

## DRINKING WATER SUPPLY AND CONSUMPTION TERRITORIAL DISPARITIES IN THE TIMIȘ PLAIN

**Bianca MITRICĂ\***

Romanian Academy, Institute of Geography, D. Racoviță Street, 12, Bucharest, Romania,  
e-mail: [biancadumitrescu78@yahoo.com](mailto:biancadumitrescu78@yahoo.com)

**Irena MOCANU**

Romanian Academy, Institute of Geography, D. Racoviță Street, 12, Bucharest, Romania,  
e-mail: [mocanitai@yahoo.com](mailto:mocanitai@yahoo.com)

**Abstract:** The aim of the paper is to analyse the territorial disparities of the drinking water infrastructure in the Timiș Plain. The article intends to highlight the data-base on NUTS V level (TEMPO Online time series, National Institute of Statistics) and to map the main changes registered by the statistical indicators used for the analysis: the number of territorial-administrative units (ATU) connected to the drinking water network, the length of the drinking water infrastructure, the capacity of installations to produce drinking water, the consumption of water by the different types of consumers). In Timiș Plain, the access to running water hasn't registered important regional disparities, the expansion of the rural settlements connected to drinking water network being generalized in territory. The capacity of installations to produce drinking water had decreased, especially because of the drop of the installation situated in Timișoara Municipality, and in the other small towns, this trend being linked with the decrease (with 45%) of the quantity of drinking water distributed to consumers, especially to the economic agents.

**Keywords:** territorial features, the drinking water infrastructure, Timiș Plain.

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### INTRODUCTION

Water supply is a major indicator of the level of civilization in an area, and of development opportunities for the respective human communities.

The issue of water supply to population and industry calls for a wide-ranging approach capable to outline the numerous socio-cultural, demographic and economic implications of benefiting from water supply in a centralized system and the real possibility of its daily use.

Research into the quality of life and the living standard also emphasizes that water plays an important role in the daily life of the population (ENVIS Centre on Human Settlements, 2009; Eberhardt and Pegram, 2000; Chiriac et al., 2001; WQEH, 2008; CWHW, 2010; PBWQ, 2011), improving the public health protection (WQEH, 2008), reducing the child mortality (Günther, 2011) etc.

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\* Corresponding Author

In Timiș Plain, the access to running water doesn't shows great regional disparities. The proportion of settlements, short of running water is two or three times lower in the central and the western counties of Romania than in those located in south-western, southern and western parts of the country. The statistical returns of the last census (2002) reveal that the Timiș County partially overlapping the Timiș Plain boundaries rank in the superior half of the national hierarchy for indicators regarding: „the proportion of households without sewerage per the total number of households” (Timiș - 34%) and „the proportion of households with bath-rooms per the total number of households in the rural area” (Timiș - 25%) (ADPSRN, 2003).

### DATA SOURCES

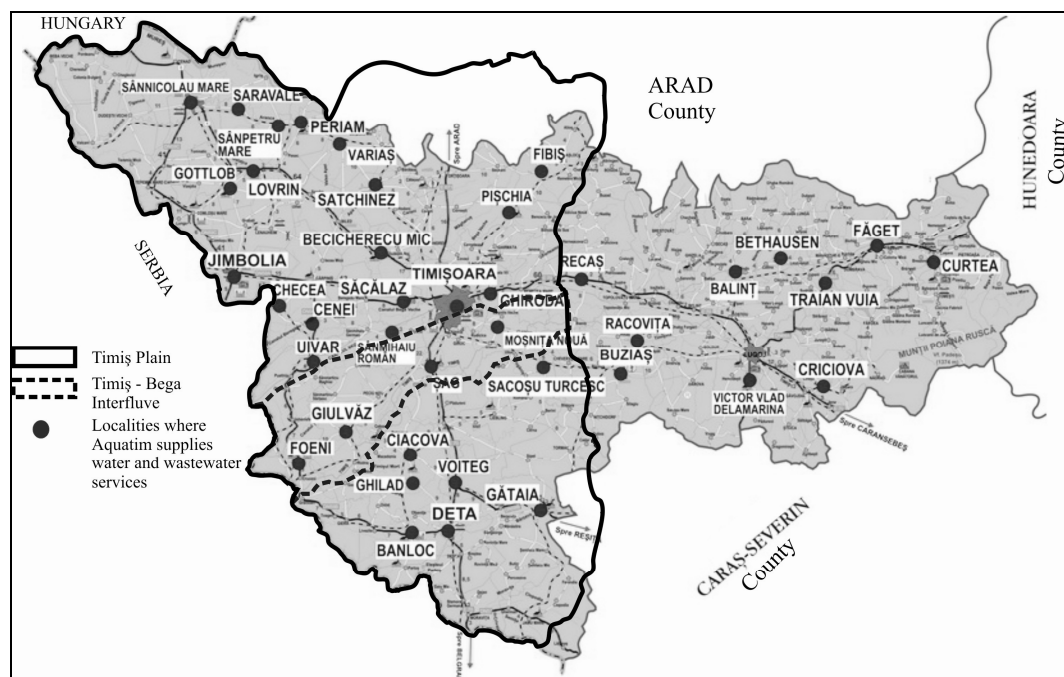
This study intends to highlight the data-base on NUTS V database (TEMPO Online time-series published by the National Institute of Statistics).

The main changes (between 2000 - 2008, with updates to 2010 whenever possible) registered by the statistical indicators and used in this analysis focus on the number of territorial-administrative units - ATUs - connected to the drinking water network, the length of the drinking water infrastructure, the capacity of drinking water production plants and water consumption by types of consumers. They are represented on a series of maps using GIS techniques.

### HISTORICAL, ECONOMIC AND SOCIO-DEMOGRAPHIC BACKGROUNDS

In 1552, the first tower for water was documentary attested in Timișoara City; during the XVIII century were attested the first mechanic installation for the water transportation from Bega river in the City (1732) and an installation for water supply (1778). In Timișoara Municipality, the first water treatment plant had started to function on June 1, 1914 (figure 1).

From 1916, the industrial water plant operates in Timișoara Municipality; after forty years a new water treatment plant has become functional, the Water Treatment Plant no. 2 capturing and treating the water from Bega River (the initial capacity was 115.7 l/s).



**Figure 1.** Territorial coverage of the Timiș Plain with Aquatim Company's services  
(Source: Aquaștiri, [http://www.aquatim.ro/uploads/file/de%20actualitate/Aquaștiri\\_iunie%202010.pdf](http://www.aquatim.ro/uploads/file/de%20actualitate/Aquaștiri_iunie%202010.pdf))

The existing water treatment plants were extended during the last two decades of the XX century: the Water Treatment Plants no. 2, extended with Water Treatment Plants no. 4 (1982), a new front capture (40 new drilling, in 1990) for the Water Treatment Plants no. 5 (1991). From the second half of the '90, the different programmes and sources for financing were used for the development of water infrastructure (1995 - Municipal Utilities Development Programme, 11.9 millions USD, 2002 - Instrument for Structural Policies for Pre-Accession (ISPA) Programme for the wastewater treatment plant rehabilitation and the upgrading of the sewerage network, 45 millions euros).

The Timiș Plain is situated in Timiș County, which constitutes a driving force for the Romanian economy, the GDP coming third after that of Bucharest and of Ilfov County, the great many small and medium-sized enterprises representing an important contributor to the area's GDP (by over 40%), due to commercial and import-export activities. In present Timișoara Municipality is a great polarizer for the industry and services sectors, concentrating 60% of all of the Timiș County industrial units.

The economic structure of the Timiș Plain is influenced by the evolutions seen in Timișoara Municipality, the city supplying 96% of the entire workforce to the 12 settlements from the plain. The total number of employees registered a sinuous evolution and beginning with the last decade, was observed a constant increase, due to the development of a viable entrepreneurial sector based mostly on small and medium-sized enterprises, and the attraction of foreign investments in particular.

The positive dynamics of the socio-economic life is due primarily to its geographical position at the cross-roads between the Carpathian realm and the Pannonian Basin. Timiș County, especially the Timiș Plain, is an area of major economic importance and a gateway to Central Europe and Balkan Europe; in addition, the Timișoara City lies in a zone of vast European convergence and penetration, featuring big transport and communication axes.

The main demographic particularities of the Timiș Plain are the followings: total population is 346,818 inhabitants, population structure: 89.8% urban population, 10.2% rural population, demographic size of the settlements is 1,429 inh. (Bucovăț) and 311,586 inh. Timișoara City and population density is 341.7 inh./sq km.

In some of the Timiș Plain communes, the decrease trend of the population had been visible even before 1989, depopulation setting in due to the rural-urban migration, despite the restrictive measures to stop this phenomenon by closing the large urban centres new incomers. Over the past 20 years, the Timiș Plain lost 13,467 inhabitants, the decrease culminating in 2002, and improving slightly between 2006 and 2009.

The historic region of Banat was even in the past (under communism) a space characterised by temporal and definitive immigration mainly for people from Moldavia and Oltenia, and after 1990 also from some parts of Arad, Hunedoara and Teleorman counties.

The main economic actor in the water supply filed is Aquatim, which represents the regional operating company of the public water and wastewater services for Timișoara Municipality and 40 other localities from Timiș County (figure 1).

### **TERRITORIAL DISTRIBUTION OF DRINKING WATER INFRASTRUCTURE**

The human settlements network connected to drinking water supply was in a continuous extension because of the connection of rural communes. In 1990, 66.6% of total administrative territorial units (ATU) of the Timiș Plain were connected to the drinking water supply and in 2009 (91.6%) (figure 2).

The length of drinking water network increased continuously in the interval 1990 - 2009, with 41.3% (with 30.5% over 2000 - 2009), being correlated with the extension of the localities network connected to drinking water supply (the most significant in Timișoara Municipality and in the rural communes of Giroc, Șag, Uivar and Bucovăț, localised in the neighborhood of the Timișoara Municipality) (figure 3).

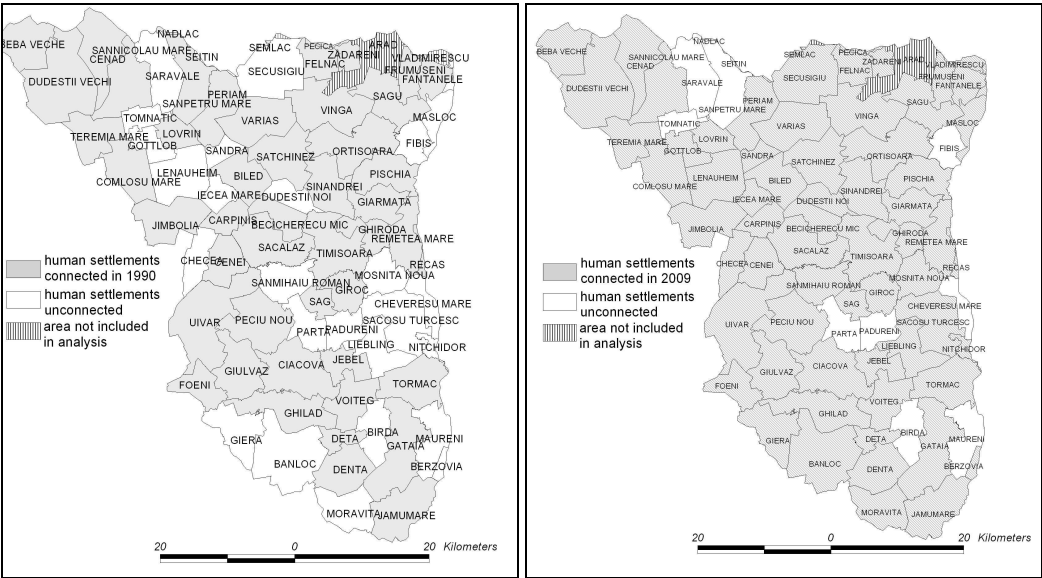


Figure 2. The ATU connected to drinking water supply (1990 and 2009)

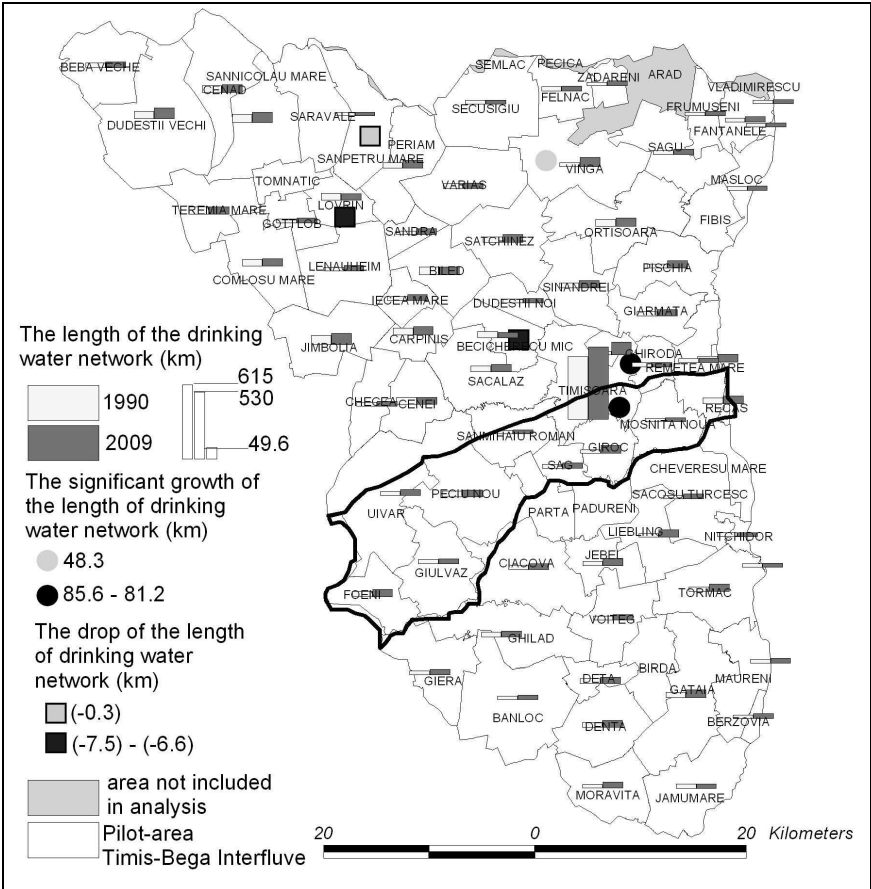
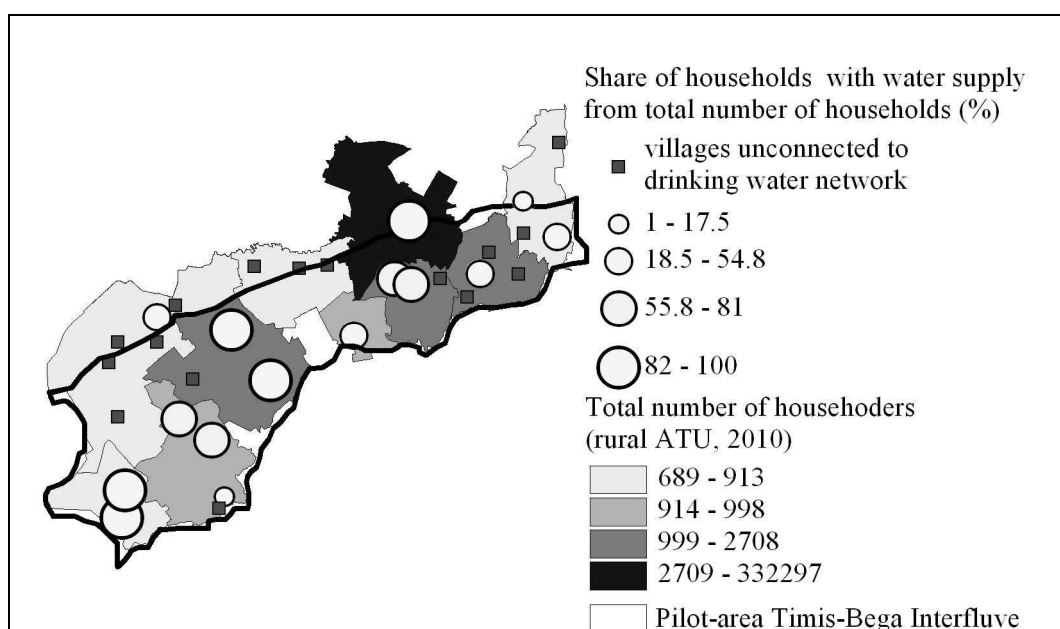


Figure 3. The length of drinking water network. Territorial characteristic

Field investigations conducted in the Timiș - Bega Interfluve pilot area revealed the situation of the settlements connected to the drinking water network shows: a good coverage with water services, yet been clearly differentiated between rural and urban ATU in terms of length of drinking water network, share of households with water supply, quantity of water distributed to the consumers. In the pilot-area Timiș-Bega Intefluve, the total length of drinking water network is 836.6 km (2010), 73.9% being concentrated in Timișoara Municipality.

The territorial disparities between the villages from the pilot-area Timiș-Bega Intefluve outlines the greater length of drinking water network in the rural settlements in the neighborhoods of Timișoara Municipality (the case of Giroc and Chișoda villages, which have the water network connected with the network of Timișoara Municipality) that in the villages localized at the periphery of the Timiș County. In the pilot-area Timiș-Bega Intefluve, in 2010, the total number of householders is 343,826, and 98.07% from these are connected to the drinking water network (100% in urban area and 46.4% in rural area) (figure 4).



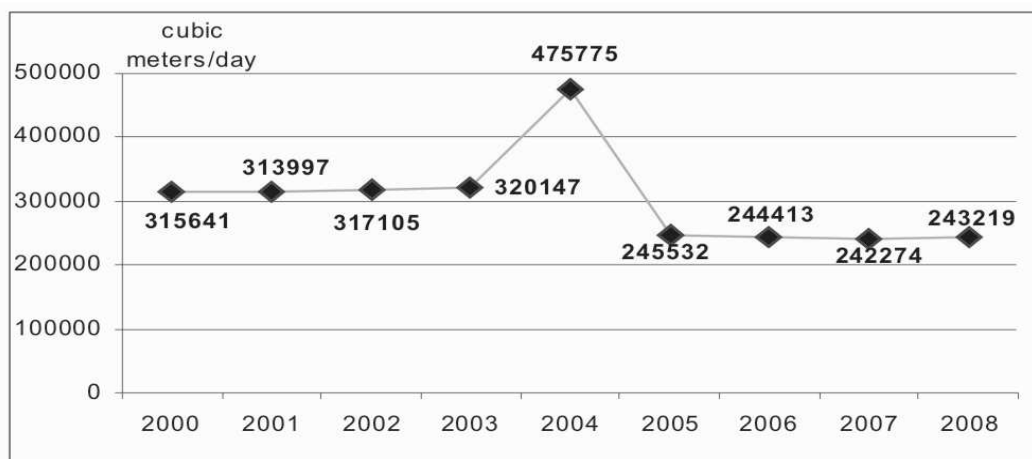
**Figure 4.** The households connected to the drinking water network

In February, 2011, the financing of the project „*Extension and modernization of water supply and sanitation in Timiș County*“ was signed. The project has a value of 118.87 million euros and it is financed from the Cohesion Fund, by Sectoral Operational Programme Environment.

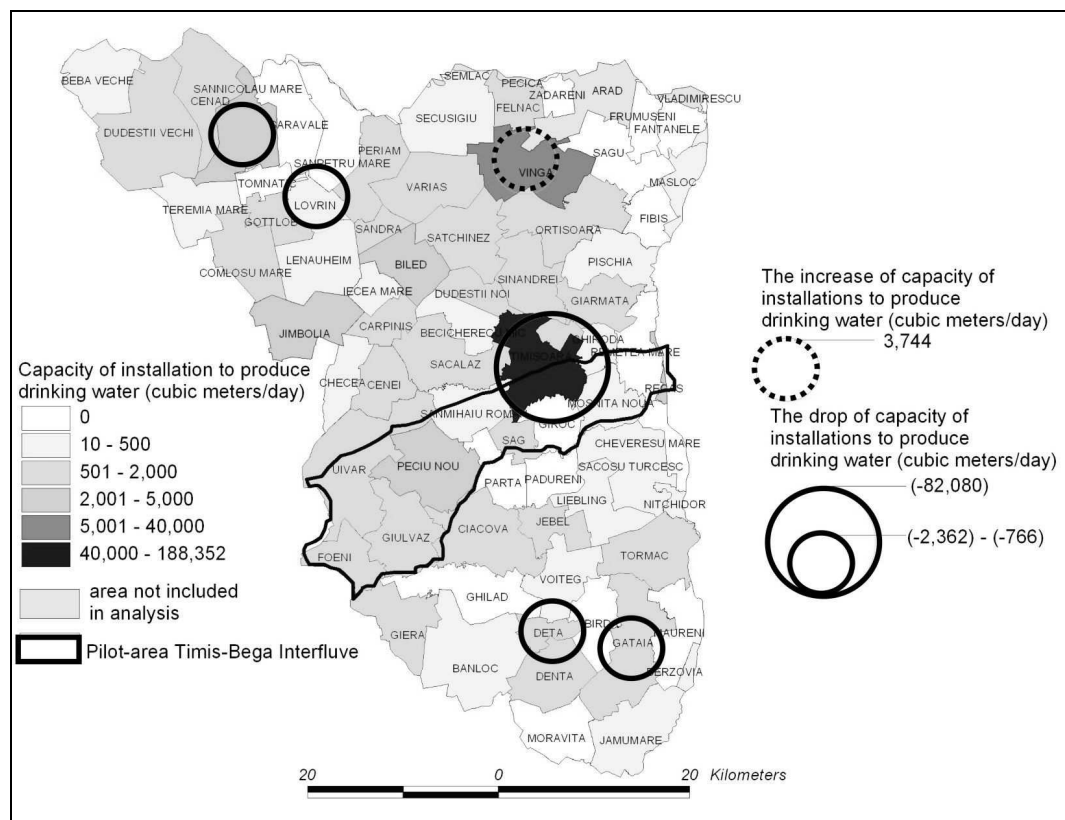
#### QUANTITATIVE ASPECTS CONCERNING THE PRODUCTION AND THE CONSUMPTION OF DRINKING WATER

The capacity of installations to produce drinking water had decreased with 22.9%. The decrease was caused by the drop of capacity to produce drinking water specific for the installations situated in Timișoara Municipality, Deta, Sânnicolau Mare and Lovrin (figures 5, 6).

In Timișoara Municipality, in 2008, Aquatim SA supplied an average of 2.63 million liter/hour (Raport anual Aquatim (RAQ), 2008). The city relies mostly on river water supplied by the Bega treatment plant, but also on groundwater supplied from 56 water drills by the Urseni and Ronat treatment plants. The river water/groundwater ratio has been maintained constant in the last years to protect the natural, resources (RAQ, 2008).



**Figure 5.** Dynamic of installations capacity to produce drinking water

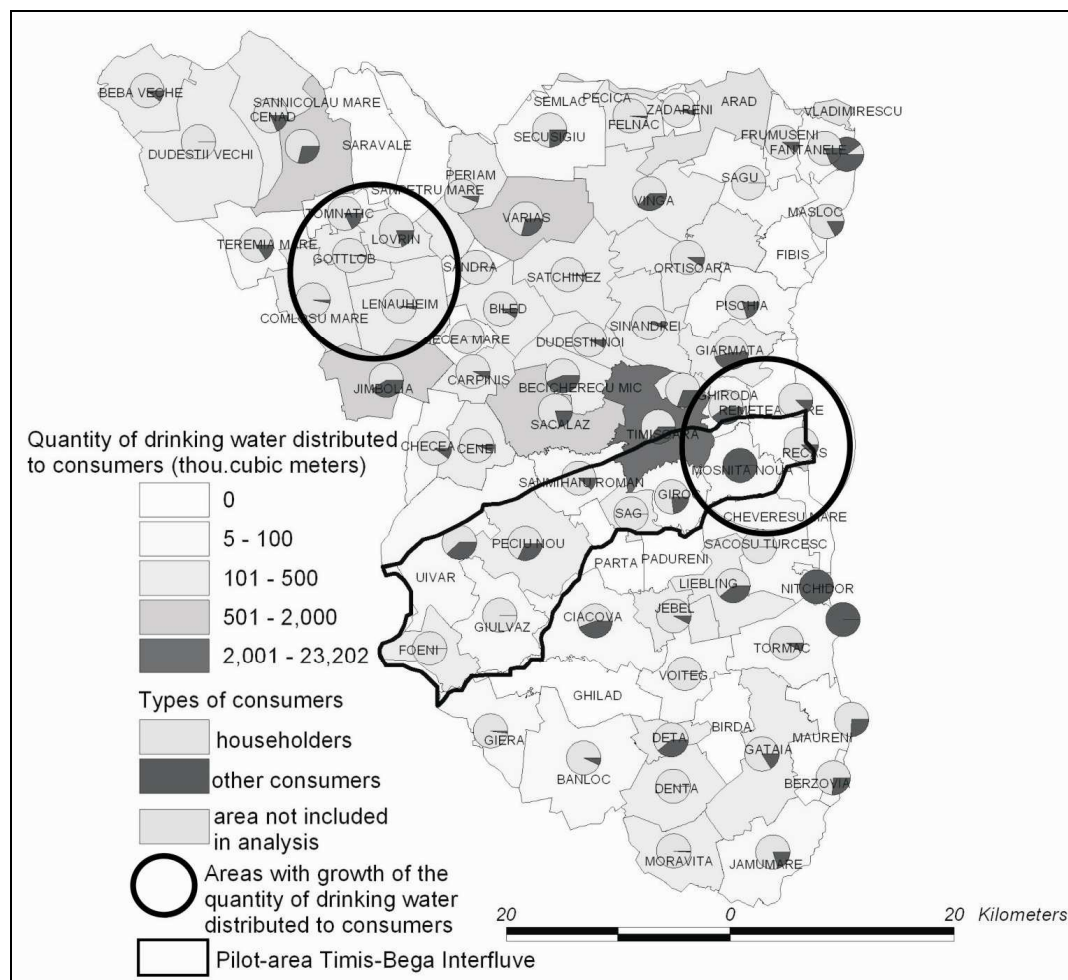


**Figure 6.** The capacity of installations to produce drinking water. Territorial disparities (2009)

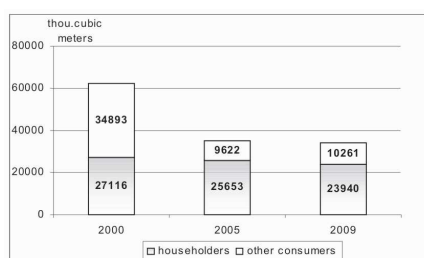
In terms of territorial differentiation, the major changes in response time consist in the increasing of the quantity of drinking water distributed to consumers in 2 different areas:

- in the western part (Lenauheim, Tomnatic, Gottlab, Comoloșu Mare, Lovrin);
- in the eastern part of Timișoara Municipality (figure 7).

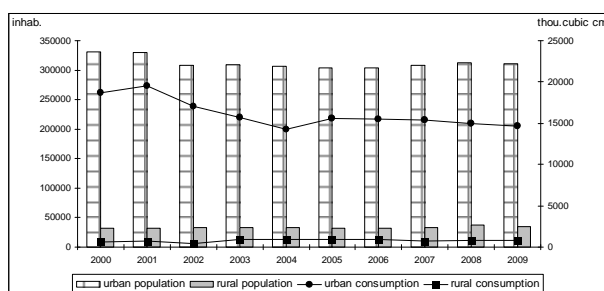
The quantity of drinking water distributed to all consumers decreased by 56.4% (between 2000 and 2009). The two types of consumers shows the same negative dynamic, household consumption dropping by only 19.8%, compared to 77.3% in the case of the other consumers (figure 8).



**Figure 7.** The quantity of drinking water distributed to consumers by types of consumers (2009)



**Figure 8.** The quantity of drinking water distributed to consumers by type of consumers



**Figure 9.** The consumption of drinking water of the urban and rural population

The quantity of drinking water supplied to population fell over the 2000 - 2009 period (figure 9) because of population decrease, the implementation of water measurement system and the increase of drinking water costs. Between 2020 - 2100 the quantity of drinking water supplied to the population is expected to increase in the county-side due to improvements in the drinking water supply length (11.0% in 2050 and 11.6% in 2100) and in town due to increase of population (15% in 2050 and 20% in 2100).

### GENERAL ANALYSIS OF THE WATER PRICE

Between 2000 and 2009, the cost of water rose by 5.8 times, from 0.42 to 2.46 lei (Raport anual Aquatim (RAQ), 2008). Water consumption and cost increases over the studied period were closely correlating (figure 10).

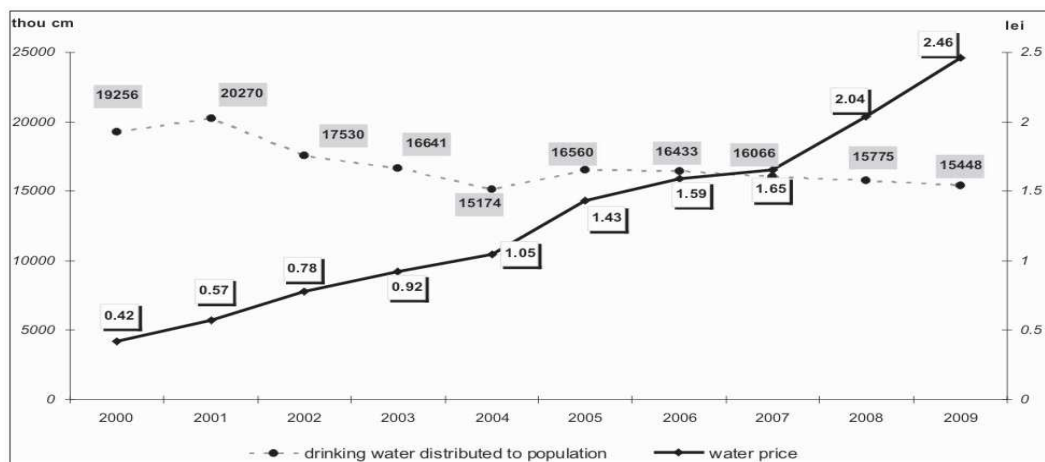


Figure 10. The quantity of drinking water distributed to population and water costs

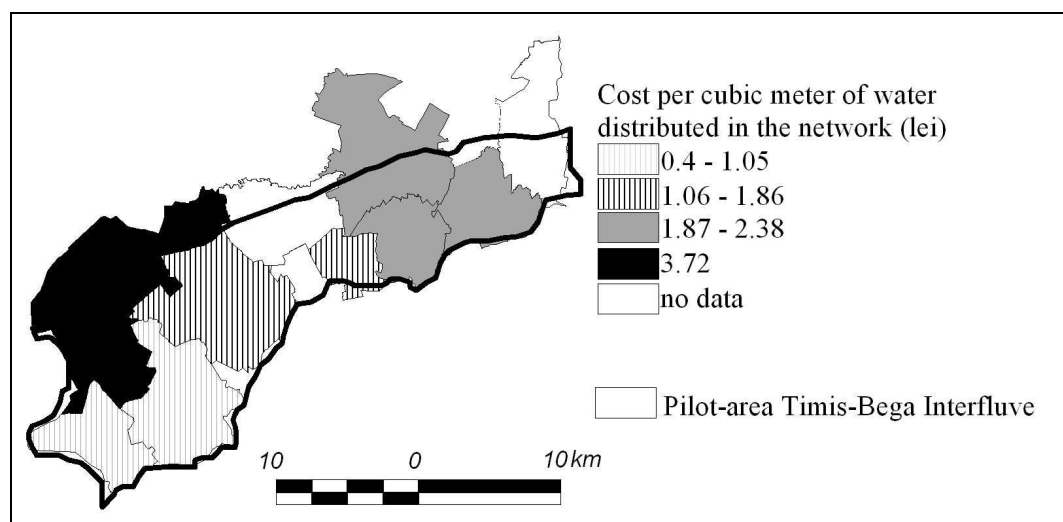


Figure 11. Cost of water distributed (2010)

The cost of water distributed in the territory varied significantly from one locality to another, prices staying high in Uivar, Timișoara, Giroc and Moșnița Nouă with lowest values at Becicherecu Mic and Giulvăz, settlements situated in the south-west of the Timiș Plain (figure 11).



## CONCLUSIONS

In Timiș Plain, the access to running water doesn't shows important regional disparities. The expansion of the human settlements network connected to drinking water supply is accompanied by the decrease of the capacity of installations to produce drinking water (with 23.4%, especially because of the drop of the installation situated in Timișoara Municipality, Deta, Sânnicolau Mare and Lovrin) and of the quantity of drinking water distributed to consumers (with 45%, the two types of consumers having the same dynamic (negative) but the consumption of the households had drop less, compared with 70.6% specify for the other consumers.

Field investigations conducted in 2010 in the Timiș Plain pilot area, revealed a good coverage with water services: 343,826 households and 98.07% from these are connected to the drinking water network. It is obvious the differentiation between rural and urban administrative-territorial units, in terms of length of drinking water network, share of households with water supply, quantity of water distributed to the consumers.

The drinking water prices increased, in the context of the decreasing of the quantity of drinking water distributed to the population, because of the decreasing of the total number of population.

The present study underlines the weaknesses in systems of water supply in Timiș Plain: the insufficient water supply networks territorial expansion in the rural area, the low level water metering to customers, the high level of losses due to wear of the systems, the degree of metering an low cost coverage by tariffs, the rural environment does not benefits the wastewater collection system and the wastewaters are discharged unpurified or poorly treated.

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