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Environmental injustices in border regions – case study of water quality and inland excess water

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Abstract

Environmental injustices are newly researched topics in the post socialist countries. The term refers to a situation where environment-related occasions or processes - such as floods or contaminated water - affect mainly deprived people. These injustices evolve ex ante and ex post as well. Revealing evidences of territorial distribution, understanding processes leading to unjust and recognition of the situation by the concerned population is crucial to solve problems.

Since environmental harms cannot be stopped on borders, eliminating them needs cross border cooperation. By the new Territorial Agenda and Horizont 2020 Programs the European Union takes the stress on cooperation, participative planning and social inclusion which is highly recommended in reaching environmental justice as well.

The issue of water quality has always been a priority for developed countries. Fresh and clean water is an initial human right which is strictly regulated in the EU since the Council Directive 98/83/EC entered into force. The accession of the post socialist countries to the EU started fast legal harmonization process in these countries, despite in several settlement water quality standards has not been fulfilled yet. The lack of financial possibilities of local authorities people are supplied with contaminated water. In Hungary, Békés County there are still more than 25% of the settlements and 10% of the population is affected with this problem. As a solution Hungary imports drinking water from Romania. In this paper we examine the water quality changes due to legal harmonisation process and analyse the current situation through statistical data.

There is a lack of healthy drinking water in one hand, but on the other hand there is a surplus in forms of inland excess water. The case of inland excess water is a severe problem of the Great Plain of the Carpathian Basin. It is not only risking agricultural production, but also affects urban built up areas causing health risk. The global climate change results increasing periods of droughts and excess water. The problem is not unique in Hungary, still the solution should be found on regional level between the affected countries. In the paper we examine attitude and opinion of the people who are affected by excess water. One of the main conclusions is that the most of the replicates are not aware of the problem, the perception and the adaptation strategy is different in rural and urban areas.

Keywords: environmental justices, health, CBC, post-socialist, EU legislation, water framework directive, urban-rural divide

Introduction

In the last decades several global changes and challenges went through in terms of environment and the human-environment relations, like climate change, financial crises, pandemics and so on. This requires decision makers to understand these processes to provide tools and solutions (Langhelle, O. 1999, Schimel, D. et al. 2015). Since the Brundtland Report was published in 1987 (WCED, 1987) a new era started in the academic life and politics as well. New thinking highlighted the constantly changing environmental processes and the role of human decisions in the creation of unfair and unequal situations in the environment and the multiple challenges of this new global order (Sneddon, C. et al. 2006) This relation between environment and society creates and produces its own space, which is the print of the recent legal regulation, political power, interactions and attitudes. There is a need to be aware of the negative impacts of what human activity can put on the environment since in the last decades' economic development weakened environmental focus and regulations (Conca, K. 2000). Thus the Brundtland Report focused on the global changes of our environment it also established the idea of intergenerational responsibility. International green movements started fed from the report and environmentalism became more and more in mainstream (Newton, D. E. 2009). By the time the widening human rights all over the developed world called alive grass root movements for equality and freedom of people, groups or races but not only in regulations or administration, but also in environmental circumstances as well. In the USA the Environmental Justice (EJ) movement evolved from grass root movements in order to reach equality in terms of environmental quality, in the EU it was adapted as "a response to the Aarhus Convention" (Walker, G. 2006, Mitchel, G. – Norman, P. 2012). Both aspects agree that EJ can be a tool for reach sustainability (Okereke, C. 2006). Moreover it is important to adapt the principles of fair treatment inter- and intra-generations (Rawls, J. 1971) and applying fair justice concept in everyday life, whereas equity is available for everyone and people collectively accept the norms of cooperation (Sachs, W. 2008).

In the United States sever environmental problems called the attention on issues which are affected mainly minority groups, people with color or deprived (Bullard, R. D. 1990, Dreiler, P. 1992, Eitzen D. S. – Zinn, M. B. 1994). Nowadays however the traditional environmental injustices of unequal geographical distribution of contaminations are still existing, new directions of environmental injustices are taken into notice in connection with global climate change (Bowen, W. 2002, Walker, G. 2012), economic and political decisions and also in the legislature (Cutter, S. L. 1995, Williams, R. W. 1999).

The issue of global climate change is complex, but undoubtedly connected to the society. It is directly and indirectly affects everyday life and thus it is a global phenomenon local manifestation can be various which influence differently the diverse social groups (Kurz, H. E. 2003, Agyeman J. 2005)

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The same

degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work (EPA).

In case the above mentioned criteria are not fulfilled environmental injustices occurs. The lack of environmental justice can observed from different aspects. It has several approaches according to the political, economic and social circumstances. The early researches mainly focused on the geographical distance, as it has been mentioned earlier, but in our research we take into account three different approaches (Bullard, R. D 1990, Newton, D. E. 2009). The first is the socio-cultural setting. People practice their everyday routine according to a so called technical rationality. It means that people choose the most valuable, the best, and the most rational solutions to a problem according to their knowledge. In several cases the lack of information and deficit in knowledge causes the wrong or the not proper elimination of injustices (Van Dijk, J. 2005). Sometimes knowledge is power and power can be practices by the privileged group of people, so deprived people are lack of decision and conflicts of interest can evolve (Dimaggio, P.–Hargittai E. 2001).

To measure the capability to knowledge transfer and information adaptation we created a complex-index which adapts four key elements. Motivation, material preconditions, knowledge and usage access. As a result we created the information adaptation index of Hungary. According to the results the urbanized areas are the most capable to adapt information which can mean they are the most flexible to accommodate to the changes in their environment. An earlier research concluded the most deprived and the environmental injustice affected areas. The recent and the mentioned two studies created almost overlapping maps, therefore the lack of capability on information adaptation is mainly occurs in the injustice effected and deprived regions (Figure 1.). Namely, North-East-Hungary, Ormánság, and the South of the Balaton. The affected areas are mainly in border regions which arises the importance of cross border cooperation in this areas.

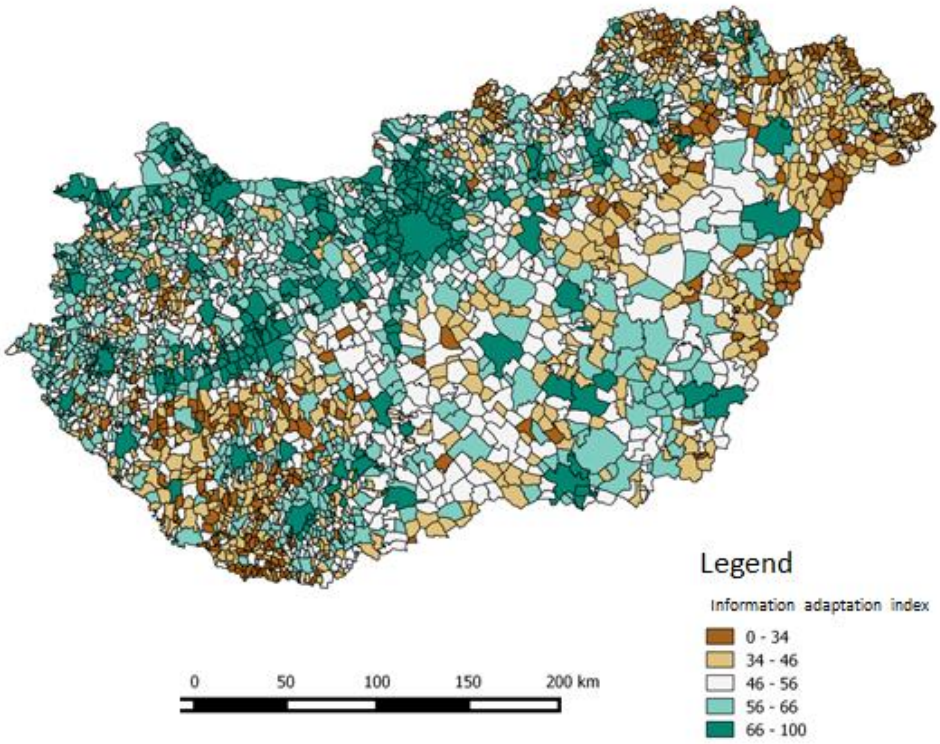

Figure 1.: Information adaptation index in Hungary according to the four key elements. Edited by the authors

The socio-cultural circumstance also influenced by cultural features. Rationality in several cases is overwritten by cultural habits and customs, therefore when injustices should be treated by governments, administrative units socio-cultural settings should be mapped. The decisions should be founded by the support of the people and made by the agreement of the affected population.

Injustices in the environment are multiscale (Harris, L. et al 2000, Kurz, H. E. 2002, 2003). Regional or local processes can affect a whole river catchment area, like the cyanide contamination of the Tisa in 2000 of the Raab contamination in 2007. In most of the cases global issues, for example global warming have its influence on the locality. Therefore global and local cannot be divided, influences might affect over scale. But scale is not the only factor which influences environmental injustices, which can be considered as multi-spatial features.

According to Harvey's idea of space production (Harvey, D 1996) there should be at least three different spaces involved in environmental injustice researches which are taking part in the evolution of the whole process. In the one hand the individual spaces produces by the stocks and the flows of people, capital, economy, services, and infrastructure. This creates a local, unique and specific setting. As it was earlier referred cultural and political attitudes also influence the production of space, so there should be researched space for the institutions on the other hand.

By this three major factor different forms and constructions of injustices can be divided which cannot be generalized even though there can be similarities in the injustices. The pluralized term of environmental injustice can help us understand these situations more and helps to evaluate new

and specific solutions. In this solution-searching method geographic perspective can bridge the differences in institutions or culture. There are several injustices which do not stop on the political border of a country. As a result different countries should cooperate to eliminate injustices on the geographical bases.

In our research we examined two cross-border cooperation possibilities based on environmental injustices, both are water-borne. One is the surplus water over the ground, called inland excess water, the other is the lack of quality drinking water due to arsenic contamination.

Research questions and methods

We established three major questions. The first is, what makes environmental processes unjust in the case of drinking water and inland excess water? Connecting to this question we were curious if inland excess water affects people differently in the urban areas and the rural areas, what is the role of knowledge and information adaptation? In our second question we focused on the role of regulation, if the changing legal environment has effect on the judgement of injustices or not. In our third theoretical question we asked if cross border cooperation can solve, if yes, how the mentioned problems.

To evaluate the research we made statistical analysis on information adaptation possibilities and water quality changes on the sample areas. We made content analysis on 36 articles and legal documents about the water quality improvement program in Hungary (see list in the end). We also examined the context as well. As a third step we surveyed 250 families in the border region of Szeged with designed, systematic sampling to find out if they are affected by any environmental injustices or not.

Results

Inland excess water in Szeged-Baktó and Domaszék

It is a complex task to explore the environmental injustices, because in the most cases it is important to pay attention to background processes.

As a result of the survey research it was proven, that both of the sample areas are affected with the inland excess water problem. However, there is a huge difference in the examined areas, because it has a greater impact on the rural settlement Domaszék, where 50 percent of the respondents had some kind of damage in the last few years in connection with the inland waters (Fig. 2.). In the other settlement Szeged-Baktó, the local people are not exposed to this environmental issue as much as the people of Domaszék based on the survey results, but the presence of the problem is unquestionable. In the most cases people have damage in their crops or houses, but in a small frequency health problems also occurred.

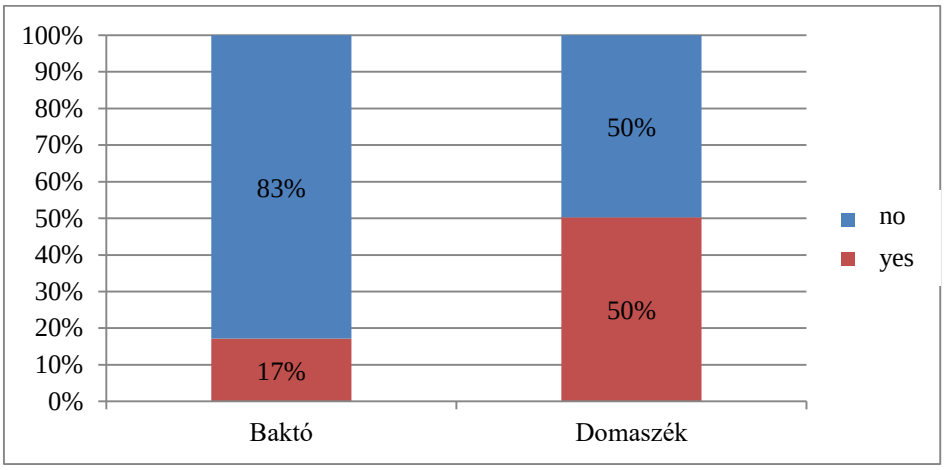

Figure 2. Inland excess water affected households in the sample areas. Source: survey results

Another question of the survey measured that the respondents like to live in their settlement or not (Fig. 3.). Whether or not impacted by the inland excess waters, the most of the local people like or really like to live in their settlement, so it can be said that this environmental problem is not so highlighted in the everyday life.

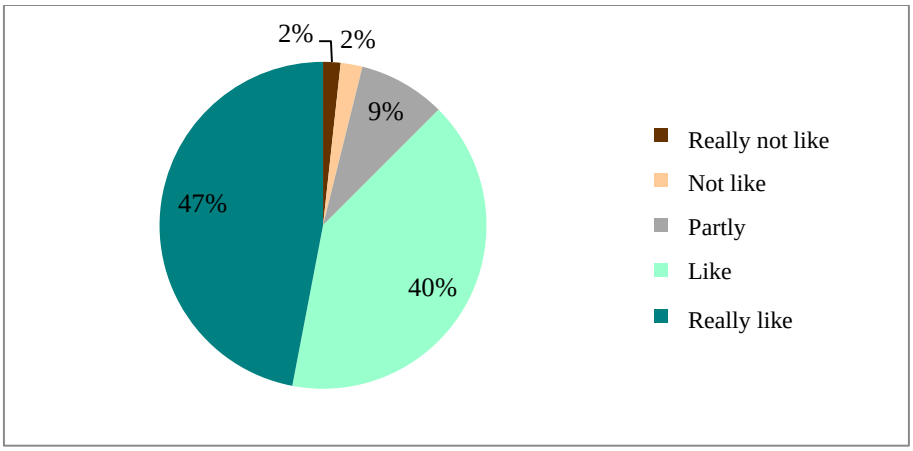

Figure 3. The given answers to the question: "Do you like to live in your settlement?" Source: survey results

The given information in connection with inland excess waters was a key element in our research, because it can have a huge role in creating and also maintaining environmental injustices. It can be stated, that the people, who are more aware of the problem, have a greater opportunity to protect themselves successfully or reduce the damage with the help of the information.

The satisfaction with the available information about inland excess waters shows a different picture in the two sample areas, because in Domaszék the local people were much more satisfied, than the people of the urban area (Fig. 4.). In contrast, most of the people, who have some kind of damage because of the excess water, didn't get any help from state or from the local administration. There were only 3 cases, when the harmed received financial help, but they also

were not completely satisfied. This result shows that in this aspect there is a lack of information in the sample areas, the local people do not know where they can get compensation.

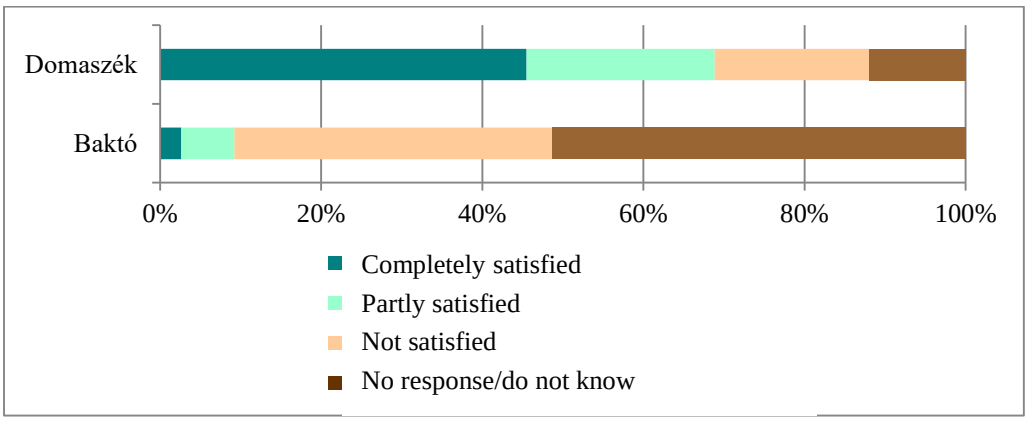

Figure 4. The satisfaction with the given information in connection with the inland excess waters. Source: survey results

The influence into the local decision-making is also an important element in the environmental injustice researches. Based on the scientific literature it can be stated, that the groups with low socio-economic status have less impact into the decision-making process and usually they are the most affected with the unjust situations.

The results of the two sample areas show, that the respondents from Baktó rate their influence worse in a larger percent as the people of Domaszék (Fig. 5.), which is the opposite outcome that we expected before the survey research. On the other hand, it can be explained with the smaller and more helpful community of the rural settlement.

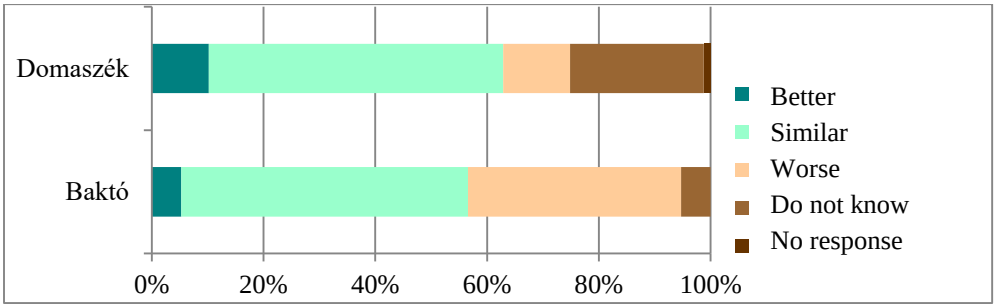

Figure 5. The given answers to the question: "According to the other local people how do you rate your influence into the local decision-making?" Source: survey results

One of the most important result of the research was that the excess water affected people think more negatively about their influence in connection with the local decision-making as the non-affected residents (Table 1.). This result can refer to the prevalence of deprivation.

According to the other local people how	Affected with the inland excess water?

do you rate your influence into the local decision-making?	yes		no	
	Baktó	Domaszék	Baktó	Domaszék
better	0%	6%	11%	10%
similar	46%	52%	48%	58%
worse	54%	35%	14%	10%
do not know	0%	6%	27%	20%
no response	0%	0%	0%	2%

Table 1. The relationship between the influence into the decision-making and the inland excess waters. Source: survey results

In conclusion it can be said, that the two sample areas have different unique features, but both of them are affected with the environmental injustices. The lack of information deepens this situation due to its special maintaining-effect, because not the limited information cause the unjust conditions, but it has an impact for the life of the local residents.

Water quality and environmental injustice in Békés County

The equal access to clean drinking water and sanitation services for all is fundamental human right, which is essential to the enforcement of the right to life and other human rights (UN 2011). The The New Delhi Statement (1990) declares in its first principle that "safe water and proper means of waste disposal are essential for environmental sustainability and better human health, and must be at the center of integrated water resources management." The Dublin Statement (1992) highlights the importance of water, but from a different viewpoint. "Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment". According to the Stockholm UN conference (1972) therefore it is vulnerable resourse it should be "safeguarded for the benefit of present and future generations through careful planning or management, as appropriate". The world is focusing mainly on the more and more sever water issues in the third world, nonetheless there are still water quality problems in the developed world.

In Hungary, the most serious health risk associated with drinking water problem is the natural arsenic concentration in drinking water, which is sometimes 10 times higher than the EU-defined threshold dose (Csanády M. 1998). Today, more than 1 million people (primarily who live in the Great Plain) are affected by the arsenic contamination. Besides the arsenic content, there is a significant nitrite, boron, fluoride ammonium content of the water. In case of decades-long ingestion and consumption of polluted water even in lower concentrations may cause noticeable symptoms, higher concentrations life-threatening causes or even death may occur (Abernathy, C.O. et al. 1999, Au, KW. – Kwong, YL. 2008, Baastrup, R. et al. 2008, Dura Gy. et al. 2008, Kirk T. K. 2001, Partridge, M. A. et al. 2007, P. Robinan, G. et al. 2014, Salnikow, K. –

Zhitkovich, A. 2008, Sathyanarayana, S. et al. 2006, Sun G. et al. 2007, Tasneem G. et al. 2009, Yoshida, T. et al. 2004, Wang, D. 2011, Zhe, Z. et al. 2008).

In order to Hungary accession to the European Union, it was essential to create alignment and harmony in variety of specialized areas of legislation. The perspective of drinking water supply meant that Hungary had to build in water directives what the European Union adopted in 1998 into its own legal system of water quality. Therefore the No. 201/2001.Government Regulation was created, which regulates, inter alia the maximum concentration of the different substances in drinking water.

Under the extent of the No. 201/2001 Government Regulation of Drinking Water and Quality Improvement Program, each municipality affected by drinking water contamination should reduce the key components within the prescribed threshold by the end of December in 2005. The municipalities in which the drinking water at least in one component exceeds the legal threshold of pollutants are entitled to participate in the Drinking Water Quality Improvement Program. The deadline has been amended and postponed three times, first in 2005, then 2009, and most recently in 2013. In spite, in 2016, the provision of safe water is still not succeeded everywhere in Hungary. This, of course, presents different regional and territorial scale values. One of the most affected Counties is Békés, where from the 75 settlements 22 settlements are still not supplied with quality drinking water complies with the recent legal regulations (National Public Health Service 2014).

Békés County is located in the south-eastern part of Hungary, which means it is neighbored with Romania. It is in peripheral geographic position, but peripheral in sense of economy and social status. Moreover it is one of the most disadvantaged counties of Hungary according to statistical indicators and complex indices (Fig. 6.).

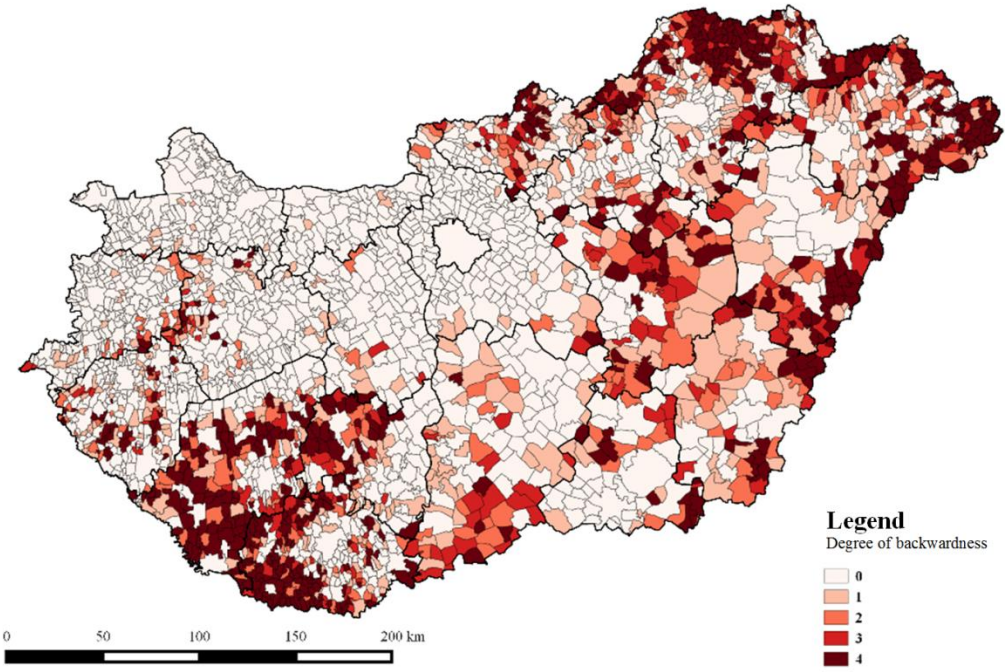

Figure 6. Disadvantaged settlements according to statistical indicators. Edited by the authors

However, the province is not only socio-economic but also environmental problems involved, one of which is the most important issue of the arsenic contaminated drinking water.

Although since the beginning of the period, when 100 percent of the settlements of the County were affected by the problem of high arsenic in drinking water, the situation has improved considerably since 1996 (Figure 7.)

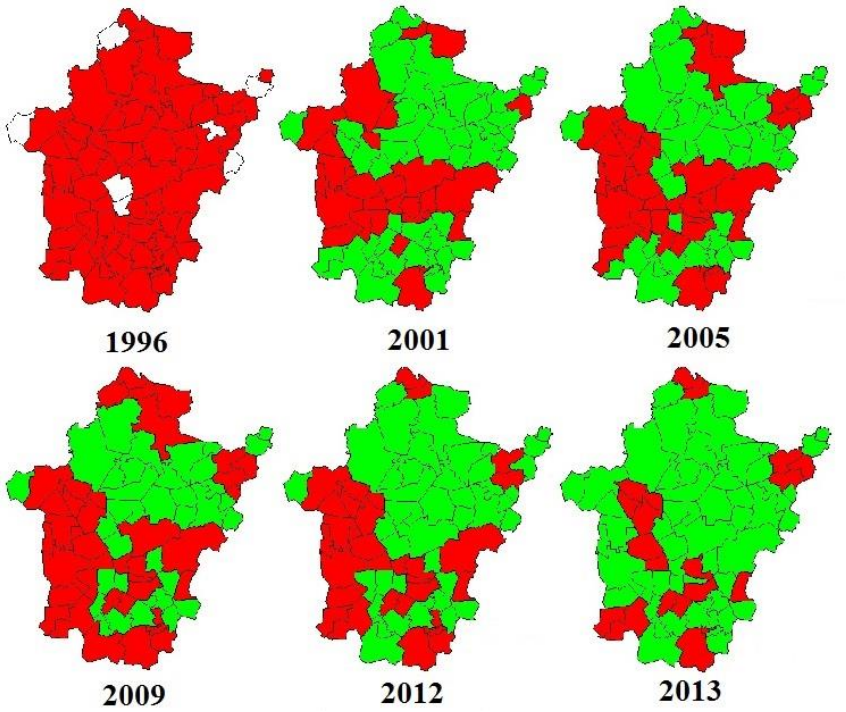

Figure 7. Arsenic concentrations above (red) and below (green) the 10 µg/l threshold value in Békés county's municipalities 1996-2013. Edited by the authors
(Source: Central Statistical Office, National Public Health Service TSTAR)

In terms of population, there is preferable change because the number and proportion of the affected people is greatly reduced after the transition (Fig. 8). Despite the positive trend still 30 thousand people consume water with high arsenic content every day. According to their socio-economic status, the affected population is worse than the average of the county. Therefore exactly those people are exposed to the dangers of consumption of arsenic-polluted drinking water who already live in the most deprived living conditions, which in turn give rise to the problem of environmental injustice detailed above (Bullard, R. D. 1990, Dreiler, P. 1992, Eitzen D. S. – Zinn, M. B. 1994,Walker, G. 2006, Newton, D. E. 2009, Walker, G. 2012)

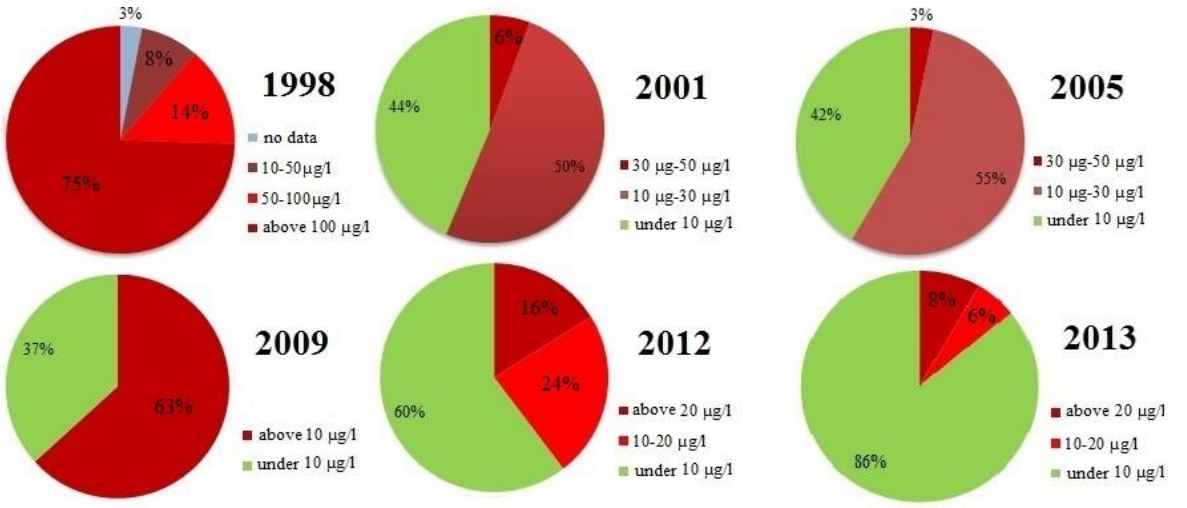

Figure 8. Arsenic contaminated drinking water, according to the proportion of the affected population. Edited by the authors (Source:. TSTAR-based Central Statistical Office and National Public Health Service's)

In order to end this unsustainable situation, the Hungarian Government and the leadership of the county came up with a plan at the beginning of the 2010s, which would be based on cooperation between the boundaries. An action plan was established with Arad County (in Romania), to construct a new pipeline system between Arad and Békés Counties which would provide drinking water what complies quality standards. With the help of the pipeline consumable water would pass through to Békés County, replacing the drinking water with high arsenic content and in the meantime reducing health risks.

It sounded a win-win deal. Although it had huge echo in the media and among the public, after five years of planning the project stopped and the proposed supply of clean water in 2013 was delayed. As a result of bureaucracy and corruption suspicious transactions the initial enthusiasm subsided, neither the media nor the responsible authorities did not issued any news about the investment since the August of 2016, when it was announced that in the summer of 2017 all Békés County settlements will be provided healthy and clean drinking water. Notwithstanding that the original date was 2011 to install the pipeline, the people of Békés County's most deprived settlements still has to consume drinking water of arsenic, boron and nitrite contamination higher than legislative threshold values.

Summary – cooperation possibilities

Applying the concept of environmental justice gives the possibility to reach an integrated and sustainable development, were not only socio-economic and political factors are decisive, but also natural factors are taken into account. The EJ can be framework for all developments, which would create a more just society, sustainable economy, cleaner healthier and more diverse environment. In our paper we highlighted water-related unjust situations, environmental injustices.

There are two major problems on water in the same time and in the same border regions. One is the surplus water of inland excess water, and the second is the lack of quality drinking water. In our two case studies we examined how environmental injustices evolve due to several factors.

Information and lack of knowledge leads to lack of action and empowerment of people in rural and urban regions affected by inland excess water. As a conclusion we can state, that information gap between certain groups of people can result unjust situation or preserve the formerly evolved injustices. In case of inland excess water the case study results proved, that providing the adequate information and knowledge empower people and urge and motivate them to action. Groups with low socio-economic status have less impact into the decision-making process and usually they are the most affected with the unjust situations. The results show, that the respondents from the urban area, Baktó rate their influence on decision-making worse as the people of the rural Domaszék. It can be explained with the smaller and more helpful community of the rural settlements.

Our second case-study shows how bureaucracy and neglect of deprived people perpetuates the unjust environmental and health situations. The lack of founding and political willingness led the poorest people of Békés County to consume contaminated water for more than a decade. The implementation of water improvement plans were delayed several times from 2001 to 2005, than 2009 and 2013. The problem seems to be solved by the summer of 2017.

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