MALABO MONTPELLIER PANEL

Morocco

BYTE BY BYTE

Policy Innovation for Transforming Africa's Food System with Digital Technologies


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The Government of Morocco has been ambitious in carefully designing policies and regulations that can promote greater ICT penetration and the provision of ICT services to different sectors of the economy, including the agriculture sector. The country's EBA ICT score[i] of 6 out of 9 indicates a strong enabling digital environment with regards to laws, regulations and policies, while its score of 58 in the GSMA Mobile Connectivity Index (MCI)[ii] highlights its strength to adopt and use mobile internet. This achievement is largely due to the government's commitment at institutional and programmatic levels to creating an enabling environment for digitalizing its economy, including the agriculture sector.

Institutional innovation

Morocco has several institutions that oversee the uptake of digitalization across its economy. The Moroccan Telecommunications Regulatory Agency (ANRT), created in 1997, oversees the granting of telecom licenses, implementing ICT frameworks and developing legislative and regulatory frameworks for ICT development and to increase the affordability and quality of telecommunications services. ANRT also supports skill development and training and promotes research for innovation and the growth of the telecommunications sector.[1] The Ministry of Economy and Finances also contributes to digitalization uptake by leading the preparation of taxation and finance laws as they relate to

i The EBA ICT indicator measures laws, regulations and policies that promote an enabling environment for the provision and use of ICT services, particularly in rural areas. The index ranges from 0-9 (9 indicating high performance). An index equal or higher than 4.5 is identified as 'developing' and 'prospering' in the regulatory framework performance and therefore considered as high performers in our cluster.

ii The GSMA Mobile Connectivity Index measures the performance of 163 countries (44 African countries), against the four key enablers of mobile internet adoption – infrastructure, affordability, consumer readiness and content and services. The index ranges from 0-100 with 100 indicating high national capacity to support the adoption of mobile internet.

ICT use.[2] Furthermore, the Ministry of Industry, Investment, Trade and Digital Economy oversees the design and implementation of government policy related to monitoring and promoting the use of ICTs and investment in the ICT sector through the Agency of Digital Development (ADD), housed within the ministry.[3] The ADD empowers public administrations, companies and citizens to use digital tools and services.[4] In addition, Morocco has emphasized equipping public agencies in charge of agricultural development with ICTs to achieve a high-quality and timely service provision. The Regional Offices of Agricultural Development (ORMVA), situated within the Ministry of Agriculture, are responsible for research, project execution and management of hydro-agricultural equipment, management of water resources for agricultural use, and dissemination of new farming technologies. To achieve their mission, the ORMVA have been equipped with computerized tools that enhance their technical capacity to conduct computer-assisted maintenance of irrigation systems and invoicing for water used for irrigation.[5]

Since 1998, the government has also implemented several reforms to liberalize and privatize the ICT sector. These reforms greatly benefited the Moroccan economy and significantly increased the number of people with mobile subscriptions. In 2009, Morocco joined the World Trade Organization (WTO) Information Technology Agreement that removed all tariff barriers on ICT products. In addition to reduced equipment costs, the strong presence of telecom operators in ICT retailing has also helped to boost ICT penetration, including mobile phones, by lowering barriers to access.[6]

Policy and programmatic innovation

ICTs have been in use across numerous sectors of the Moroccan economy and earlier than in many other African countries. However, until recently there was no dedicated digitalization strategy for the agriculture sector. The *Note d'Orientation Generale* (NOG) was designed as a roadmap for all the stakeholders in the ICT sector and aims to sustain the growth and use of ICTs to reduce the digital divide, while also ensuring the implication of all stakeholders. For the period 2015–2018, it aimed to expand universal access to broadband and high-speed broadband. To do so, the NOG supported service providers by strengthening the market and promoting the development of models of infrastructure sharing, particularly in less densely populated rural areas. Finally, the NOG leveraged regulation to open some segments of the telecommunication market to competition, especially business services.[7]

In 2016, Morocco implemented the Digital Morocco Plan (PMN) to meet its aspiration of achieving emerging-economy status by 2020. The PMN emphasizes efficient data transport and processing infrastructure for implementing a digital economy. To achieve this, the PMN encourages new investments in broadband and high-speed broadband infrastructure (fixed and mobile) and the completion of the liberalization process in the telecommunication sector. Furthermore, the PMN recognized the importance of strengthening digital literacy for a rapid digital transformation and Morocco's position as a regional digital hub.[8]

Under the *Plan Maroc Vert* (PMV), ICT-based technologies for agricultural advisory services have been developed to provide extension services to smallholders. In 2014, Morocco put in place Ardna, a training, research, advisory and communication network under pillar II of the PMV, which is dedicated to coherent development of small-scale agriculture. The program was implemented through a partnership between departments of the Ministry of Agriculture and Maritime Fisheries (MAPM) at national and regional level, the Food and Agriculture Organization of the United Nations (FAO), and farmers and women in rural areas. Ardna is a virtual network for providing advice, research and communication guiding the implementation of the PMV. Through the user-friendly platform, farmers can seek advice from researchers and agricultural extension agents on agricultural best practices and farming techniques. The program facilitates knowledge-sharing and creates links and synergies among all actors in the agriculture value chain. It also enhances competitiveness of farmer organizations through improving their skills and knowledge-base.[9,10,11]

Under a partnership between MAPM and the *Office Chérifien des Phosphates* Group signed in 2007, ICTs were used to develop a tool promoting the smart and sustainable use of fertilizers. Moreover, a project—Soil fertility map of cultivated soils in Morocco—that is part of PMV was implemented by the National Institute of Agronomic Research (INRA) in collaboration with the Hassan II Institute of Agronomy & Veterinary Medicine and the National School of Agriculture of Meknes. The soil fertility map depicting pedological data was created using geographic information systems and is openly accessible on the internet. The project also developed a computer system for improving the capacity of agricultural advisors, extension agents of the MAPM and other actors in soil analysis and crop fertilization management. The soil fertility map covers the entire cultivated area of 8.8 million ha, and ensures that farmers use the right type of fertilizer to meet the needs of for their crops and soil type.[12]

The National Office for Sanitary Safety of Food Products (ONSSA) also developed a new national system for animal identification and traceability (SNIT), implemented in 2015 as part of the PMV. Livestock can be identified using electronic technology loops that communicate with the national SNIT database via mobile phone networks. The

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system serves as a tool to increase transparency and traceability while promoting Moroccan animal products on international markets such as the European Union. In addition, the identification tags have other benefits for breeders too, including evidence of ownership and theft prevention, facilitating access to government subsidies, and ensuring that meat meets quality and safety standards. After its official launch, a widespread campaign identified

approximately 2.9 million cattle to be tagged, equivalent to 99 percent of the national cattle herd.[13]

In addition, to improve the efficiency of the agriculture value chain, the Moroccan government, through the Ministry of Agriculture, set up an information system (ASAAR) in 2011 to provide farmers, traders and consumers with updated information on market prices, allowing them to make more informed decisions on commodity prices, and when to buy or to sell their produce. In addition, the system enables coordination and integration of farmers into the value chain, allowing them to add value to their crops along the value chain. While the ASAAR primarily serves the various stakeholders in the agriculture value chain, it also provides the government with important information on market conditions, with the aim of improving decision-making in the areas of agricultural policy and food security.[14] Moreover, Morocco has deployed two satellites, which enable a range of applications, such as monitoring of agricultural activities, prevention and management of natural disasters, and monitoring of environmental trends and desertification.[15]

Furthermore, Morocco's enabling digital environment and access to the internet has allowed the private sector to take an active role in the digitalization of the agriculture sector. One example is the Moroccan platform for the sale or purchase of new or used agricultural equipment, AgriAffaires.ma, developed in 2017 by the start-up AgriSolutions SARL. The platform connects farmers and sellers of farming and livestock equipment, including secondhand machinery, and agricultural land. The platform allows for quick and easy online posting of announcements.[16]

The government of Morocco has committed to increasing the penetration of ICTs through institutional and programmatic innovations over the past years, which has contributed substantially to an increased digitalization uptake that benefits the whole economy, including the agriculture sector. In addition, the government has recognized the importance of a conducive business environment to sustainably increase ICT-based services relevant for strengthening food value chains. However, public-private partnerships need to be more actively facilitated and promoted for a sustainable agricultural digitalization.

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