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INFORMATION AND COMMUNICATION TECHNOLOGIES AND RURAL DEVELOPMENT OF SERBIA

Abstract

The use of the information and communication technologies (ICTs) transforms ways of manufacturing, doing business, working, accessing public services, informing and communicating. They enable overcoming of both geographical distances and underdevelopment of infrastructures in rural regions and less developed ones. That is why ICTs can play an important role in encouraging economic development of rural areas, improvement of life quality of their population as well as lessening of social exclusion.

The paper is focused upon the possibilities of invigorating rural development in Serbia on the basis of the ICTs use, primarily the Internet. The paper firstly points to the main features of the Serbian village development; then it analyses the Internet access in rural areas. Finally, it points to the ways in which the ICTs can be used for stimulating economic development of the Serbian village in addition to improving life quality of the rural population.

Key words: *Rural Development, Information and Communication Technologies, Serbia*

JEL classification: *O18, O33*

ИНФОРМАЦИОНО-КОМУНИКАЦИОНЕ ТЕХНОЛОГИЈЕ И РУРАЛНИ РАЗВОЈ У СРБИЈИ

Апстракт

Употреба информационо-комуникационих технологија (ИКТ) трансформише начин производње, пословања, рада, приступа јавним услугама, информисања и комуникације. Оне омогућавају превазилажење географске удаљености и неразвијености инфраструктуре у руралним областима и мање развијеним подручјима. Због тога ИКТ могу да имају значајну улогу у подстицању економског развоја у руралним областима, побољшању квалитета живота становништва и смањењу друштвене искључености.

Предмет рада су могућности подстицања руралног развоја у Србији на основу коришћења ИКТ, пре свега интернета. У раду се најпре указује на главне карактеристике развоја српског села; затим се анализира приступ интернету у руралним подручјима. На крају, указује се на начине на које се

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ИКТ могу користити за подстицање економског развоја српског села, као и побољшање квалитета живота сеоског становништва.

Кључне речи: *рурални развој, информационо-комуникационе технологије, Србија.i*

Introduction

The use of the information and communication technologies (ICTs) transforms ways of manufacturing, doing business, working, accessing public services, informing and communicating. One of the characteristics of these technologies is that they cross over territorial borders. Hence they enable overcoming of both geographical distances and underdevelopment of infrastructures in rural regions and less developed ones. The Internet facilitates the foundation of networks as "crossover structures" that enables its partakers to "implement associations and synergize their activities on common priorities" (Tumbas, Matkovic, Sakal, 2013, p. 19). That is why ICTs can play an important role in encouraging economic development of rural areas, improvement of life quality of their population as well as lessening of social exclusion.

Rural development refers to the development of rural farm economy as well as that of rural non-farm economy, building of infrastructure, improvement of life quality, preservation of rural cultural heritage and living environment protection. For Serbia the stimulation of rural development is important not only because of the 2011 Population Census indicating that 40,56% of the population is living in the rural areas (Mitrović, 2015, p. 57) but also because of economic, demographic and social problems that the Serbian village is facing today.

The paper is focused upon the possibilities of invigorating rural development in Serbia on the basis of the ICTs use, primarily the Internet. The paper firstly points to the basic demographic, economic and social characteristics of the Serbian village; then it analyses the Internet access in the rural areas. Finally, it points to the ways in which the ICTs can be used for stimulating economic development of the Serbian village in addition to improving life quality of the rural population. The paper is based on the analysis of statistical data and strategic documents, as well as sociological and economic research on rural issues. When it comes to statistical data, it should be borne in mind that the Statistical Office of the Republic of Serbia uses the division of the settlements into "urban" and "others" based on the administrative criteria. The data about "other" settlements automatically apply to the rural ones.

Economic and Social Conditions in the Rural Areas

In order to understand social and economic situation in the Serbian rural areas it is necessary to briefly point to the historical development in the last two centuries (path dependence). Serbia has, as an independent state and as a part of Yugoslavia, undergone belated modernization. In the first half of the 20th century it was an underdeveloped

and predominantly agrarian country with poorly developed industry. After the World War Two, in the period of socialism development, for ideological reasons the rural development was neglected for a long period of time. "Rural areas were always viewed as a problem, rarely as a resource" (Bogdanov, 2007, p. 67). A troubled postsocialist transformation of Serbia coupled with economic crises and the lack of an adequate policy of rural development have all led to further devastation of the village. The most important consequences of such development are: depopulation and senilization of the village, small farm holdings and deterioration of farmers' cooperatives.

The migration process that was intensive during the country's socialist industrialization continued in the transition period as well. Along with a low population growth it led to depopulation of some (especially rural) parts of the country while the rural settlements either died away or were left with only households of the aged. The data obtained by the 2011 Population Census show that the average age of the rural population is 43,6 years while each fifth inhabitant is older than 65 years of age (Penev, 2015, p. 162). Each fifth rural household (20,5%) is elderly, namely, all the household members are older than 65 years of age; similar is the share of single households (21,5%) (Djurdjev et al., 2015, p. 272, 279). In Serbia there are 1034 settlements with less than a hundred dwellers. „In such devitalized villages and areas small is the number of perspective individuals and families; neither roads nor schools are built but what is already built is neglected and what is open is getting closed" (Mitrović, 2015, p. 48). Economic consequences of such a state are multiple – every year uncultivated remains the land estimated to range from 200 to 350,000 ha of arable land and meadows while the area of the unused farm land with pastures is considerably larger (Government of the Republic of Serbia, 2014, p. 14). This is the land whose owners are elderly and thus cannot work on it; or they have moved away or this is derelict land in social ownership. The number of derelict rural farm holdings is increasing. Despite low prices of the land and farm holdings, few are those interested in buying them and returning to the village even in the lowland areas.

Another consequence of such historical developments is a sheer size of the rural holding. A small rural farm holding was sustained throughout 19th century in Serbia thanks to the legal protection followed by, in the 20th century, agrarian reforms that led to fragmentation of great estates and allotment of their parts to poor families. In the socialist days of Yugoslavia no single collectivization in the village took part to some notable extent but legally the size of the private estate was limited to 10 - 15ha. That is why the dominant is a small rural holding that itself constrains modernization of production and competitiveness of farm holdings: 77,7% of the holdings are of up to 5ha in size; average size of the holdings possessed by physical persons is 4,5ha while the holdings usually comprise six portions (Government of the Republic of Serbia, 2014, p. 16). Today's village lacks many prerequisites for developing agriculture, namely, legally and technically defined land, educated workforce, larger cattle fund, cheaper capital, lasting interest or motivation of young people to get into farming and remain to live in the village (Mitrović, 2015, p. 209). Moreover, underdeveloped rural non-farm economy and public sector in the rural areas contribute to the economic underdevelopment of these regions.

Farm cooperatives have a long tradition in the Serbian village. In the socialist period they were forms of association and cooperation of independent agricultural producers. Despite the weaknesses of such a form of organization, they played an important role in

marketing of farm products, input acquisition, building of infrastructure and social life of the rural population. In the transition period a considerable sum of these cooperatives ceased to exist while a few new ones were created. The cooperatives are facing a series of problems which unable them to meet the objectives they were created for (Cvejić, 2016). No land was returned to them by restitution. The ownership of the cooperatives over the land has not been legally regulated which lessens their chances of obtaining bank loans for production or of competing for various projects. The lack of experts and professional management coupled with a low level of social capital has both limited the cooperatives' efforts to adjust themselves to the new ways of doing business. „The dying out of cooperatives economically and socially weakens local rural communities while poor economic resources and a low social capital create further unfavorable prerequisites for future individual and joint activity" (Cvejić, 2016, p. 187). The institutional framework and financial support to cooperatives are not stimulating for their development.

The development as presented above affects life quality and social exclusion of rural population. Poverty, underdeveloped infrastructure, a difficult access to health care and education, lack of cultural and entertaining programs – all this has an impact upon the decision to leave the village (or to direct children to leave the village) or to make the village unattractive for urban people to return to it (such as workers who remained unemployed while having a farm in the countryside or pensioners or unemployed who would, with adequate training and state support, start farm or rural non-farm economy and services in the village and the like).

Considering the policy of rural development what must be taken into account are peculiarities of a given region as well as the difference among three kinds of rural regions in Serbia, namely, hilly-mountainous, big cities environments and lowland or flatland ones. Of them all, the most unfavourable position is taken by hilly-mountainous villages, distant and with poor communication links with big cities, with small family holdings and semi-natural economy. Mitrović (2015) distinguishes five types of villages with respect to their sustainability, namely, deserted (less than ten dwellers), disappearing (less than 100 dwellers or less than 200 dwellers if there are no children or women of childbearing age), sustainable (in the socio-economic and demographic sense, these are medium-developed villages with more than 500 dwellers), prosperous (above-average developed villages in terms of development of agrarian and rural structure and infrastructure) and prominent villages (that can serve as a good example to others in some important aspects of rural life) (pp. 221–222). In this paper a special attention is devoted to the possibilities of stimulating development of the villages whose sustainability is jeopardized.

Use of the Internet in Rural Areas

The prerequisite for making use of the possibilities created by the information development in rural areas is accessibility and the use of the Internet by rural population. The data obtained in 2020 show that a digital divide between the village and the city in Serbia is prominent (Table 1). Somewhat less than two-thirds of the village households possess a computer and 90.3% possess mobile phones, while a connection to the broadband Internet is possessed by 70.1% households. Only 3.2% have internet access elsewhere (Statistical Office of the Republic of Serbia, 2020, p. 31).

Table 1: Percentage of households having a computer, a mobile phone, an internet connection and a broadband internet connection by type of settlement

Type of settlement	Computer	Mobile phone	Internet connection	Broadband internet
Urban	81.6	96.3	87.1	87,0
Rural	61.8	90.3	70.4	70.1

Source: Statistical Office of the Republic of Serbia 2020, p. 30, 15

The reasons that the rural population states when asked about the lack of the Internet connections point to the actions that have to be undertaken, namely: don't need the Internet (75.6% of rural not-have population), equipment costs too high (20.4%), access costs too high (10.9%), lack of skills (9.4%), broadband internet is not available (7.6%). The research conducted in 176 rural settlements in four municipalities in Southeast Serbia which belong to the devastated regions (with development level below 50% of the Republic average) shows that 29% of villages have an access to the broadband Internet and 44% of them have a mobile phone signal (Jelić, Kolarević 2021, p. 1344).

When it comes to computer literacy, according to the 2011 Census, one third of rural population is computer-literate or possesses, to an extent, computer skills (Table 2). Two-thirds of the population is computer-illiterate, that is, people who do not know how to perform any of the questioned activities.

Table 2: Population aged 15 and over by computer literacy and type of settlement (%)*

Type of settlement	Computer literate persons	Persons with partial computer skills	Computer illiterate persons	Total
Urban	44.09	15.11	40.80	100
Other	19.84	14.29	65.87	100
of which:				
Male	20.93	15.58	63.49	100
Female	18.74	13.02	68.24	100

* Data relative to whether a person knows text processing, creating tables, sending and receiving electronic mail, as well as whether a person knows how to use the Internet.

Source: Statistical Office of the Republic of Serbia, 2013, p.140

Education is the most important predictor of an efficient use of the Internet. Educational structure of the rural population in Serbia is unfavorable though it has been considerably improving in the last decades. According to the 2011 Census, half of the rural population is of primary and less than primary education (51,1%) while only 6,1% is with high and higher education (Statistical Office of the Republic of Serbia, 2013, pp. 34–35).

The data about Internet connections, computer literacy and educational structure of the rural population must be taken into account when it comes to considering the possibilities of stimulating rural development and social inclusion of the rural population through the ICTs. In order to benefit from these possibilities it is necessary to encourage the rural population to use the Internet as well as enable it to develop adequate skills. In addition, to motivate the Internet usage in the rural areas it is necessary to make the rural

population familiar with the concrete benefits they would have from using the Internet for farming and non-farming businesses as well as for fulfillment of all sorts of its needs; also, the rural population should be trained for mastering the basic Internet skills as well as those needed for business through the Internet in addition to opening up telespots in local communities (schools, cultural centers) for connection and training. It is of special importance to make people familiar with the opportunities of the Internet connection through mobile phones that are more accessible to the rural population and that enable realization of different activities through various applications.

The Digital Skills Development Strategy of the Republic of Serbia (2020) highlights the population of rural areas as one of the groups exposed to the digital divide and envisages measures to reduce this gap (pp. 43–44). Having in mind the specifics of rural areas, raising awareness about the use of ICTs can be achieved through conducting campaigns, TV and radio shows and the Internet. Non-formal education should be adapted to the rural conditions (use of public spaces, libraries and schools; NGOs' activities, "traveling" trainings, massive open online trainings (MOOCs), promotion of peer to peer education). Given that a large number of people are switching to mobile phones without previous computer experience, the Strategy stresses that mobile literacy is needed to overcome the gap between basic phone use and smartphones use (Government of the Republic of Serbia, 2020, p. 39).

ICTs and Rural Development

The role of the ICTs in stimulating the development of rural areas can be fully comprehended if we observe, on the one hand, the needs of the given areas and, on the other hand, the possibilities to contribute, by means of the ICTs, to their long term and sustainable fulfillment.

Data from the 2012 Census of agriculture show a low level of education in the field of agriculture. Most farm managers have acquired knowledge of agriculture exclusively through practical experience (60%). When it comes to formal education, 2.5% have completed high school in agriculture, and 1.4% have graduated from the faculty of agriculture. Only 3.2% of farm managers attended some form of education and training in the census year (Bogdanov, Babović 2014: 44–45).

The exploration of small rural households has shown that two-thirds of the examinees stress the need for jobs outside farming as a factor that would contribute to a better life of their households (Bogdanov, 2007, p. 152). This is followed by credit availability (57,4%) while the third factor refers to the ensured market for their products (40,3%). A smaller number of examinees state, as the most important factors; access to information (16,8%), business associations (12,9%) and training and education (12,5%).

The sustainable development of the rural areas should be oriented to two directions, namely, economic development (development of agriculture and rural non-farm economy) and improving life quality of the rural population and community. When it comes to the economic development, the Internet can contribute to informing, marketing and sale of products, development of non-farm businesses and associations of farmers and service providers.

Informing represents a very important problem for rural holdings in view of their geographical position and educational structure of population. The above mentioned

research project (Bogdanov, 2007, p. 142) has shown that, for instance, the state counseling service agency for agriculture as a source of information is mentioned by only 2,1% of the rural households; more than 40% of households are not aware that the counseling services exist, and further 24% has a need for such services but does not know how to acquire them. This example shows that farm producers do not know what sources of information exist which are of relevance for their business; and even if they know of their existence, they are ignorant of how to contact them. The Internet provides the possibilities for them to find out, in a simple way, what sources of information exist, and to get the needed information just on time and from many different sources (from expert agencies to other farmers). The Internet ensures a personalized and two-way communication while the range of information refers to practically all the fields of interest to farm holdings: social networks, mailing lists and other applications ensure regular information about any topic the user cares to choose. For the Internet function to be performed efficiently, it is necessary for the organizations and organs dealing with affairs of interest to the rural holdings (state organs, banks, insurance agencies, non-government organizations, expert and scientific organizations) to adjust their activities to the needs and capabilities of farmers. In all this care should be taken of the changes taking place in economy and a rural way of life – all sorts of information about bank loans, insurance, subventions, taxes, agriculture-designed projects, cadastre, market developments, product standards and ways of acquiring certificates are equally needed to the farmers just as much as they need information about production innovations. The Internet widens up a circle of experience exchange among the farm producers themselves: social networks, forums, blogs and commentaries on the part of the users provide for information exchanges regardless of their places of residence which becomes very important when it comes to narrowly-specialized topics. The platforms for such information exchanges can be given by the Cooperative Association of Serbia, associations of agricultural producers, state agencies, local self-governments, non-government organizations and media organizations. A successful example of the Web site with information collected from different fields and the forum for communication is provided by the Agricultural counseling and expert services of Serbia.

Secondly, the Internet offers various possibilities for marketing farm products. Most of the farm holdings have, for one thing, small and unspecialized economy which is insufficient for supplying great trade chains with while, moreover, they are often too far from urban settlements and without sufficient workforce to sell their products directly at local markets. The Internet provides informed decision-making on the basis of an insight into market developments, product advertizing, a direct contact with the buyer and sale *via* the Internet, avoidance of mediators and shortening of supply chains as well as finding market niches for specific products. The process of carrying out financial transactions and applying for projects and state subventions is made easier by using e-management services through the Internet thus reducing the costs of their businesses.

Thirdly, the Internet can contribute to the promotion of rural non-farm activities. Rural development does not imply only the development of farm economy but also of rural non-farm economy thus diversifying economy and ensuring population employment. Regarding the economic situation in Serbia as well as the lack of infrastructure and educated workforce in the countryside, no considerable investment into rural areas is to be expected. That is why attention should be paid to production and services based on

knowledge and resources of rural holdings. The ICTs can contribute to such development, firstly by recognizing the possibilities of rural non-farm economy. Namely, many skills that the village dwellers possess are not learnt at school but they are mastered through the process of growing up and working on rural holdings (Bogdanov, 2007, p. 115). That is why they are often experienced as something taken for granted and with no market value. That is exactly what the Internet is offering, namely, the opportunity to the village people to recognize what sorts of things can be a source of profit while, at the same time, being the sort of things they themselves possess enough skills, prerequisites, means and tradition to produce (old crafts, folk art, artifact of natural materials, food preparation in the traditional ways, rural tourism, recreational and educational tourism). In addition, the Internet provides for marketing and product sales, additional education, knowledge about how to make a brand of certain region by relying on cultural and rural legacy and natural riches (such as, for instance, pullovers from Zlatibor or carpets from Pirot). The carriers of the development policy can promote, through the Internet, a variety of ideas and point to the instances of successful practice besides offering helpful counselling (especially when it comes to financial and organizational aspects). Moreover, local communities can promote the advantages of their rural areas through the Internet for the sake of attracting investors. ICTs are very widely used in the tourism and travel business. Application in rural tourism is important because it enables overcoming the distance between supply and demand, improves intermediary business, increases the visibility of destinations and enables the competitiveness of rural supply (Vuković, Popović & Arsić 2016). The development of rural tourism does not only bring employment and income. Improving services, entertainment and cultural facilities aimed at attracting tourists at the same time contribute to better meeting the needs of residents, especially young people. „In such circumstances, young people can find not only economic, but also social and cultural reasons to continue living in rural areas“ (Maksimović, Urošević & Mihajlović, 2015, p. 91).

Fourthly, the ICTs plays an important role in strengthening social capital and setting up associations of producers (farmers, tourists, manufacturers). Small rural holdings cannot ensure quantity and continuity as providers; this, in turn, creates the need for their association and common market strategy. Two forms of organization are available: associations and cooperatives. There are successful examples of association that use the advantages of the Internet, first of all, in the field of rural tourism: Web sites of association collect, at one place, offers from different parts of Serbia, offer the possibilities to set up contacts with potential guests while, at the same time, educating their own members (for instances, how to present one's own offer in the most efficient way). Associations of producers of particular farm products (for instance, producers of raspberries) provide, through Web sites and social networks, exchange of information related to the innovation in production, situation at the market and problems faced by the producers. Unlike associations, cooperatives, to a lesser degree, use the Internet opportunities for doing business, networking and common activities. The Internet offers another possibility of linking that would strengthen social capital of village communities – "homeland networks" (Mitrović, 2015, p. 224). The homeland networks that would virtually link village dwellers, their co-villagers that have migrated abroad or to the city and their offspring, would activate hidden human potential for development by bringing together "those who know what and how with those who want and can – here and now" (Mitrović, 2015, p. 223).

The research of a Facebook group of small-scale food producers shows that this way of doing business is multifunctional, providing a number of opportunities to producers (Šljukić, Šljukić, Vidicki 2021). Participants are various: small-scale food producers (individual producers, family agricultural holdings, small partner cooperatives, organizations with food production as an additional activity, both from rural and urban areas), customers, agents between customers and producers, lawyers, translators, agricultural or food engineers and administrators. Diverse membership of the group provides producers with customers' suggestions concerning what it is they should produce and how as well as "legal services required for complex paperwork; expertise and advise relative to different production processes; business and marketing advisory services; translation services for product labels; transportation services in regular or refrigerated vehicles; agent services in the market expansion process (even in the foreign market penetration) etc." (Šljukić, Šljukić, Vidicki 2021, p.1332).

Besides invigorating economic activities in the village, of equal importance is the role of the ICTs in improving life quality of rural population and lessening of social exclusion. The most important problems that the rural population is facing are: underdeveloped infrastructure, availability of public services, a low quality of medical and educational institutions and the lack of organized cultural, recreational and entertaining programs. The ICTs application in diverse fields enables all sorts of activities to be done online and services and resources to be closer to the users (e-health care, e-management, e-banking, e-learning). The traditional ways of social life are dying away; mainly sports, cultural and art societies exist in the villages; other possibilities for social life that are more adjusted to the sensibility of younger generations are scarce. The networking *via* the Internet of cousins, friends, people of similar interests, social networks, membership in virtual groups, online learning and the like would provide for reducing the sense of isolation and the lack of perspective of rural population.

Besides economic sustainability and improvement of life quality, an important role implied in the ICTs application is an increasing consciousness about the significance of the protection of environment, biodiversity and cultural legacy.

The Information Society and Information Security Development Strategy of the Republic of Serbia (2021) envisages primarily activities aimed at development of all types of analytical information systems to support agriculture and tourism (agricultural statistics, public reporting and forecasting service systems, market information, registers, digitalization of subsidies award, etc.). A precondition for the application of ICTs in rural areas is the development of communication infrastructure, in which the state must play an important role, because it may not be profitable for operators in certain areas. The Strategy pointed out the development of modern telecommunication solutions, which enable the connection of remote rural areas as well as remote production plants (factories, agricultural farms, etc.) and thus enable the development of industry and agriculture (Government of the Republic of Serbia 2021, p. 67).

Conclusion

In order to make the most of the possibilities offered by the ICTs for the sake of stimulating rural development in Serbia it is necessary, for one thing, to encourage

the Internet usage by the rural population and, moreover, to develop contents and applications adjusted to the needs of the same population. A systematic and organized approach must involve state agencies, business associations, the Cooperative Association of Serbia, non-government organizations, specialized agencies for rural development and other actors that are to provide for online informing and business activities by using a variety of possibilities offered by the ICTs (Web sites, mailing lists, social networks, blogs, forums, Smartphone apps). In so doing, it is necessary that the contents should be customized to fit the needs of rural holdings while the applications should be accessible to rural population.

In the process of realization of the above-listed actions, it is necessary to rationally estimate possible effects of the applied actions having in view the peculiarities of economic and social conditions in different rural areas. The disappearing villages that are difficult to economically revitalize (less than a hundred dwellers, mostly older people) can be networked by creating „virtual rural municipalities" (Mitrović, 2015, p. 220) with the objective, primarily, to support the remaining rural population, improve life quality and safeguard natural riches and cultural legacy. When it comes to social-demographic and economically sustainable villages, attention should be directed to the stimulation of farm and non-farm economy, access to public services and social and cultural life thus making the village attractive as a place of living for (young) population.

Two more benefits should be mentioned. Firstly, digitalization of the rural amenities would not only stimulate the development of certain economic activities such as recreational tourism and creative economy (Rikalović, Molnar & Nikić, 2016) but would also lead to a change of the ideas about village life in both rural and urban population; this would, in its turn, launch a demographic renewal of the village. Secondly, village marginalization would decrease if the "voice" of rural population is heard more than it is now – meaning, its authentic statements of interest, needs, problems and experiences through the Internet would increase solidarity with rural population and impose the "obligation" on the whole society (first of all, policy creators) to do its best for the village to take the place it deserves in the Serbian society.

An integral social development of the rural areas implies a systematic long-term approach, coordinated actions on the part of various actors on the national and local levels as well as application of good practices (primarily those developed in the European Union countries) adjusted to the local conditions, the use of available (natural, human and cultural) resources and combination of traditional ways of economy with those of modern technologies and modern business. The ICTs application cannot replace a strategic approach and budget support but it can contribute to income diversification, faster and cheaper ways of doing business and greater competitiveness of rural households.

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