

# ТЕОРЕТИЧНА ТА ПРИКЛАДНА ЕКОНОМІКА

## THEORETICAL AND APPLIED ECONOMICS

## SESSION 6

### Введення інформаційно-комунікаційної системи у сільських місцевостях Польщі

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Сільське господарство відіграло важливу роль у розвитку сільської місцевості, а також світової економіки загалом. В наш час воно стоїть перед проблемами розширення виробництва в умовах зменшення кількості природних ресурсів, погіршення стану навколишнього середовища та збільшення ризику зубожіння та соціального виключення жителів сільських місцевостей. Це означає, що соціальна нерівність з'являється частково внаслідок того, що жителі сільських місцевостей мають обмежений доступ до послуг, якими міські жителі користуються регулярно. Одна із найбільш помітних диспропорцій в даному питанні - це доступ до інформаційно-комунікаційних систем (ІКС).

У Польщі сільські місцевості становлять 50% загальної території країни і там проживає 40% населення; 60% з них зайняті у сфері сільського господарства. Незважаючи на це, відносно низька частка сільського господарства у ВВП вказує на те, що потенціал існуючих ресурсів не задіяний повністю. Саме тому дуже важливо вжити заходів для стимулювання продуктивності сільських місцевостей.

Впровадження ІКС є одним із можливих стабільних способів ефективного реагування на низький рівень розвитку сільської місцевості, боротьби з бідністю та соціальним відчуженням.

Дана стаття зосереджена на доступі до основних послуг ІКС в Польщі, з основним наголосом на її сільських місцевостях. Вона досліджує потенційний внесок ІКС у рівень життя фермерів та опосередковано в ефективність їх роботи. Отже, тут аналізуються та порівнюються із середніми показниками EU-27 основні параметри, що характеризують процес комп'ютеризації.

Незважаючи на те, що переваги ІКС у сільському господарстві визнаються, їх популяризація у сільських місцевостях Польщі досі нижче середніх показників EU-27 і є фактично занедбаною.

Незважаючи на відносно високий відсоток власників комп'ютерів, які мають доступ до мережі, вони не використовують її повний потенціал (інтернет використовується рідко і в основному для розваг).

Проте, помітно, що всі параметри, що характеризують ІКС, мають позитивну тенденцію і різниця між містами та сільськими місцевостями з кожним роком зменшується.

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### The adoption of Information and Communication Technology in Polish rural areas

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*Agriculture has played an important role in the development of rural areas and generally in the global economy.*

*In Poland, agriculture still dominates land use. Nevertheless, the relatively low share of agriculture in GDP indicates that the potential of existing resources is not fully used. For this reason, it is crucial to take steps in order to stimulate effectiveness of rural areas.*

*The application of ICTs is one of various and persistent means to positively react to rural underdevelopment, poverty alleviation and social exclusions.*

*This article concentrates on the access to the main ICTs in Poland, with the main focus on its rural areas. It explores the potential contribution of ICT to the life standard of farmers and, indirectly, to the effectiveness of their work. Therefore, the main variables characterizing the computerization process are analyzed and then compared to the EU-27 average.*

*Although the benefits of ICTs in agriculture are recognized, the popularization of ICTs in rural areas in Poland is still below the EU-27 average and is actually neglected.*

*However, it can be observed that all of variables characterizing the ICTs are in positive trend and the gap between cities and rural areas is narrowing every year.*

**Keywords** – Agriculture, ICT, Internet, Polish rural areas, social exclusion.

## I. Introduction

Agriculture has played a remarkably important role in the development of rural areas and generally in the global economy. Since the majority of the world's population lives in rural areas, it remains a key economic activity. In fact, agriculture is not only the main source of food, but also of wealth and employment outside the urban areas.

Nowadays, agriculture faces challenges of enhancing production in a situation of dwindling natural resources, environmental degradation and increasing risk of poverty and social exclusion for people living in rural areas. It means that social inequalities appear partly because people living in the countryside have limited access to services which, in contrast, city-dwellers use on a regular basis (e.g. schools, hospitals, sports and cultural facilities) [1]. One of the most noticeable disproportions in this respect refers to the access to information and communication technologies (ICTs).

Although it is a relatively new phenomenon, evidence of the contribution of ICT in addressing the above mentioned challenges for rural areas is becoming increasingly recognized [3].

Adaptation of ICT provides significant potential in supporting the agriculture and related activities by innovative technological solutions. Implementation of automated, intelligent machinery ensures higher productivity. Internet, for instance, provides fast information flows and is an extremely valuable knowledge resource. It supports best practices exchange among the farmers living even far away from one another [7]. Finally, it increases the farmers' awareness of the negative impact of some modern agricultural practices on the natural environment and in this way changes their attitude towards agroecosystems.

Nowadays, the meaning of agriculture is transforming. In fact, farmers seem to extend their scope beyond the intrinsic food production activity to other functions. Indeed, despite producing food and other essential commodity goods, the sector follows new demands of the society. It also provides a wide range of non-commodity goods and services, shapes the environment, protects traditional cultures and cares about maintenance of regional communities [9].

For this reason, easy access to high-quality Internet is one of the tools which can release the potential of rural areas.

ICT improve traditional agriculture activities but also help existing rural enterprises to perform more effectively. ICT respond to business demand for rapid communication with both clients and suppliers, in the meaning of access to diverse kinds of information. Additionally, it creates greater scope for running new businesses in rural areas and it facilitates delivering vital resources [2]. In consequence, it offers opportunities for improving the overall livelihood of rural communities.

The countryside can actually benefit from Internet even more than urban centers. In fact, it may be a means of solving professional and personal problems in remote areas. The big distance from banks, shops or schools often restricts the use of these services. Internet can help to bridge this gap and eliminate social inequalities by providing a variety of e-services, [3].

## II. Agriculture sector in Poland

Poland, with its population of over 38 million people, shows a predominance of rural regions. It means that the majority of Poles live outside urban centers. Indeed, almost 40% of the population is established in the countryside. It contributes to 25% of total rural communities in the European Union. This places Poland as the biggest agriculture population among the rest of EU-27 [6].

The agriculture land covers almost 50% of the total area of the country and it is almost 9% of EU's farmland, Table I [6].

Table I

	TOTAL AREA [in this km <sup>2</sup> ]	AGRICULTURE LAND [% of total]	
		2000	2008
		EU-27	4 324.8
POLAND	322.6	55.2 %	48.4 %
Share of Poland	7.5 %	9.0 %	8.4 %

The Fig. 1 pictures the rural and urban area in Poland. The map was created with the OECD approach in which a rural area is defined merely based on the population density [4], [10]. In this case, the rural or relatively rural areas cover almost 93% of Poland.

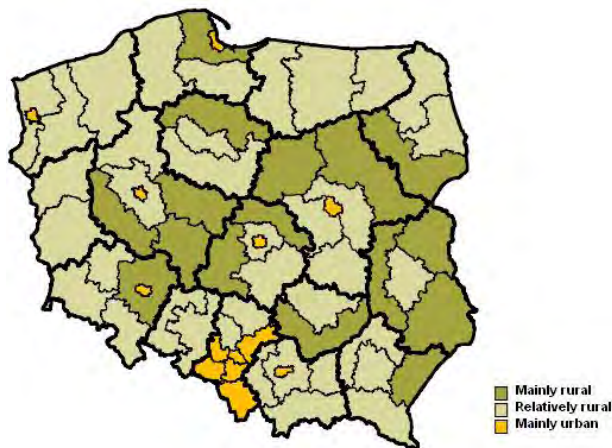


Fig. 1. Rural and urban areas in Poland (2008)

In Poland, nearly 15% of employees are engaged in agricultural activities. Although the share of the industry and services in total employment in rural areas is still increasing, the agriculture is the source of income of more than 60% of economically active population, Table II and Table III [4], [6].

Table II

Economically active population in poland

	2004	2006	2008
Total [in mln]	12.6	12.9	13.9
Rural areas [% of total]	25.7 %	25.8 %	25.0 %
Agriculture, forestry, hunting, fishing [% of total]	16.6 %	16.3 %	15.0 %
Agriculture [% of total]	16.5 %	16.1 %	14.9 %

Table III

Economically active population of rural areas

	2004	2006	2008
Total [in mln]	3.2	3.3	3.5
Agriculture, forestry, hunting, fishing [% of total]	64.6 %	62.9 %	60.3 %
Agriculture [% of total]	64.2 %	62.5 %	59.8 %
Industry [% of total]	16.8 %	17.9 %	19.2 %
Services [% of total]	18.6 %	19.1 %	20.5 %

It is worth mentioning that the structure of employment in the Polish economy differs from the European standards. In EU-27 only 5% population, on average, works in agriculture. Therefore, it is not a surprise that the share of this sector in the EU-27 gross domestic product (GDP) is scarcely 3%.

The Polish agriculture gives a bit higher share of GDP – about 4% - which, with relatively high employment in the sector, reflects very low productivity, Table IV [6].

Table IV

## Share of agriculture in gdp

	GDP *	of which gross value added	share of agriculture** in gross value added
2000	145.0	140.1	4.9 %
2006	179.2	171.5	4.2 %
2009	204.6	195.8	3.6 %
Average:			4.2 %

\*Constant prices, 1990=100, \*\*with forestry, hunting, fishing.

Covering more than 50% of the total area and 40% of the population, rural areas play an important role in the development of Poland. Nevertheless, the relatively low share of agriculture in GDP indicates that the potential of existing resources is not fully used. For this reason, it is crucial to take steps in order to stimulate the effectiveness of Polish rural areas.

## III. ICT in rural area

The diffusion of ICT is in general considered as an important tool for supporting economic development and functioning of the labour market.

ICT is defined by effective usage of computers, Internet, mobile phones, as well as traditional media such as radio or TV. It helps to deliver information to producers and that is why it improves economic viability of the agriculture. It makes rural areas more sustainable with particular attention to diversification of activity in the sector with simultaneous care of environment and animal welfare.

The annual survey concerning the information society, conducted by the Central Statistical Office in Poland (GUS), shows that the level of ICT in the country is rapidly increasing. In 2010 around 70% of urban households reported owning a computer. It is more than 10 percentage points when comparing to 2006. As far as the rural areas are concerned, in 2006 the computer was rather a rare good. Only one out of three households had a PC, while in 2010 more than 60% did, Table V [5].

Table V

## Households - Availability of Computers (in %)

	Urban area		rural areas
	Below 100 ths habitants	Above 100 ths habitants	
2006	46.4 %	52.9 %	36.4 %
2007	54.8 %	60.0 %	46.0 %
2008	59.6 %	64.0 %	52.8 %
2009	66.3 %	71.5 %	60.2 %
2010	70.3 %	72.9 %	63.0 %
Average	59.5 %	64.3 %	51.7 %

The share of households equipped with PC of all households with at least one person aged 16-74 in 2010 was just 2 percentage points lower than the average for EU-27 (71%) [8]. That is a big improvement for Poland as in 2006 this disproportion was equal to 11 percentage points (45% in Poland, 56% in EU-27) [8].

Nevertheless, disposing of a personal computer is not necessarily synonymous with its active usage. In fact, in

approximately computer is used at least once a week in 68% urban households whereas just 47% in rural areas, Table VI [5]. Such a phenomenon may indicate that although the computer is no longer a luxury good, it is rather purchased for either the prestige or entertainment, but not for an optimization of the daily work on the farm.

Table VI

## Households regularly using PC (in %)

	Urban area		rural areas
	Below 100 ths habitants	Above 100 ths habitants	
2006	44.8 %	55.4 %	30.8 %
2007	48.2 %	58.1 %	34.8 %
2008	53.7 %	59.9 %	38.1 %
2009	57.8 %	65.4 %	44.3 %
2010	60.1 %	68.1 %	47.3 %
Average	52.9 %	61.4 %	39.1 %

The common usage of the Internet, flexible infrastructure and lower prices of network access are all reflected in increasing number of households having Internet. The growing percentage of households with internet access still shows a positive trend. Over 65% of households in the big cities had access to the Internet in 2009 and 69% in 2010. The significant change can be observed in the population having access to the network in rural areas – the share in 2009 increased by more than 13 percentage points y/y and 17 percentage points for broadband access y/y. In 2010 this percentage increased to 56%. The difference between urban and rural areas declined to less than 13 percentages points when compared to 20 points rates in 2006-2007, Table VII [5].

Table VII

## Households having access to Internet (in %)

	Urban area		rural areas
	Below 100 ths habitants	Above 100 ths habitants	
2006	36.5 %	45.6 %	25.1 %
2007	43.7 %	49.9 %	28.9 %
2008	50.3 %	56.0 %	36.1 %
2009	59.8 %	65.1 %	50.5 %
2010	65.1 %	68.8 %	56.2 %
Average	51.1 %	57.1 %	39.4 %

In fact, percentages of households with Internet access at home in Poland are getting closer to the average of EU-27. In 2010 the difference was only 4 percentage points (63% in Poland, 67% in EU-27) [8]. The leaders are traditionally Iceland and the Netherlands with 90% households Internet access [8].

In today's economy we deal with a continuous change of business partners. Internet becomes the appropriate tool to facilitate the search for information about potential customers or suppliers, and also allows them to contact with one another electronically without spending additional money [3].

In 2010, the communication via Internet in urban areas was less than 40%. At the same time, in rural areas, only one third of users communicated via Internet. The typical

telephone features of the Internet uses only 14% of people living in countryside and nearly 25% in cities. Out of all the persons ordering or buying products via Internet nearly 40% come from big cities and just 21% from villages, Table VIII, Table IX [5], [8].

The share seems to be insufficient. Despite relatively high share of network users, they do not benefit from the internet potential to the utmost. Due to the common availability of the Internet, even small companies in remote parts should be aware that they can become competitive and may operate on a national or even an international scale. It might also make them more successful in the search for contractors in the country and abroad.

Yet, the tendency in online shopping is in positive trend with the 5 percentage point growth every year. Moreover, the average in EU-27 for all Internet users is also quite small and equals to 34%, Table VIII, Table IX [5], [8].

Table VIII

The reason to use Internet (in %, 2010)

	Urban area		rural areas
	Below 100 ths habitants	Above 100 ths habitants	
communication	34.9 %	38.7 %	26.2 %
forum	15.6 %	17.2 %	11.5 %
telephones	21.7 %	24.9 %	14.2 %
blogs	9.2 %	10.2 %	6.1 %

Table IX

Ordering or buying products via Internet (in %)

	Urban area		rural areas
	Below 100 ths habitants	Above 100 ths habitants	
2006	12.0 %	20.4 %	5.5 %
2007	17.3 %	23.3 %	8.0 %
2008	20.1 %	24.7 %	10.5 %
2009	22.9 %	32.0 %	15.8 %
2010	28.6 %	39.7 %	20.6 %
Average	20.2 %	28.0 %	12.1 %

## Conclusion

The role of agriculture and farm households in the global economy changes and becomes more diversified.

In Poland, agriculture still dominates land use, however the share in GDP is small with relatively high employment in the sector. Thus, it is crucial to look for a

new solution to optimize the production process in Polish rural areas. The application of ICT is one of various and persistent means to positively react to rural underdevelopment, poverty alleviation and social exclusions. Moreover, ICT responds to farm business demand for rapid communication with both clients and suppliers and provide fast access to information.

Although the benefits of ICT in agriculture sector are proved, the adaptation of ICT in rural areas in Poland is still below the EU-27 average and is actually neglected.

The share of Internet users seems to be insufficient. In spite of relatively high share of network users, they do not benefit from the internet potential to the utmost.

However, all of the variables characterizing the ICTs are in positive trend and the gap between cities and rural is still narrowing which brings optimism for the nearest future.

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