



## **DIGITAL TECHNOLOGY - THE CASE OF ALBANIAN AGRICULTURE**

**Jona Mulliri, Ph.D.** 

Lecturer, Department of Mathematics and Informatics,  
Faculty of Economy & Agribusiness, AUT, Albania  
jmulliri@ubt.edu.al

**Brunilda Baraku, Ph.D.**

Lecturer, Department of Mathematics and Informatics,  
Faculty of Economy & Agribusiness, AUT, Albania

**Edmira Shahu, Ph.D.**

Lecturer, Department of Mathematics and Informatics,  
Faculty of Economy & Agribusiness, AUT, Albania

### **Abstract**

*The use of digital technologies in every sector has dramatically changed the approach of organizations in our country, their structure, marketing practices, operations, distribution channels, costs and benefits as well as the organization and nature of markets. It has influenced consumer behavior and decision-making just as strongly. This change has undoubtedly affected the agricultural economy sector, embraced mostly by the main VCh in the agribusiness system, as input providers, collectors, transformers, exporters as well as the largest agricultural commercial farms. This study aims to assess the level of use of information systems as well as digital services in the agricultural production sector in Albania, as well as the differences in ICT use between rural and urban areas. We asses that there are a number of structural barriers to Albanian livelihood that do not favor digitalization such as the small size of the farm, limited financial resources, low level of familiarity with technology but also the lack of digital infrastructure in rural areas. From the analysis, we*

*conclude that there is a digital divide which seems to be visible in rural areas. Key reasons for the persistent digital division are lack of infrastructure and lack of institutional capacities, but also affordability, for both fixed and mobile broadband access, especially in rural and low-income areas.*

*Keywords: Digital services, farm production, e-agriculture, rural development*

## INTRODUCTION

Information technology and digital services represent a "wind" that is substantially changing business activities, government activities, the way entities and resources are organized, and, of course, costs and day-to-day operations. ICT has also dramatically impacted consumer behavior.

This impact has become evident and imperative after the Covid19 period. But apparently such an impact is not so visible in the agricultural economy sector and especially in the deep rural areas of Albania where the digital divide seems to be evident.

Information and communication technologies (ICTs) in general and information systems in particular assist in business operations, increase market and price information, affect the effectiveness of the use of objective resources such as land, labor or capital with significant managerial effects, and benefit. Despite the extensive information provided through the Internet and social media in general, information networks and platforms, communication and interaction for the agricultural economy sector are still at an early stage of development in our country. In recent years the level of e-government services also some other digital platforms at the service of many businesses have grown exponentially, but this growth does not affect the rural sector and the agricultural economy to the same extent.

In terms of movement restrictions and limitations due to the Covid19 pandemic situation the assessment of obstructive and influencing factors and also the evaluation of possible ways for the development of the information system in the service of the agricultural sector remain of particular importance. This statement is even more evident considering the weight of agricultural activity in the country (20% of GDP, INSTAT 2020) and the high level of labor force engagement in agricultural activities (48%, MARD Reports, 2020).

The use of information systems in agriculture nowadays represents an opportunity as well as a significant development effect in agriculture in our country and for the improvement of quality of life in rural areas.

## LITERATURE REVIEW

Digital agriculture illustrates how to meet challenges so as to balance the economic, environmental and social dimensions of sustainable food production (B.Basso; J.Antle 2020). Digital services represent today a widely used instrument in sectors or businesses that have rapidly embraced innovation by giving them "additional weapons" and competitive advantages. Information technology along with the ability to use and adapt it is a key factor in generating and accessing wealth, power and knowledge nowadays (Peter Benjamin, 2000, "African experience with Telecentres").

Digital technologies overcome information problems that hinder market access for many small-scale farmers, increase knowledge through new ways of providing extension services, and they provide novel ways for improving agricultural supply chain management (U. Deichmann, A. Goyal, D. Mishra 2016)

Food security is a global challenge and agriculture can address this challenge through radical improvements in productivity, efficiency and effectiveness. Internet of Things (IoT) is a major enabler of such improvements. (Jayaraman P.P., et al. 2015).

E-agriculture involves designing, developing and applying innovative ways to use information and communication technologies (ICT-s) with a primary focus on agriculture (E-Agriculture; Strategy Guide, FAO 2017).

Several initiatives have been taken as part of the Inter-Sectoral Strategy of Rural and Agricultural Development 2014-2020 to develop an integrated management and control system (IMCS) with the main focus on public information on the land surface, farms and rural activities which are still in the initial stages.

In the general system theory, an information system is accepted as a system, automated or manual, that comprises people, machines, and/or methods organized to collect, process, transmit, and disseminate data which represent information (Kürşat Demiryürek, Information systems and communication networks for agriculture and rural people, 2010).

A considerable number of authors are focusing every day and more on digital services in the agricultural sector and the impact they have on the development of countries. Although we must say that there are quite a few differences in optics and role in rural areas.

## RESULTS AND DISCUSSION

The use of information technologies as everywhere in the region and in Albania has experienced an enormous increase. He has initially embraced businesses with an "aggression" approach to innovation as well as businesses that have embraced cost minimization strategies. But just as obviously digital services have been embraced by the government in recent years. In

this context, the amount of investments made in the development of databases, systems, their integration and the provision of digital government services has been high. The total contribution of the ICT sector to GDP for 2017 reached 3% (Eurostat statistics 2017), while in the EU, the value added of the ICT sector in 2016 was 3.75% of GDP.

There are two important preconditions in the development of information technologies, information systems and digital services in particular regarding:

- Existence of environment and demand generated by economic actors for ICT and information systems
- The level of direct initiative, the willingness and ability of the government to get involved in this area.

Considering the above definitions and taking into account the agricultural economy and stakeholders involved in rural activities, we conclude that the second precondition is "leader" and the first "follower".

This is related to a significant number of barriers mostly related to the low level of knowledge and use of ICT and information systems by farmers and other actors in agricultural activities.

Although the heavy physical infrastructure in our country in the last decade has developed significantly and almost uniformly in rural and urban areas such a thing cannot be said about the infrastructure related to digital services.

The level of a country in the digital and information economy by the UN / ASPA is categorized as an aggregate of several phases: emerging; enhanced, interactive; transactional; and fully integrated or seamless (Benchmarking E-government: A Global Perspective, 2012).

In this classification, our country is in the third phase (interactive), this has to do mostly with the digital services not necessarily related to the agricultural economy.

From a public standpoint, information systems aim to address some of the structural problems faced by Albanian agriculture that are mainly related to the problems of ownership, farm size and consolidation of agricultural land, low level of mechanization and technology, level of competitiveness as well as food security.

Some of the structural problems of rural development are intended to be addressed through the building and interconnection of integrated data systems and services such as e-Albania, which has significantly changed the structure of services but not necessarily that of agricultural activities.

Based on the e-Government survey 2018, it results that Albania ranks in the second escalation in terms of E-Government Development Index (EGDI), with a value of this index: High EGDI 2018 (Between 0.50 and 0.75).

Also considering The Online Services Index component of the E-Government Development, our country is ranked in the High OSI classification, (Countries grouping by Level of Online Service Index (OSI), 2018).

This Index is a composite indicator measuring the use of ICTs by governments in delivering public services at the national level. Meanwhile, based on INSTAT data (<http://www.instat.gov.al/>, 2021) results that the level of use of public services has increased significantly, especially in the last two years.

The Covid-19 pandemic may be one of the reasons for the almost enormous growth of digital services in addition to the government's offer of these services.

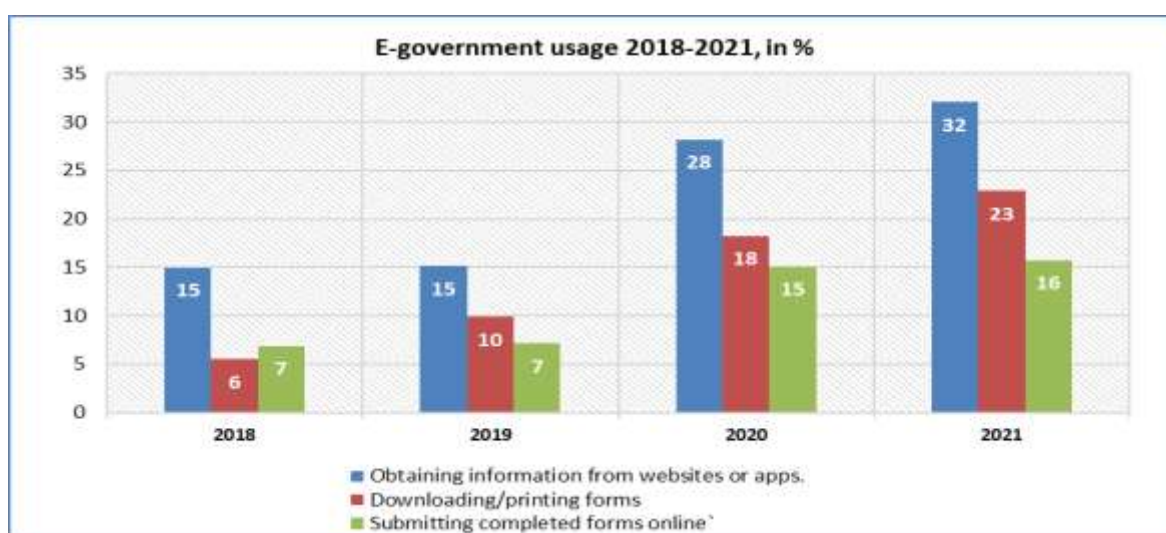


Figure 1. E-Government usage 2018-2021

As shown in the figure above, although there is an increase in the use of ICT in the last two years according to National Plan for Sustainable Development of Digital Infrastructure, Broadband 2020-2025, GoA; “A significant rural-urban digital gap persists, mainly due to the lack of adequate infrastructure to provide meaningful connectivity” and thus the solutions and their effects on the rural economy in the country remain marginalized.

ITU identified the lack of rural connectivity as “one of the major gaps” that hampers growth in the country (ITU (2016), ICT Centric Innovation Ecosystem Country Review Albania)

But we have to conclude that in parallel with the increased information intensity provided to farmers, the business financing costs have often been high due to the loan rates granted by microfinance companies. Therefore, even in this aspect, the effects have been limited.

Based on the practices used by the Agriculture and Rural Development Agency in 2020 in measures of direct support of agriculture from national schemes and also those of IPARD

through e-Albania, we can conclude that it is an important step as a good example to follow and its impact on "extension" in the medium and long term.

## CONCLUSIONS

Regarding the distribution of fixed broadband connections in 2019, almost 90% of the total fixed connections are in urban areas and 10% in rural areas. The Digital Divide in urban and rural areas remains high (AKEP data for 2019, and INSTAT for regional population figures January 2019).

Significant impacts in the agriculture sector can be expected from enhanced broadband development, by enabling organizational change and enhancing coordination to reap productivity gains from overall investments in ICTs.

Key reasons for the persistent Digital Divide are lack of infrastructure and lack of institutional capacities, but also affordability, for both fixed and mobile broadband access, especially in rural and low-income areas.

In recent years there is a noticeable trend in the construction and functionalization of digital platforms in the field of agriculture. Some of them are in operation today, mostly created as a product of donor support projects such as JICA, GIZ, etc. but there is limited statistical data on the level of their use.

Unofficial figures show that their activity is limited mostly to the central part of the country.

Referring to the level of using information systems in rural areas and the structural problems faced by economic stakeholders, the role of ICT in economic activity in these areas remains weak.

There are high expectations regarding the mid-term development of information systems but also the expected effects on the agricultural economy sector, both in terms of digital services by the public sector and by private initiatives in this field, but these remain to be verified in continuity in the stakeholders' activity and the agricultural economy sector.

Finally, we consider that the evaluation of the main variables of digitalization as well as the effect they have on agricultural production would be the focus of another study in the future.

## REFERENCES

- AKEP data for 2019, and INSTAT for regional population figures, January 2019.
- Basso, B., Antle, J. Digital agriculture to design sustainable agricultural systems. *Nat Sustain* 3, 254–256 (2020).
- Benchmarking E-government: A Global Perspective, 2012.
- e-Agriculture; Strategy Guide, FAO 2017.

Eurostat, [https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT\\_sector](https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_sector).

INSTAT statistics, 2021.

Inter-Sectoral Strategy of Rural and Agricultural Development 2014-2020, MARD.

ITU, ICT Centric Innovation Ecosystem Country Review Albania, 2016.

Jayaraman P.P., Palmer D., Zaslavsky A., Salehi A., Georgakopoulos D. (2015) Addressing Information Processing Needs of Digital Agriculture with Open IoT Platform.

K. Laudon & J. Laudon, Management Information Systems: Managing the Digital Firm, 2019

Kürşat Demiryürek, Information systems and communication networks for agriculture and rural people, 2010.

National Plan for Sustainable Development of Digital Infrastructure, Broadband 2020-2025, Approved by DCM no 434/20, GoA, 2020.

Peter Benjamin, "African experience with Telecentres" 2000.

United Nations, E-Government Survey, 2018: Countries grouping by Level of Online Service Index (OSI), 2018

Will digital technologies transform agriculture in developing countries? (U. Deichmann, A. Goyal, D. Mishra, Agricultural Economics Volume 47, 2016)

World Bank Report, 2018.