

BYTE BY BYTE

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



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The Government of Senegal has shown clear commitment to promoting greater ICT penetration and provision of ICT services, including in the agriculture sector, through carefully designed policies and regulations. The country's EBA ICT scoreⁱ of 4.5 out of 9 indicates a strong enabling digital environment with regard to laws, regulations and policies, while its score of 37.3 in the GSMA Mobile Connectivity Index (MCI)ⁱⁱ reflects relatively good performance on the affordability of connections and handsets, as well as network coverage. This achievement is largely due to the government's commitment at institutional and programmatic levels to create an enabling environment for digitalizing its economy, including the agriculture sector.

Institutional innovation

Several institutions in Senegal are responsible for ICT development. The Ministry of Digital Economy and Telecommunications promotes the penetration of ICTs and their application in all sectors of the economy through the Directorate of Information and Communication Technologies (DTIC). DTIC implements the government's policy related to digitalization, which includes research and development of technologies and applications aimed at reducing the digital divide across the country and accelerating the competitiveness and growth of businesses.¹ In 2001, the Regulatory Authority for Telecommunications and Posts (ARTP) was created as an independent

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.



administrative authority with legal status and financial autonomy to regulate the telecommunications and postal sectors, including compliance with national competition law. Furthermore, in 2004 the *Agence de l'Informatique de l'État* (ADIE) was created to increase the use of ICTs within the Senegalese Administration. It provides citizens and businesses with a decentralized interface to access information on services provided by the government, thus reducing social exclusion. In addition, ADIE seeks to establish a reliable information system for effective monitoring of government programs. ADIE also coordinates the establishment of legislative and regulatory frameworks conducive to the development of ICTs in the public sector.

In 1997, Senegal put in place a legislative and regulatory framework to promote the use of ICTs while minimizing their risks, including cybercrime.² This facilitated the entry of new mobile network operators. Mobile broadband connections are also growing rapidly, as 3G and 4G coverage is expanding at almost 63 percent per year.³ Between 2000 and 2017, the share of population using the internet increased from less than one percent to 59.38 percent.⁴ In 2001, the government introduced the universal service law in the telecommunication code to finance and subsidize selected ICT services for the most marginalized and poor segments of the population, in order to ensure that they benefit equally from access to the internet and new digital technologies. As a result, Senegal complies with the 2007 ECOWAS Additional Act, which stipulates access to a minimum set of services at affordable rates throughout the region. These include telecommunications services, such as access to telephone directories and public pay phones.⁵ Furthermore, in 2008, Senegal created the Commission for the Protection of Personal Data, which is an Independent Administrative Authority. It ensures that the processing of personal data is carried out in accordance with legal provisions and informs without delay the public prosecutor of the offenses of which it is aware.⁶

Policy and programmatic innovation

While investment in ICT infrastructure was low prior to 1977, the Fifth Economic and Social Development Plan in 1978 launched a new phase of ICT infrastructure development, lasting until 1990. A vigorous boost in public investment, with a focus on ICT development, meant that in just one year, the investment in telecommunications as a share of total public investment increased from 2.5 percent to 5.7 percent. However, starting in the 1990s, public investment in ICT sector decreased significantly due to the severe economic crisis affecting the country. Over just one year from 1989 to 1990, investment fell from US\$22.6 million to US\$8.9 million—an amount comparable to that of 1978. The decline continued further until 1995, when public sector investment in ICTs infrastructure fell to 1.4 percent of total investment.

However, since 1997, with the adoption of a more liberalized approach, new opportunities have emerged for the private sector to invest in the ICT sector infrastructure.⁷

In addition to investment in infrastructure development, programs facilitating access to ICTs began to be implemented across the country. Since the late 1990s, the Multimedia Community Centers (CMCs) project—initiated by UNESCO, the Swiss Agency for Development and Cooperation (SDC) and the government of Senegal—has been driving efforts to reduce the digital divide. The project sought to connect rural and marginalized communities to the internet and ICTs such as community radios and computers. Twelve new radio frequencies, 13 radio stations and 20 cybercafes were opened through the project. The project has also trained more than 730 people in radio production, computer usage, the internet and multimedia, and administrative, technical and financial management of Multimedia Community Centers.⁸

In 2007, Senegal created the Universal Telecommunication Service Development Fund (FDSUT) to provide financial support to any public agency for the provision of ICT services. The FDSUT also finances the extension of telephone and internet services to rural and urban areas to improve their social and economic integration and ensures that the beneficiaries are involved in the development and provision of services to meet their specific needs. Furthermore, the FDSUT promotes entrepreneurship to make ICT services available in rural areas.⁹ Through the funding from FDSUT, innovative ICT solutions are now being developed for the agriculture sector, such as DARAL Technologies.

DARAL Technologies was created in 2014 by young entrepreneurs to support farmers dealing with livestock diseases and theft. The project uses traceable nose rings on livestock to monitor, track and communicate about herd movement through SMS alerts. The technology is also used by individuals or organizations that are looking to buy or sell livestock, allowing them to secure their transactions. By 2016, DARAL had been active in 10 villages in southern Senegal, equivalent to 2,553 farmers. There are plans in place to bring DARAL to scale in collaboration with the Ministry of Agriculture.¹⁰ The government's Digital Senegal 2025 strategy has guided the dissemination of digital technologies in all sectors of the economy since 2016. With respect to the agriculture sector, the strategy seeks to improve productivity through easier access to information on prices, soil quality, weather and new farming techniques via mobile and internet. To do so, the government is implementing a system to modernize agricultural activities by developing mobile telephone, GIS, and satellite imagery-based applications to allow forecasting throughout the production cycle, send shocks alerts, raise awareness on prevention measures and provide geolocation of livestock.¹¹



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To support the Government of Senegal's objectives of reducing poverty and food insecurity among its vulnerable rural populations, USAID launched the Feed the Future Senegal Naatal Mbay Project ("Flourishing Agriculture" in Wolof), funded under the US Global Food Security Act. The project aims to scale up and expand successful technologies, skills and approaches for inclusive growth and resilience in rice, maize and millet value chains. GPS-enabled devices were introduced to farmers to measure their fields accurately. With accurate measurements, they can purchase the correct amounts of seed and fertilizer. Farmers were also taught to track planting methods, timing, spacing, and rainfall. In addition, the program installed automated rain gauges in farming areas, allowing insurers to quickly and accurately determine farmers' losses and set crop insurance payments. Naatal Mbay's key contributions include: a 15 percent reduction in rice imports by Senegal in 2016, increased use of state-of-the-art farm equipment, such as tractors and harvesters, enabling more efficient harvests, and a threefold increase in crop yields among women growing upland rice in the formerly conflict-ridden Casamance region.¹²

With respect to the private sector, there is evidence that an enabling digitalization environment is leading to a more effective uptake of digital technologies and services

in the agriculture value chain. Since 2001, Manobi has been providing digital services through mobile phones to farmers, fishermen and agribusinesses to strengthen their position in national and international markets. For fishermen, services include geolocation, a safety program using GPS/GSM, and a weather and tidal information service for fishermen. Manobi also operates Xam Marsé—a platform that allows farmers to share knowledge and information and receive business support through crop monitoring services and market information on prices, as well as sell their produce. The database is fed by real-time information on prices for main crops and products according to variety, origin and packaging. After a successful phase of testing the system with horticulturists in Sébikotane, a rural community near Dakar, the company expanded the service to other regions across Senegal.¹³ Manobi is now active across West Africa, including in Mali, Côte d'Ivoire, Benin, Niger and Burkina Faso.¹⁴

In 2017, Bayseddo was launched—a digital platform to connect farmers and land owners to investors seeking to invest in farming. Large shares of arable land remain unfarmed across the continent due to a lack of sufficient capital, while at the same time, there is a growing number of investors interested in investing in the agriculture sector. Since its launch via Bio-Agripôles, Bayseddo has facilitated four



agricultural partnerships in the region of Saint-Louis, farming 18 ha of land. The company has generated US\$130,000 and created 20 jobs so far.¹⁵ In 2017, the Bayseddo won a prize of US\$15,300 from CTA to scale its operations.¹⁶

The Senegalese government has steadily increased the dissemination of ICTs through institutional and programmatic innovations over the past years. This has contributed to an increased uptake of digital services and tools for the benefit of the whole economy including the agriculture sector. The quality and extent of ICT infrastructure due to the

growth in national ICT expenditure since the 1980s and the subsequent liberalization, the availability of human resources and the entrepreneurial spirit of a growing number of young Senegalese have fostered the digitalization in the economy. Yet, despite these achievements and initiatives by the government and international organizations, more effective cooperation with the private sector is needed to be able to harness the opportunities of digital technologies for the agriculture sector.

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