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Governance of Internet development in rural areas in the context of territorial competitiveness: the case of Poland

Abstract: *Modern Information and Communication Technologies are recognised as a main factor stimulating socio-economic development of urban and rural areas. The aim of this article is to investigate the ICT potential in the process of improvement in competitiveness of rural areas. The classical theoretical development approaches are presented in the context of ICT territorial distribution. On the basis of the case study conducted in Poland the main obstacles to the Internet development in rural areas are analysed. Potential role of the Internet technologies in the process of competitiveness improvement of rural areas is investigated. The analyses have been done with respect to different functional types of rural areas.*

Keywords: *governance, ICT, territorial competitiveness, rural areas*

Introduction

Strong competition for new investments and an access to markets as well as capital is a common feature of economies nowadays. This phenomenon can be observed not only from the perspective of businesses that compete with each other but also countries and regions (Sirkin, Hemerling, Bhattacharya, 2008). Such a process concerns in Poland counties, districts and provinces that are interested in improvement of both their competitiveness and living conditions of their inhabitants. An active participation of local-government administrative bodies makes them important players of local and regional development. It results from their engagement in economic processes, the introduction of innovations or widely considered mobility of labour and capital. Local and regional communities are perceived as research objects in the context of competitiveness of rural areas. The necessary condition for these communities is to have an aim which is focused on the development of certain area. A basis of competitiveness is a rise in efficiency that leads to a rise in incomes and thus living standards. Also institutional environment and arrangement have got considerable impact on economic development through transaction costs linked to market conditions, availability of information, necessity to negotiate and concluding deals and safety assurance (Williamson, Masten, 1999). In this process the lower level of transaction costs results from the better quality of institutions provides greater opportunities for economic success.

The recent research on economic development and improvement of regional competitiveness takes into account potential of new information and communication technologies, particularly Internet (OECD, 2003). They stress the across economy effects of the modern communication technologies while all sectors of the economy use information in their production process. However, ICT impact on economic performance is relatively more visible in the services than in other sectors of the economy. This suggests that ICT in primary sectors e.g. agriculture may be less effective in direct stimulation of development processes. Changing the perspective from agriculture sector to space related concept of rural areas development amplify the role of the ICT in development. This is justified by the growing role of non-agricultural activities in rural development (OECD, 2006). Improvement in communication stimulates economic changes in rural areas and utilisation of local resources to provide varieties of services. Simultaneously the ICT is recognised as influential on quality aspect of economy improvement (Sudoh, 2005). At the local level this is related to changes of the interaction structures between enterprises, government and citizens. While the direct improvement of economic performance results from more efficient information flow, the indirect effect is an outcome of reorganisation of local development stakeholders. The transformation process of rural areas connected with ICT utilisation improves the quality of life of rural people regarding the initial stage of development. Similarly to developed countries the introduction of ICT technologies in developing ones demonstrates their positive impact in all aspects of rural economy (Thadaboina, 2009). Generally, improvement of information flow resulted in better access

of the rural people to public services as well as in the growth of agricultural productivity and the improvement of living standards.

The unequal benefits of ICT can be explained by the differences in accessibility of modern communication technologies. This digital divide phenomena can be observed from different perspectives: racial, economic, ethnic and educational (Compaine, 2001). The differences in economic and educational level of development between urban and rural areas made the problem of unequal distribution of ICT a territorial issue. Lower accessibility and utilisation of modern communication technologies known as rural digital divide are clearly noticeable in less developed countries and regions (FAO, 2002). In most of them the problem of poor ICT utilisation is of economic and political nature. Therefore, it requires governmental actions to overcome technological and social gaps. At the EU level the rural areas are lagging behind urban ones in term of broadband Internet utilisation (European Commission, 2007). This is explained by the connectivity and content imperfections (Alakeson, 2003). Rural inhabitants usually have imperfect knowledge of the Internet potential and accessibility to the technology. Simultaneously the "user interface" and "design interface" are less friendly for rural population. Another explanation of spatial nature of digital divide problem in Europe is failure of liberalised market that is not able to provide telecommunications services effectively across regions (European Commission, 2005). The EU current policy stresses the importance of territorial cohesion and aims at providing better accessibility to Internet products and services in regions lagging behind in development.

Creation of successful policies aiming at Internet technologies diffusion in rural areas is the complex issue, because their results depends on a number of socio-economic conditions (OECD, 2001). Slow pace of spreading the ICT in rural areas is a result of, among others, pace of economic development, distance of administrative units to urban centers, local culture and history, information flow at the local and regional level or access to particular technologies and costs of their implementation. In the case of Poland households as well as economic entities, especially in rural areas, have been taking advantage of Internet technologies in a relatively short period of time because of late introduction of the technology and high cost of services (Poland…, 2010) . It is stressed that lack of competition between the Internet providers in rural areas results in relatively higher cost of these services. Therefore the local-government should undertake actions to support Internet infrastructure development or engage in cooperation with private Internet providers. This situation calls for an analysis in order to find out what are the critical factors which make the process successful on the local – commune level. Relation between the level of Internet development and competitiveness of local and regional communities from a theoretical and practical point of view is examined. A review of literature on development of rural areas and interactions between this process and the development of the Internet has been conducted. Legal framework in respect of the Internet development support by the public sector is to be analysed. Finally the empirical research on the basis of available stati-

stical data and questionnaire survey conducted in rural counties of Mazowieckie province is used for the assessment of the decisive factors of the Internet development and competitiveness improvement of regions.

Theoretical framework for the internet development in rural areas of Poland

Modern ICT are classified as an element of infrastructure and placed among most important factors of socio-economic development. This is directly linked with the growing importance of new economy by itself and its positive effects on other sectors of economy (Landefeld, Fraumeni, 2001). Improvement in information and data processing allows for better organisation of production processes as well as services supply in order to satisfy the market demand. In other words, economic entities that are advanced in ICT utilisation gain comparative advantage. This advantage at both local and regional level is likely to be observed in relatively well developed economies. Therefore, the base for the increase of competitiveness depends on the level of the infrastructure development, namely the Internet. This makes the development process time consuming with overlapping development preconditions. Overlapping depends on the regional or local specific features and reflects the possibility of the Internet technology and advantages resulted from high overall socio-economic level of development. In case of relatively limited accessibility to modern ICT its relation with the socio-economic development should be analysed rather from the internal specificity of particular territorial unit than standard action–interaction perspective. It means that ICT can be the driver of development for some communes but for another ones it can be the effect of development

According to prevailing theories, the ability to absorb new technologies is one of critical factors of region development (Pillai, Shannon, McKim, 1995; Florida, 2004; Törnqvist, 2004). The basic assumption is that there is a potential demand for new technology that is neither known nor presented. Polish rural areas can be characterised as potentially interested in adopting internet technologies while the benefits from its utilisation are visible in developed countries. On the other hand, the low level of the Internet infrastructure development can be recognised as an opportunity from private businesses perspective. The Internet in case of Polish rural areas should be recognised as a relatively new technology that has a potential for stimulation local development.

Absorption of new technologies is directly linked with diffusion of innovation process that is a major part of development processes. Reasons of the Internet territorial diffusion and its innovative character can be explained with the use of Rogers innovation diffusion theory (Rogers, 1962). According to Rogers process of innovation diffusion consists of four major elements: the type of innovation, communication between potential recipients, structures of target society and time perspective of which communication between potential recipients and structures of targeted society are related to the human factor. From

the perspective of Polish rural areas the level of local residents' knowledge of the Internet technologies and ability to utilise it is consider to be low. This point out the human factor among main obstacles in the process of the Internet diffusion.

The concept of innovation diffusion recognises a number of models of innovation spreading as well as information of that innovation (Meade, Islam, 2006). Among them the relocation and expansion diffusion concepts are mostly used for spatial distribution of innovation (Brown, 1981). The expansion diffusion takes place when the spread of innovation goes through a community and each individual is passing the knowledge to his neighbours. In such a way the area of dissemination is growing larger. This pattern of innovation diffusion is recognised as a prevailing in Polish rural areas (Floriańczyk, Czapiewski, Stawicka, 2007). However it requires active assistance of the public institution to introduce new technology to potential stakeholders.

In case of relocation diffusion spread of innovation is related to its movement from one place to another. While the areas are separated the innovation may not reach regions that are located between them. These two different patterns of innovation diffusion is of critical importance while the certain political actions stimulating development processes are planned (Yong-Tae Park, 1999). As observed in most developed countries technology diffusion is part of their macro-technology policy that aims at upgrading technical capacities of regions. Concerning the concept of relocation diffusion in the Internet innovation spreading at the commune level it is necessary that local or regional governments set out a framework for a policy in order to provide the peripheral areas with the technology.

Formulation of policy aiming at the Internet diffusion in rural areas can be supported with Christaller's central place theory (Christaller, 1933). This theory underlines dominant role of certain size towns at the regional scale. Because of their functional structure and influence on neighbouring area they are considered to be socio-economic centres. In this theory the concepts of threshold of minimum market size and range to define border of area of consumers acquiring goods form the centre. This theory was developed by A. Lösch, B. Malisz (1984), H. Beguin (1992), that pointed out hierarchic structure of cities in certain area from their functional type perspective. As regards the stimulation of the Internet diffusion in rural areas the urban centres are likely to be a major partner in this process. However, their influence according to the theory tends to decline with growing distance and technological improvement of means of communication. On the hands the process of technology development would lead to equalisation of the Internet accessibility and utilisation in rural and urban areas, making flat space, as suggested by Thomas L. Friedman (2005). Increasing up-taking of the Internet technology should result in decreasing the distance between centres and its periphery.

From the microeconomic perspective planning policy of the Internet diffusion it to be based on the theory of localisation (Lösch, 1961). Localisation of economic entities is determined by the scale of benefits and costs that are related with their activity. Concerning the Internet diffusion localisation theory has two major implications. Firstly, local community can undertake specific actions in order to increase the local level of Internet services. This way they provide attractive environment for investors and stimulate local economic development. The second implication of localisation theory is concerned with the Internet services providers. They are likely to concentrate their effort in larger, city located markets. This is justified with the relatively higher absorption of their services. In this light, the chances for improvement accessibility to Internet services of rural communes basing on free market are relatively small. Therefore, small communes are not enough attractive for Internet providers and should be supported in their efforts to provide Internet by central and regional policies.

The macroeconomic perspective localisation theory is a component of spatial economy that explains allocation of resources and economic activities over space and aiming at identification of effective space structures from the regional and national perspective. The spatial economy reflecting the original model of spatial organisation of agriculture production proposed by J.H. von Thünen (1826) further developed by E. Hoover, W. Isard, C. Ponsard, A. Weber and A. Losch. Their works pointed out the existence of optimal point of urban centre development that made further concentration economically unjustified. This could be recognised as a positive phenomenon from the point of view of the Internet development in rural areas. With the stabilisation of centres demand one can expect expansion of Internet providers to their surroundings. The globalisation processes boarded the scope of spatial economy while the new trade environment change the traditional way of businesses operation (Fujita, Krugman, Venables, 1999). Namely the globalisation process underlined regions as opposed to traditional national perspective for economic development analysis. In this light the process of expansion of services are likely to be observed firstly between regions that have high level of urbanisation. Recently conducted studies prove the existence of catching-up process is the diffusion of mobile telecommunications across EU-15 countries (Giovanis, Skiadas, 2007). An inverse relation between the speed of diffusion of the concerned technology with the time-delay effect suggests Internet services expansion to less developed regions.

The localisation theory explains the decentralisation of government power as a result of localisation dispersion. This phenomenon reflects the local administration underestimation of agglomeration localisation costs and benefits related to central administration consuming significant part of national incomes. The growing range of local government responsibilities and decision creates environment for participation in benefits related to agglomerations development. Namely the communes that are in close proximity to urban centres may benefit from extension of existing infrastructure. At the same time all rural

communes are required to apply for Internet base communication solution in administration offices. Therefore the public responsibilities stimulate process of Internet diffusion. This top-down approach made the administration technological leader at local level. The above described processes prove that the Internet diffusion and its relations with socio-economic development have a complex nature. The social contest in the socio-economic development process based on the technology diffusion was characterised by models proposed by Björn-Sören Gigler (2004) and Mitchell and Gillis (2005). The first one postulates that the dynamics of the Internet diffusion process depends on interrelationship between innovation and communes that are gaining powers from it' adoption. The relationship between the Internet and local development was characterised by Mitchell and Gillis as a multi-dimensional where the different stakeholders interactions deciding on its diffusion dynamic. This model can be adopted for analysis the balance between different stakeholder

The common opinion of the government stresses weakness of the infrastructure as a main obstacle of the Internet diffusion in Polish rural areas. This opinion is likely to underestimate the problem of local development stakeholders capability to adopt new technology. The central government actions aiming at upgrading technical capacities of regions might therefore lead to inefficiency. Particularly this to be a case of rural communes that are remote from urban centres as explained by relocation diffusion innovation concept. On the local level creation of attractive environment for private business with the use of public resources is required. This to rather overcome disadvantages of local market as compared to the cities and to encourage services providers. As a result of the increase of suppliers competition on local market improvement of the Internet accessibility is expected. The stressed role of local government in stimulation development processes should be balanced with the different stakeholders interests. The coordination of actions between these stakeholders as pointed out in Mitchell and Gillis model is consider to reflect the quality of governance of the Internet development in rural areas.

Organisational and legal possibilities of support of the internet development by the public sector, particularly by regional and local-government

Development of the Internet utilisation in rural areas based solely on market instruments meets with serious obstacles. This process can be slowed down and sometimes even brought to a halt by, inter alia, low population density, idiosyncrasy of settling network and population's incomes. In some cases all the characteristics of local community determine low demand. Thus investment made by private sector can be inefficient. As a consequence, the disparities in economic potential and quality of social capital keep on growing. In order to counteract the increase of these negative phenomena it is possible to undertake coordinated activities at different levels of central and local-government's administration. According to the Constitution of the Republic of

Poland "(…) social market economy, based on freedom of economic activity, private ownership and co-operation among social partners compose the basis of the economic system of the Republic of Poland (…)" (art. 20), and "(…) public authorities conduct policy leading to full productive employment (…)" (art. 65). Achieving this goal directly supports actions to be undertaken by different level administration to facilitate the development of the Internet . The choice of forms and range of engagement of local-governments in the development of the Internet should be based on results of cost-benefit analysis. This to take into consideration local community social costs and benefits. Moreover, supporting the Internet development by local-governments is justified by constitutional regulations concerning shaping human capital. The Constitution obliges public authorities to:

- supporting guidance and professional trainings (art. 65)
- elaborating individual systems of financial support for children and students in order to ensure equal access to education (art. 70).

To a significant extend the activity of local-governments in fulfilling the above tasks can be employed to improving the level of the Internet knowledge and the possibility of using them for economic development in the community territory. Moreover, individual support systems can include ensuring access to these technologies. In the context of such activities of vital importance are the constitutional rights of local-governments for associating and entering international associations of local and regional communities (art. 172). These activities in international organization can contribute to transfer to local communes already tested and functioning solutions. It is expected that from one hand the speed up of the process of spreading the internet on local level will take place and from the other hand local-governments expose to unnecessary costs will be lower.

Mazowieckie region case study - main obstacles for the internet development in rural areas

The theory of central place as an explanation of the Internet diffusion indicate the Mazowieckie region in Poland as most suitable to illustrate the related socio-economic processes. The centre of this region, Warsaw, the capital city, influences development of other satellite cities as well as rural areas. The neighbouring small cities and rural communes are of low development potential in terms of becoming providers of knowledge intensive services. Centre of the region is growing in importance due to economic development and expansion of its endo- and exogenous functions. According to central place theory, self-development and utilisation of Internet technologies result in growing disparities between advanced cities and peri-urban and rural areas. Public policy aiming at Internet diffusion in order to provide equal condition for development of different areas should be therefore harmonised at local communes as well as regional levels of administration. Case study of the Internet in Mazowieckie region rural areas was conducted on the level of

commune (Banski, 2008). These were selected represent diverse functionality and endowment patterns, the latter both in terms of natural resources and the man made ones, including the opportunities offered by the particular location. Research covered 85 communes of which 14 were rural-urban ones and 71 rural enabled the identification of the Internet development barriers at the local level. The questionnaire was directed to representatives of three major groups of the Internet stakeholders (Floriańczyk, Wasilewski, Chlebek, 2009): 1) Internet expert – specialist most familiar with current Internet issues at the community level, 2) Local economic leader – the expert with an economic orientation and 3) Administrative leader – the expert representing the interest of the community.

The examined communes varied significantly in spreading the internet access. On average 27% of residents in these communes had the internet access in any form. In rural-urban communes access to the internet (35%) was by almost 10 percentage points higher than in rural ones. Whereas, rural communes were characterized by wider range in the share of population with the internet access (from 5 to 80%). In case of rural-urban communes, especially the ones located around large urban centers, the differences in the internet access were much smaller. The research showed that the most burning issue that limits the internet development is the income situation of the residents (figure 1). This problem affects in the sane degree people living both in rural as well as rural-urban communes. This issue was considered important in over 85% of communes of the first group and over 80% of communes in the second group. The next economic barrier in the internet development is the insufficient level of local-governments' incomes not enabling them active support of undertakings serving, for example, extension of technical infrastructure (optical fibre network, radio transmitters, etc.), or co-financing purchasing of computer equipment by public institutions (schools, libraries, healthcare centers, etc.). The problem of insufficient local-governments' incomes was indicated as important barrier in the development of the internet in 60% of rural communes and in 57% of rural-urban ones. Difficulties in development of the internet are also caused by the lack of sufficient support from local-governments of higher level or central institutions. In more than a half of the surveyed communes these issues were considered as one of the most important development barriers. As a cause for insufficient development of the internet network there were also mentioned personnel shortages and lack of network development specialists (such answers were given by 1/3 of analyzed units). Other barriers included underdeveloped competition in the market of internet providers (this problem was considered important by 50% of the surveyed rural communes and 40% of the rural-urban ones) and the unwillingness of alternative operators (other than the largest fixed telephony Polish operator) to undertake investments in the areas of low density rates and low income levels. However, findings of the research indicate large interest in the internet's development among residents, entrepreneurs and farmers. Only in one of ten of surveyed communes lack of such an interest among the named groups was indicated as an important barrier to development of the network.

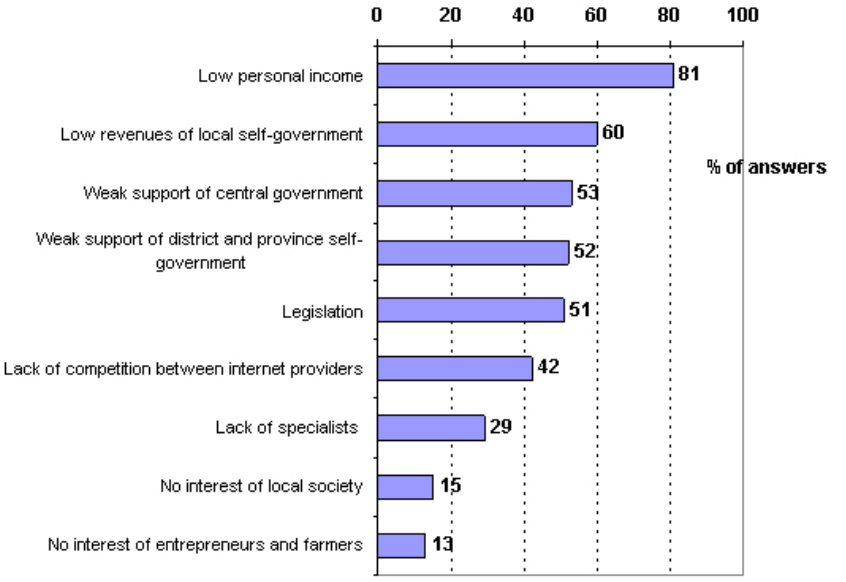

Figure 1. Barriers to development of the internet in the surveyed communes

Mazowieckie region case study - linkages between internet development and functional type of a local administrative unit

New ICTs are considered to be a factor stimulating socio-economic development in urbanized as well as strictly rural areas. Such a linkage appears at the moment of achieving relatively high level of endowment with a given technology, in our case the internet. However, achieving this level requires relatively long period of time. Yet, in the act of developing a given technology in a specified administrative unit the turn of dependence vector between the Internet endowment and socio-economic development can be opposite. Moreover, in some circumstances this relationship may not occur. Research conducted in mazowieckie region confirm that internet accessibility in households did not present any statistically significant dependence with communes' socio-economic potential. Considerable diversity among communes in terms of their internet development and relatively low number of connections to the network in communes with the highest internet accessibility show that this technology is only at the phase of popularizing. The pace of internet popularizing in the surveyed group of communes was neither a factor of their socio-economic development nor an effect of their high socio-economic potential. The pace of popularizing the internet at a local level was conditioned by the administrative unit's function. Dominating functions of particular units, such as residential-commercial, tourism-recreational, agricultural and peripheral, determine specific social relations closely related to information flow, in this case information flow concerning new technologies. These relations also condition the way of exercising the power by local local-governments and determine the influence of public consultations on decision making process.

The conducted research shows that specific functional types of communes significantly varied both in their internet accessibility to households and their socio-economic potential (figure 2). The analysis enabled finding some patterns. The lowest accessibility rate was observed in peripheral commune (18,7%), at the same time having the lowest socio-economic potential. Whereas, the highest rates were observed in communes representing tourism-recreational type (37,7%). Between these extreme groups there were agricultural communes (29,5%) and residential-commercial ones (22,2%). This last type was also characterised by the highest socio-economic potential.

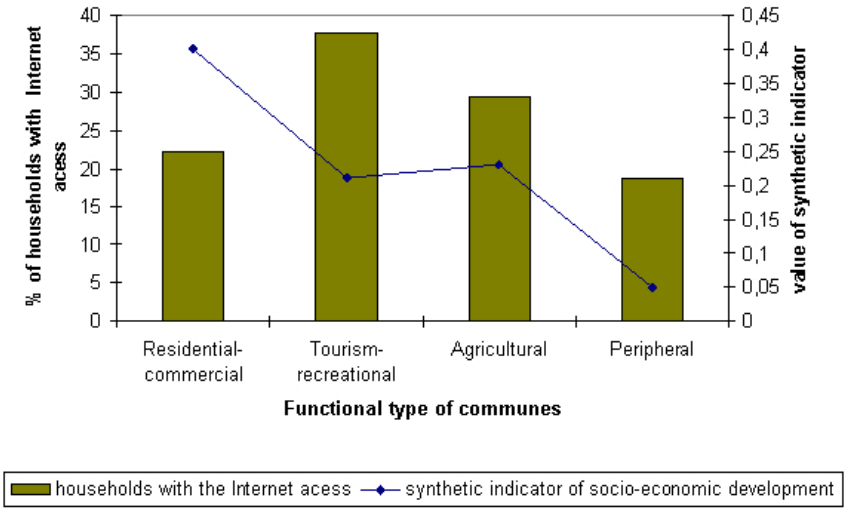

Figure 2. Internet accessibility and socio-economic development potential in different functional types communes of Mazovieckie region.

Distribution of access according to commune types and their synthetic measure of socio-economic potential attest a very difficult situation of peripheral communes. It is certain that in the near future the access to these technologies will not elicit development of these communes. Concurrently, a dynamic internet development will not take place. The differences between this functional type and the others will deepen. The only way to counteract it is through elaboration and implementation of cohesive strategy envisaging participation of external partners representing both public and private sector in local development. A different situation is observed in communes of residential-commercial type located generally in the proximity of large cities. Their residents have common access to this technology at their workplaces. In this type of communes there is also a higher number of economic entities registered (than in peripheral ones) for which internet technology is essential. High economic potential of these communes gives possibility of accelerating pace of equipping local households with internet access even without the necessity of engaging local-governments in this process, that is with the exclusive participation of private sector. Yet, another nature of ICT development is observed in tourism-

recreational and agricultural communes where there is relatively the highest number of households with the internet access, despite a significantly lower socio-economic potential than in residential-commercial ones. In this type of communes internet technology is in a much more significant level used both by households and entrepreneurs. For agro-tourist entities and non-farming families offering tourist services in the rural areas this is the cheapest and sometimes even the only accessible form of promotion of conducted activity and advantages of local culture or environment. The advantages of using this technology are increasingly acknowledged also by farmers looking for ways of improving the profitability of their farms. In these two types of communes a systematic development in access and use of internet should be expected. Their relatively low economic potential will be a factor hindering this growth. In this case it would be profitable to a higher extend engage public sector in supporting this process.

Mazowieckie region case study - the scope for the internet use in order to improve the competitiveness of territorial units

The range of possibilities for making use of the internet in rural areas constantly widens. High speed internet access strongly conditions commune's economic and social development as it becomes the precondition for functioning of enterprises and activity of its residents at the labour market. Strong correlation between the level of Internet utilisation and productivity grow proves critical role of this technology in creation comparative advantages on country and regional level (EC, 2007). The same reports indicate that in Poland the level of the broadband internet take-up among citizens is among the lowest in Europe. Therefore the development processes are likely to be slowed down by poor access to this technology. Access to the Internet, especially in smaller localities, is of tremendous importance for the development. It can lead to more intensive population's activity as well as easier access to, inter alia, education, job offers or legal regulations Owing to the internet access it is easier to attract tourists, producers can more in a simpler way finds customers and establish business relations (Mehrtens, Cragg, Mills, 2001). Internet access signifies, among other: possibility of settling official affairs, regulating payments, making use of bank accounts. Farmers have the possibility of on-line monitoring of, i.a., price quotations from commodity exchanges and market places, which helps them in planning sales, facilitates transactions at the agro-exchanges, whose number keeps on growing. The internet is also an up-to-date and source of knowledge concerning cultivation technologies. It also enables the exchange of experiences at countless internet forums devoted to the agriculture. Its educational value both for children and adults also needs to be underlined

The research conducted in communes of Mazowieckie region concerning their residents' potential interest in public services provided via the internet showed that it would be most often used to satisfy their needs for

using the internet library resources - 86% of all the answers. It seems to be a logical consequence of growing popularity of this type of services among internet users and increasing internet resources of this type. Also a large number of responses, more than 75%, mentioned using the internet for settling official affairs, such as filing tax declarations, making use of job offers from labour offices' sites, registering in healthcare centres and hospitals (e-health) and ordering official declarations and duplicates. Further places in the popularity ranking of services were taken by: formalities related to obtaining personal documents, registering vehicles or domicile registration. Nearly 70% of the total number of respondents reacted positively to the perspective of providing an on-line access to such services by local authorities. Lack of acceptance for on-line services in the surveyed population was low and amounted to 16-20% ("no" answers). Half of the surveyed respondents expressed positive opinion on the perspective of having the possibility to file complaints at the police or enrol children to creche, kindergartens or schools via the internet (1/4 of the surveyed did not see the possibility of accessing these services on-line). At the bottom of the ranking there were activities concerning outlook on life. About 44% of the respondents thought that it should be possible to accomplish formalities related to baptism, wedding or similar issues via the internet, whereas 1/3 expressed a negative opinion.

Findings from the conducted research show that there is large diversity among different functional types of communes in their potential demand for public services provided via the internet. An analysis that was focused on this issue enabled the identification of some regularities. The lowest readiness for making use of intenet services (figure 3) was observed in tourism-recreational communes, where only slightly more than 50% of the surveyed population gave either the answer "probably yes" or "definitely yes". In these communes more than 1/3 of the surveyed population has a negative attitude towards providing some public services via the internet. In agricultural communes this readiness was at a slightly higher level amounting to almost 2/3 of positive responses. Lack of acceptance for e-administration was much lower in this group of communes than among tourism-recreational ones (app. 20% of negative and definitely negative answers). The highest acceptance level for transferring the contacts with organs of administration to the internet was observed in two groups the most different in their level of socio-economic development and location, that is: residential-commercial and peripheral types. In both cases the proportion of positive responses to the question concerning the readiness to making use of services provided via the internet reached more than 75%, whereas the share of negative responses was relatively insignificant and did not exceed 6 and 14%, respectively. In the surveyed population of communes there were 66% of positive responses to the posed question and 18% of negative ones.

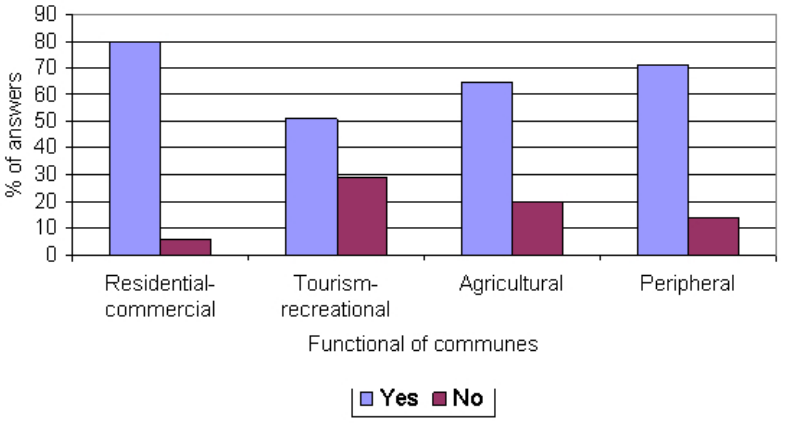

Figure 3. Demand for on-line public services according to commune types (proportion of accepting answers or non-accepting ones to the possibility of accomplishing some formalities via the internet)

Future research directions

Lack of profound identification of communes' equipment with the internet technologies limits the possibilities of preparing more efficient development strategy and improving the competitiveness of rural areas. Thus further research concerning profound identification of communes' equipment with this infrastructure is necessary. Such research projects should also include providers of teleinformation services. It would even be better to conduct these project with participation of services' providers in order to prepare an initial assessment of costs linked to the implementation of these technologies in rural areas.

The impact of spreading the internet access in rural areas can be limited if central institutions together with local-governments at lower levels of administration do not prepare a strategy for popularizing the technology based on precise criteria of differentiating the policy towards specific functional types of communes.

Development of modern ICTs (mainly the internet) is an important factor in the development of enterprises and improvement of rural areas' competitiveness. In Poland this factor is still seriously underdeveloped and used by its residents and entrepreneurs to an unsatisfactory degree. Thus there is still a need for greater and more effective involvement of administration organs in developing and popularizing the use of modern ICTs. For this purpose it is necessary to conduct research concerning linkages between the expansion of modern information and communication networks and sustainable and cohesive socio-economic development at a local and regional scale in national and European contexts.

Conclusions

Conducted research indicates low level of incomes of local population and administration financial constrains as the main obstacles in internet diffusion to rural areas. These problems are followed with the obstacle reflecting deficiency in basic telecommunication infrastructure required to provide internet services. Potential private business offering such services are not interested in investing in Internet infrastructure in rural areas. This because low level of incomes and density of population does not provide environment to generate satisfactory profits.

Problem of information asymmetry that reflects an imbalance of power in transactions is recognised as among major market imperfections. This phenomena has a direct influence on competitiveness of rural businesses that are experience insufficient access to information. Development of the Internet technology regarded as a most important communication means in last years, has a potential to reduce the information asymmetry between urban and rural areas.

Conducted study underline the strong dependence between level of socio-economic development of rural communes and their functional types. Surprisingly higher level of socio-economic development wasn't accompanied with the significantly higher internet accessibility. Therefore the dynamic of the Internet development was imperceptibly recognised as a development factor of all commune types. This study proves that level of the Internet utilisation is strongly connected with the functional type of communes. The analysis conducted regarding the functional types of rural communes exposed that peripheral communes are most disadvantage regarding internet diffusion. Therefore the internet technology in this type communes is unlikely to become leading development factor in short time perspective.

The possibility to actively stimulate internet diffusion are limited from the rural communes budget perspectives. Their low economic potential causes scarce budget to finance large infrastructure projects. This implicate the possibility to ample the development disparities between different types of rural communes.

To counteract the negative process of growing development potential between different types of communes the cohesive strategy should be worked out. The strategy that takes into account local and regional partners should incorporate in the process of its formulation representatives of private sector.

High economic potential provides the environment to stimulate Internet development with inextensive engagement of public bodies – based on private business. High demand in tourist-recreational and agricultural type communes implies the development of Internet technologies. However this process is slowed down because of low level of economic development of these communes.

The Internet development policy on different regional levels should take into account the differences of functional types of rural communes. These in order to increase the effectiveness of public money (including European Union found) utilisation devoted to Internet infrastructure development. Local-governments could improve the efficiency of the Internet diffusion process with providing the platform for social dialogue between all local development stakeholders. Such social consultations are proposed to provide to fulfil the common platform requirement.

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