Telecottages: Hopes and Results in Rural Development[1]

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Rural development is a constant challenge in every region, all around the world. To various extents and in different forms, but rural areas are coping with significant social and economic disadvantages both in the developed countries and the former socialist countries of Europe, as well as of other continents. Many researcher and politician believed that the digital revolution, the headway of the information society would greatly contribute to the decrease of social and regional inequalities. But these expectations have not been validated by any data.

Location of telecottages in Hungary supports the fact that the digital "revolution", the results of the information society do not increase the probability of underdeveloped rural areas' closing up, rather they sustain, and, in some cases, enhance the disparities.

Keywords: telecottage, rural development, regional inequalities, human resource

1. Introduction

The notion of the information society has emerged in literature in the 1960s. It quickly gained popularity, partly because it was expected to significantly diminish social and economic disparities in access to and disposing of information. All the new technologies ensuring the circulation of information enhanced the perception of the globalization and supported the approach that they help to achieve the decrease of the inequalities. So the gap between developed and underdeveloped countries, regions and areas can close.

From time to time, people's mind gets infected with the belief in the all-might

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of technological development. The emerge of new mass communication tools – from wide-spreading printed press through the start of the radio and the television (from the last half of the 19th century) up until now – has always created such an illusion. There are other approaches, which treat the effect of mass communication as merely technical or technological issue, and these are similar to those "illusionist" approaches that treat the problem of social and regional inequalities as a simple technical or technological issue, and expect the broadband Internet penetration to decrease these disparities. Regarding the effects of mass communication, by now, at least the researchers and the literature have managed – more or less – to overcome these "teething-troubles". However, regarding the Internet and other digital technologies, the public opinion and the political thinking still follows "schoolboy logic".

The effects of the new information technologies, the information society, and the phenomena of the digital divide can be examined through several approaches and at many different levels. One part of the studies represents a digital horizon expecting the penetration of the digital technology and the Internet to diminish the differences between developed and developing countries. Other part of the studies, thinking over the chances of closing up certain regions, expects the same, but analyse regional inequalities within one country. Studies, representing a third kind of approach, emphasize the various situations of the different social levels, mainly by examining the entrepreneurs or the poor. In this paper, within this topic, we focus particularly on the regional correlations and inequalities.

2. Literature

2.1. Dreams and the reality

Early sources of the literature are full of great, optimistic expectations. For example Edwin (1978) believed that achievements of the information technology would greatly contribute to the close-up of the underprivileged rural areas, especially concerning the development of business ventures. James (2002), in order to close the digital divide, primarily emphasized the necessity of access to cheap IT tools. But James hardly paid attention to the cultural and sociological barriers, just like that IT conference held in India, in 2000. Permkumar and Roberts (1999) went further, and simply ignored the social and cultural factors when they examined the application of the information technology. Beside many other studies, Cavill's paper (1997) also represents this optimistic approach regarding the Australian situation. Studies published in Hungary also expressed similarly optimistic expectations, even recently (Varga 2000). For example Forgács (2008) strongly believes in the penetration of telework (formerly known as distance work), and he tries to present the economic benefits of the telework houses. There are governmental papers and presentations on

telework penetration, but there are no data on the regional distribution of the telework. We can only assume that telework cannot help to overcome regional disparities, since more than half of Hungarian teleworkers are highly educated seniors.[5]

After a while, of course, the critics had arrived and the tone of the literature has changed. The enthusiasm fell off, and those issues came to the fore that – beyond the technology change – prevent closing the digital divide. Gillespie (1987) showed that access to and use of new IT tools is much more restricted in the underdeveloped regions of Western Europe. Pick and Azari (2008), after analyzing more than 70 countries, have concluded that the digital divide between developed and developing countries is apparently not closing. Grimes (2000) criticizing the EU policy of information society points out that the European Union follows an explicitly technological approach toward the issues of the information society, and as a result of ignoring the social and cultural factors, huge amount of money and facility run to waste. He claims that to utilize the new IT tools, components of the human dimension have to be taken into consideration. This statement is the conclusion of that Hungarian survey in which researchers examined the operation of the so-called eHungary-points. These e-points as technical solutions slightly decreased the digital divide between urban and rural areas (at least concerning the technical possibility of access), but, more important, the usage is quite limited, and the demographics of the users (social level, occupation, qualification, age) are almost totally unknown (Pándi–Takács 2006). Social inequalities in Internet usage generally show that the more privileged social groups are in the more favourable situation, so the decrease of the digital divide is not proven in this sense either (Albert et al. 2007). Angelusz and Tardos (2004) indicate serious social inequalities in Internet usage, regarding not only the intensity, but also the quality of the usage. Homoki (2002) claims that the most significant selective factor is the type of settlement and indicates that smaller settlements fall behind.

Previously international organizations had put pressure on developing countries to remove legal barriers that prevent the penetration of new information and communication technologies (like Internet). Deregulation was expected to jump-start the economic growth, thanks to the fact that these countries join into the international trade. Ngwenyama and Morawczynski (2009) recently have criticized this approach and pointed out that deregulation of the early 1990s was insufficient, since political efforts ignored social factors such as conditions of the human resource, cultural characteristics or the weakness of the civil sector. According to the data of Rodriguez and Wilson (2000) although developing countries reached some results concerning information technology investments, but the digital divide has widened in the last few years of the 20th century.

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[5] http://www.tavmunka.org/content/view/656/236/

Advocates of the knowledge society have also expected much from this paradigm, for example in accordance with the decrease of regional disparities. In recent years in Hungary a political version of this technological approach has emerged, in which there are expressions like "intelligent town", "intelligent region", "intelligent settlement", etc. It is accompanied by certain information technology innovations, like establishment of networks and planned services, but without thoroughly analyzing the social and geographical characteristics of employment and usage. (Pintér 1999, Molnár et al. 2007). Apart from the fact that knowledge society presently exists only in some of its elements, though its virtual establishment progresses forcefully and its language spreads well (Varga), one of Work Foundation's studies demonstrates that in Europe the indicators of the knowledge society created a situation that enhances the sustenance (increase) of the regional inequalities, and regions of Eastern and Southern Europe are in a devastating disadvantage even in this field (Rüdiger-McVerry 2007).

2.2. Information society and rural contexts

Cleevely and Walsham (1980) have relatively early set out their problems concerning the possibilities provided by the new tools of telecommunication. There is no clear correlation between the development of underprivileged regions and the new communication tools, they wrote, and these circumstances should warn the creators of development policy. In the midd-1980s, Mowlana (1984) warned that the consequences and effects of the information revolution are uncertain in many aspects, and we should carefully form our opinions about how it changes the lives of rural areas and the people living there, and to what extent it can be the engine and facilitator of the development.

Malecki (2003) warned that information technologies do not provide quick solution to the problems of underdeveloped rural areas, since those are influenced by long term processes. Penetration of digital technologies is just a small piece of rural development. It opens up certain "doors", but it is insufficient to have anyone to step in. Berkeley et al. (1996) drew attention to that rural areas cannot be treated unitedly. Concerning access to and usage of information and communication tools politics have to create different goals and assign different tools to underdeveloped regions and regions being in a more favourable situation. There are two important packages of measures for underprivileged rural areas: on the one hand, the number of telecottages has to be increased, and, on the other hand, there is need to be an educating activity involving and contribution with local governments and educational institutions. According to Mehta and Kalra (2006) new information technologies, theoretically, are able to contribute to diminishing the poverty, developing human resources and services. But, practically, by analyzing Indian examples, they experienced that the lower levels of the social pyramid have a more difficult access to these services and they utilize them less effectively. Similarly,

they see several problems in the fact that the most underdeveloped regions are mostly crowded out from access to telecottages (in India: kiosks). They think that during planning the usage of the technology it is particularly important to focus on that the conditions of the operation should fit to the social and cultural standards prevailing in the region, and the services should be offered free or affordable prices even for the poorer levels, to avoid deepening the social inequalities. The study of Mehta and Kalra, drawing away from the simple technical approach, demonstrates the importance of cultural context. Many Hungarian researchers share the idea that purely the technical tools are insufficient to bridge the digital divide (Lengyel et al. 2003, 2004).

Technological changes and new technologies – the technological foundation of information society among other things – are double-edged weapons in the rural America, writes the editor's letter in the 1st issue of *Technology in Society* in 2001. Peter Korsching (2001) proposing an essential dilemma, indicates that despite several forms of help and support certain rural areas in America keep lagging behind. Technological changes of information revolution and the digital tools were considered by many people as a possibility, and they hoped that underprivileged rural areas can be taken back to the mainstream of the American social and economic life. Korsching, in accordance with the new technologies, observed the following main issues: on the one hand, the access to these technologies is difficult due to the unequal development of infrastructure; and, on the other hand, people living in the country lack the required knowledge and skills. There is also a third, increasing issues. Internet usage by content is getting fragmented, claims Cavanagh (2009), and this condition is exclusive, since it requires special communication. People with lower level of qualification, living in underprivileged regions (civils, entrepreneurs) hardly can meet this requirement. In other words, the condition of human resources is a major barrier in utilizing the new tools. Corea (2007) also emphasized the effect of human resources' condition when studied how the innovations of information technology can serve the development. Birnie et al. (2005) emphasized that narrow technological, infrastructural approach without social contexts does not provide appropriate explanation for the problems of rural areas. Pigg and Crank (2005) claim that there are only a few evidence supporting that the intensive use of information and communication technology would lead to economic growth in underprivileged rural areas, even without major efforts for developing human resources and enhancing social cohesion. In Hungarian literature Nagy (2007) shares this opinion and searching access disparities draw attention to the importance of lifestyle and knowledge style factors.

Bruque and Moyano (2007) analyzing the penetration and usage of advanced information technology emphasize the effect of the socialization process, and that the usage of information technology heavily depends on the conditions of small enterprises' human resources. Studying Iranian small enterprises, Fathian et al. (2008) came to the same conclusion. Their results showed that accepting the tools of

the digital culture is primarily correlated with human resource and qualification/skills. Pleitner (1989) refers to the different cultural background of small enterprises, when analyses the usage of information revolution's technologies. Altobello Nasco et al. (2008), concerning the usage of information technology tools, emphasized the effect of social psychology factors.

Reviewing the literature has reassured that our approach is right. The effect of all the phenomena of the information revolution has not verified – nor locally, neither globally – the opinion of those who expected breakthrough on the front of social and economic inequalities purely by the spread of the tools. The digital divide, or in a newer and broader meaning, the digital inequalities (DiMaggio-Hargittai 2001) still exist, both in the dimensions of social and regional inequalities. We are aware of the fact these to kinds of inequalities are not independent from each other. The spread of new technologies in underprivileged rural areas is more difficult, and people living there have a more difficult access to these new technologies, but this is due to their cultural disadvantages as well. And these cannot be defeated with technical, infrastructural tools. A new methodology approach for measuring digital disparities proposed by James (2008) has a similar starting point. The fact that the usage of digital information is concentrated to socially favourable levels means that disparities are intensifying, even within one area, and this cannot be handled with traditional measuring methods. So statistics show a better picture than the reality.

Hereafter we discuss the location of telecottages in Hungary. Our initial hypothesis is that the telecottages do not live up to expectations in that sense that they do not manage to play an effective role in getting over the social and locational disadvantages. In our opinion this – among other things – is due to the fact the neediest settlements cannot get into or fall out of the network, because their human resources and social capital do not help them to reach and/or keep the establishment of telecottages. However we have to mention that this – as we have seen it – is in line with international experiences, and the biggest responsibility lies on the sector policy – but this could be the topic of another study.

2.3. Rural Hungary and Telecottages

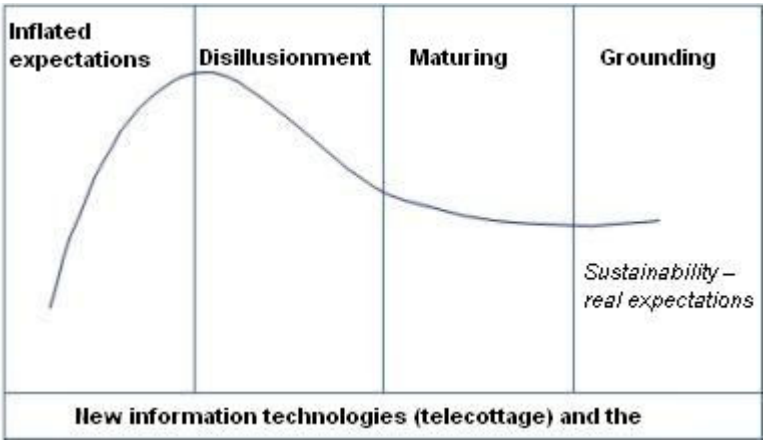
The purpose of our study is not to present the history of the telecottage movement or the evaluation of its operation. Relevant information can be found in the website of the Hungarian Telecottage Association (surveys) and in the studies of Erdősi (1992), Gáspár-Takáts (1997), Hohl (2006) and others.

At the start of telecottages and telecottage movement in Hungary, as we mentioned it in the introduction, there were serious expectations regarding the effects of information technologies (Gáspár 1999). In many cases these expectations were unfounded, and in our opinion, caused significant disadvantages to the movement. Later, both in Hungary and elsewhere in the world, the opinions and the approaches have changed. Jakobi (2007) regarding the spread of information and

communication technology tools draws attention to the enhancement of disparities in the existing social and economic processes, although believes that as a result of the activities of telecottages the information society can be expected to become more active. Grounding the point of views is significantly set back by the fact that the impact and efficiency assessment of telecottages has not been conducted yet in a scientific level (Hohl 2004).

Rao (2008) compares experiences gained in Indian telecottages – regarding social and social political acceptance – to the Gartner hype cycle that is well-known in the world in Jackie Fenn's explanation. The following figure shows the curve applied to Hungarian telecottages.

Figure 1. Gartner hype cycle relevant to telecottages



Source: own creation based on Rao (2008)

Experiences gained in Spanish telecottages confirm that from the point of view of telecottages' efficiency, namely getting over regional disadvantages, the social grounding into the local communities is vital (del Aguila Obra et al. 2002). Hungarian telecottages are more or less in the phase of maturing and grounding.

Unfortunately, as we have mentioned earlier, there are errors in both the methodology and the topics of the Hungarian impact assessments and surveys we know, so we can draw conclusion from them only in a restricted manner. There are also several problems in handling the database and in organizing the impact assessment. But this is mainly due to the indecisive appreciation and subsidy approach of the politics, not the lack of expertise. Grounding telecottages into the local society and its institutions – not surprisingly - bears characteristics of operation of the local society and politics. Sociological factors influencing the operation of telecottages get on in these circumstances.

Madon et al. (2009) – based on Brazilian examples – claims that the conditions of successful institutionalization of telecottages are not technological, but social factors, like positive appreciation of the local society, enhancement of social activity, etc. Similarly, an OECD report also originates from cultural and social factors the Scandinavian telecottages' success over Scottish ones in underprivileged areas (OECD 1996). Kleine (2009) observed that when entrepreneurs in underdeveloped regions of Chile employ the services of telecottages (telecentros), because of poor knowledge and skills they cannot work off their handicaps. The government of Chile assumes that they cannot enhance the social and regional cohesion. Lentz and Oden (2001) have conducted an analysis in the Mississippi Delta region, and drew the conclusion that regional policy makers have to understand that the most important issue is not simply increasing access to the technologies, but the development of the knowledge and skills required to use them. Apparently, human factors play a core role in the efficiency of telecottages, and this does not include only the leaders, managers and employees, but also the social and cultural characteristics of the region. The change and/or transformation of these factors in Hungary can only take place as a result of a process overspanning several generations. Everywhere, but especially in Eastern Europe politicians are interested in short term successes spanning from election to election, furthermore the economic elite can claim its interests in a more powerful way than underprivileged settlements, so long term investments into the development of human resources mostly are not compelling enough.

3. Methods and Results

Our core purpose, as we have mentioned, is to examine the location of telecottages and its correlation with the social and economic characteristics of the region and the settlement. With this in view we have combed together two databases and then chose the indicators of our analysis. The dependent variable was the presence of telecottages. That lead us to distinguish settlements and regions, which had a telecottage, but currently don't; which earlier had had a telecottage and currently also have one; which earlier had hadn't a telecottage, but currently have one; and which haven't had a telecottage at all. These databases did not provide us information about the operation of telecottages, but we did not intend to obtain such information.

Those settlements that had had or currently have a telecottage were considered to be “involved”, since once they have successfully applied for establishing a telecottage. This variable divided the settlements into two groups: involved and not involved. The initial rough analysis shows some interesting results. It turned out that 21.6% of settlements in the Central region are involved, and on the

other end of the scale we found Northern Hungary with 10.6% of settlements involved. Altogether there was or is a telecottage in 15.8% of the country. This result makes it probable that not neediness is the only factor that interplays in the successful establishment of telecottages.

Relationship between presence / current state of telecottages and size of the settlements is shown in the table below.

Table 1. Number of settlements in respect of telecottage involvement and size (2004-2007)

Size of the settlement	**No telecottage**	**Active telecottage 2004-2007**	**Inactive telecottage, 2007**	**New telecottage 2004-2007**	**TOTAL**
less than 1000 inhabitants	1453	131	93	38	1715
1001-3000 inhabitants	793	66	59	17	935
3001-10000 inhabitants	281	32	21	7	341
more than 10001 inhabitants	114	8	13	8	143
TOTAL	2641	237	186	70	3134

Source: own creation

We also conducted analyses with multiple variables to closely observe the effect of certain demographics, social and economic factors, filtering out their interdependence. One of the applied methods was discriminance analysis, where the dependent variable was "involvement" based on the two groups of the model. Out of 47 input variables the method found 5 whose effect remained significant even after filtering out the interdependence. These variables were the followings: aging index; rate of unemployment in active population; rate of children under 18; rate of permanently unemployed people among the unemployed and the rate of operating non-profit organizations. The characteristics of demographic structure, the presence of unemployment and the strength of civil society are the best indicators of evolution the involvement. The following table shows the role of these variables.

Table 2. Relations between standardized canonical discriminance function of involvementof settlements in establishing telecottages and the variables (2007)

Variables effecting involvement of settlements	**Coefficient of discriminance function**
aging index	,774
rate of unemployment	,475
rate of children under 18	,477
rate of permanently unemployed people	-,444
rate of operating non-profit organizations[6]	-,501
Significance level of the function	,000
Value of the function - involved settlements	-,296
Value of the function - not involved settlements	,061

Source: own calculation

The classification function also worked well, 84% of instances were classified correctly, belonging to the original group.

The results of discriminance analysis demonstrates that involvement proved to be significant in those settlements, where the rate of unemployment is lower, the aging index is more favourable and the presence of non-profit organizations is typical. In other words these settlements are in a more favourable situation, and those, where the rate of unemployment is high, the rate of non-profit organizations is low, the rate of children under 18 is also high, but the aging is typical as well, are less likely to become involved. Although the value of aging index is over 100% in both groups, but it is averagely 134% in settlements with telecottages, and 147% in settlements that are not involved. So we can claim with high probability that underprivileged settlements are small settlements even respecting telecottages. This is also confirmed by the evolution of the settlement size variable (population) in the logistic regression analysis, where correlation is quite obvious.

[6] Community Information Centres

Table 3. Beta results of logistic regression of telecottage involvement by settlement size
(2007)

Type of settlement	**Beta value**	**Significance level**
less than 1000 inhabitants	,-1.413	P=0,000
1001-3000 inhabitants	-,883	P=0,003
3001-10000 inhabitants	-,480	P=0,086
more than 10001 inhabitants	,107	P=0,694

Source: own calculation

As we can see, among settlements with less than 3000 inhabitants it is much less likely that we find such a settlement where there was or is a telecottage. Most socially and economically underprivileged small settlements lack the institution of telecottages, they have no direct experience with it, but they would be those that really need it.

Based on the available data we have also classified the "involvement" in another way. According to our database there are 2387 settlements that have never had a telecottage. There are 66 settlements that established telecottage between 2004 and 2007. There are 183 settlements where the telecottage was inactive between 2004 and 2007, and there are 240 settlements, where the telecottage was active between 2004 and 2007. We have also conducted the discriminance analysis for these groups with the same independent variables, like in the previous example. The 4 groups of settlements were significantly discriminated by density of population and the rate of active population. These 2 variables could estimate the adherence to certain groups quite well, since in 83.7% of cases settlements were classified into their original group. The most successful classification took place in the group where settlements haven't had a telecottage so far. In there the rate was 99.3%.

In this analysis we have identified 2 functions, and the following table shows that the new telecottages have the strongest positive correlation with the first dimension, and the second dimension has the same characteristic but with negative sign.

Table 4. Relations between standardized canonical discriminance functions of involvement of settlements in establishing telecottages by population categories and the variables (2007)

	Identifying canonical functions	
Involvement	**High density of population and lower rate of active population**	**Low density of population and moderate rate of active population**
no telecottage	,-0.03985	,-0.01823
active telecottage between 2004 and 2007	,0.08316	,0.105
inactive telecottage in 2007	,0.153	,0.164
new telecottage between 2004 and 2007	,0.714	,-0.179
The relation between the variables and the function (function coefficients) and the significance level of the relation		
rate of inhabitants between 18 and 59	,308 /0,000	,999 /0,000
density of population	,866 /0,000	-,586 /0,000

Source: own calculation

These results also confirm what we have claimed so far. The location of telecottages by type of settlements does not favour the underprivileged ones. If we want to explore the reasons, of course, further analyses would be needed, namely in quite sensitive fields. Anyhow we can see that the old sociological proverb is proven to be true: “Who he is poor is the poorest.”

4. Summary

The international literature – after a short period of enthusiasm – represents a more realistic way in observing the role and possibilities of information technology for diminishing the digital divide or digital disparities. There are several tendencies indicating that these disparities are still very significant, and there are data supporting the fact that this divide is deepening. Besides several other efforts the telecottage movement came to stay in many regions of the world, but as long as it is

treated as simple technical issue, it cannot develop its influence. From Canada to India the literature is united in the question that the success of telecottages depends on social, or sociological if you like and sociologically understood cultural factors.

This is the situation that prevails in Hungary as well, and data shows that the level of local human and social capital plays an important role in the presence of telecottage by type of settlements. And the settlements that would principally need those benefits are probably sidelined. This is due to, on the one hand, the fact that they have a lower level of human resource and social capital, and, on the other hand, the wrong approach of the relevant sector policy. Based on the analyses and results it is quite probable that geographical characteristics of digital disparity will sustain, moreover, the digital divide – along certain dimensions – could widen further in Hungary, too. Supporting telecottages and the digital technology is, of course, just one aspect of developing the underprivileged regions. We have to provide a much more space for long term ideas among the measures of rural development.

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