declaration commitments. Improved management of agricultural strategies is constrained by poor data-enabled statistical capacity. The 2017 Biennial Review process of tracking Malabo commitments showed that, at all levels, many stakeholders faced challenges in collecting and analysing data. Another key weakness identified was the inability to capitalise on digital platforms to share and apply lessons and good practices.

Recommendations for Embedding Digital Technologies Within NAIPs

It is advisable that relevant programmes designed and implemented within the framework of NAIPs take into account the following key recommendations in order to achieve the Malabo commitments:

- **Increasing food security and boosting intra-African trade**
  - Governments must integrate the adoption of digital tools within all agricultural sector programmes and strategies, including implementing relevant capacity-building programmes. Particular attention should be focused on tools and programmes supporting innovative mechanisation, land management, smart irrigation, reducing food waste and enhancing nutrition security.
  - Governments must modernise market information systems by improving the inclusion of digital technologies in their operations. Particular attention must be granted to systems devoted to priority commodities. ICT-based warehouse receipt systems and agricultural commodity exchanges need to be promoted and modern regional and continental market information systems need to be developed to support intra-African trade.

- **Enhancing investment in agriculture**
  - The growth of digital financial services – including mobile money services, crowdfunding and blockchain, a digital ledger that facilitates transparent and unfalsifiable transactions – are improving financial inclusion. In order to maximise the potential of these technologies to boost inclusive agricultural investment, AU Member States must support their wider deployment within the agricultural sector by strengthening the institutional frameworks for digital financial services. New tools and schemes such as blockchain, data-supported creditworthiness scoring and farmer profiling should be promoted.

- **Enhancing resilience to climate variability**
  - Data acquired through the use of the internet of things (IoT) – i.e. the internet of computing devices embedded in everyday objects, enabling them to send and receive data – as well as the use of remote-sensing technologies such as drones and satellites can enable crop farmers, pastoralists and fisherfolk to become more resilient to climate- and weather-related disasters and risks. Strategies must be established which strengthen national and regional capacities and

develop appropriate equipment in this field. More effective collaboration should be encouraged between global and national data and satellite service providers. Relevant index-based insurance schemes for farmers also need to be implemented.

- **Opportunities for youth and women**
  - In order to expand agribusiness opportunities for young people and women and increase job creation, African governments need to better support the use of digital technologies by establishing or expanding digital literacy programmes, facilitating access to affordable digital services and promoting youth digital entrepreneurship in agriculture.

- **Tracking progress toward meeting the Malabo commitments**
  - In order to better track progress toward meeting the Malabo commitments, strengthening systems for CAADP programme delivery and ensuring mutual accountability, governments need to invest in digital platforms for data collection, management and reporting for decision making. They must also ensure capacity building for those involved in CAADP and NAIP-related processes. These tools include computer-assisted personal interviewing, data collection through mobile applications and online repositories. The AU has already taken an important first step in this direction at the continental level by digitising data collection for CAADP Biennial Reviews through an online entry system which is linked to a cloud-based database called 'e-BR'.
  - Indicator data should be made available as part of a country's open data agenda, taking account of standards and opportunities for linked open data solutions such as the Government Open-Up Guide for Agriculture developed by the GODAN initiative - see https://bit.ly/2Rk8AZu. In order to ensure successful delivery and use of data, alliances should be built with partners to support data and knowledge exchange across platforms.

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Published by: African Union Commission - Department for Rural Economy and Agriculture (AUC-DREA) and African Union Development Agency – NEPAD

Prepared by: Technical Centre for Agricultural and Rural Cooperation (CTA) - Led by Ken Lohento

Designed by: Twaai Design

Supported by: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

ISBN-Number: 978-0-6399233-3-8

Date: June 2019