

PRODUCTIVE FORCES DEVELOPMENT AND REGIONAL ECONOMY

Jona Mulliri,

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;

Brunilda Baraku,

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

INFORMATION SYSTEMS IN ALBANIAN AGRICULTURE; PROBLEMS AND FUTURE CHALLENGES

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Abstract: *Information and communication technologies (ICT) in general and information systems in particular help the decision-making process, increase market and price information, impact the effectiveness of using objective resources such as land, workforce, or capital with evident managerial and profitability effects.*

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.

Our country represents one of the countries where the use of ICT has significantly increased in recent years, although the economic infrastructure and level of knowledge mastered by individuals and businesses (especially in agriculture and rural areas), has been inadequate.

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.

Based on the level of information systems usage in rural areas and the structural problems that economic stakeholders and entities face in the Albanian terrain, the role of ICT in the economic activity in these areas remains weak and with invisible effects.

Keywords: *information systems, agriculture, e-agriculture, ICT*

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Introduction

In the last decade, the development of ICT has made a revolution in the business activity in our country. It has significantly affected the increase of volume, speed, accuracy and cost of information, reducing costs and increasing the efficiency of resources as well as the business activity in general. For some reasons which will try to explore in this paper, such an impact does not seem to be so obvious in the agricultural economy sector. Information and communication technologies (ICT) in general and information systems in particular help the decision-making process,

increase market and price information, impact the effectiveness of using objective resources such as land, workforce, or capital with evident managerial and profitability effects. 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 the 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).

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Literature review

Information and communication technology (ICT) represents 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").

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).

Information systems are typically computer systems used to manage five primary components: hardware, software, data (information for decision making), procedures (design, development and documentation), and people (individuals, groups, or organizations) for collecting, storing, and processing data and for providing information and knowledge (K. Laudon & J. Laudon, MIS, 2019).

It should be noted that there are still few studies related to information systems in agriculture and interaction platforms, mainly in the rural activities.

An information system in agriculture represents "... a system, in which agricultural information is generated, transformed, consolidated, received and fed back ... to underpin knowledge utilization by agricultural producers" (Röling N.G. (1988): Extension Science: Information System in Agricultural Development. Cambridge University Press, Cambridge).

Results and discussion

Our country represents one of the countries where the use of ICT has significantly increased in recent years, although the economic infrastructure and level of knowledge mastered by individuals and businesses (especially in agriculture and rural areas), has been inadequate.

ICTs and electronic communications play a central role in Albania. Total 2017 ICT sector contribution to GDP amounted to 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 related to:

- The existence of the environment and the demand generated by economic actors for ICT and information systems
- The level of direct initiatives, readiness and ability of the government to get involved in this domain.
- Considering the agricultural economy and the stakeholders involved in rural activities, we conclude that the second precondition is "leader" and the first "follower".
- This is related to a considerable number of barriers that have to do mostly with the low level of knowledge and use of ICT and information systems by farmers and other actors in agricultural activities. Considering the second precondition quoted above, some of the key management challenges for building and using information systems are:
 - Designing systems that are competitive, effective, and technologically consistent with developments.
 - Defining system requirements and the ability to provide information
 - Generating value-added information systems with clear economic and operational effects on users.
 - Designing systems that can be managed, controlled, functionally understood and properly used by the users.

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.

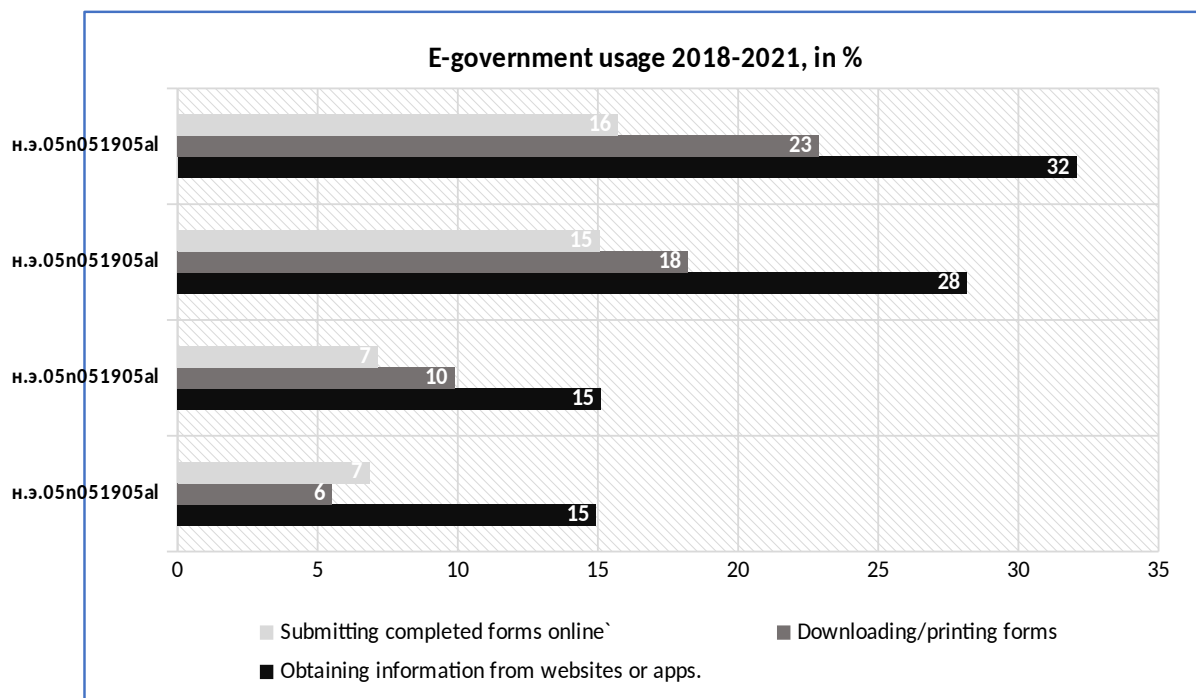


Figure 1. E-Government usage 2018-2021

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)

Based on the World Bank definitions, meeting the goals of agricultural development and addressing the challenges related to information systems will have to provide specific effects on the development of the agricultural economy (Table 1).

Table 1. Agriculture economy development by IS

No.	Agr. Goals and challenges	e-Agr. outcomes	e-Agr. solutions	Impacts
1.	Higher incomes for farmers	Better access to information	1. Market information	10. Higher prices, produce in a greater demand 11. Higher yield production 12. Accurate of soil health assessment 13. More efficient distribution chains 14. Increased efficiency and predictability 15. Higher yield, fewer losses.
2.	Lower transaction and distribution costs	Better access to extension services	2. Climate and disease information 3. Good agr. practices 4. Extension services	
3.	Improved traceability and quality standards for buyers	Better market links and distribution networks	5. Direct links between farmers, buyers and suppliers	
4.	New opportunities for financial institutions	Better access to finance	6. Better recording, accounting and traceability 7. Credit 8. Insurance 9. Payment methods	

Source: World Bank, 2018 (adapted)

Regarding the purpose suggested in point 3, we can conclude that there are still dysfunctional structures of following and meeting the standards in Albania due to the weak activity of the charged standards structures as well as the lack of implementation of traceability systems (one piloted for livestock, matriculation function failed). Thus the expectations and effects in this regard are minor and sporadic. In most cases, they refer to quality systems implemented by private actors in the agribusiness system, much less to agricultural and livestock farms. Referring to point 4, we find that there is a dissemination of information that is largely dedicated to the "aggressive" practices of financial institutions to diversify the portfolio (especially some banks of the second level) and mostly microfinance institutions. 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.

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