THE CURRENT STATE AND FORECAST OF UTILITIES IN THE WESTERN REGION OF ROMANIA

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Abstract. *The work carries out a study on the current situation of utilities (mainly tap water and sewage) in rural towns in the western region of Romania. If urban localities have all these utilities, in rural areas, the situation differs from one county to another. Based on the existing data and the growth of the last 15 years, we made a forecast to see how long it will take the entire rural area to reach the level of urban endowment, respectively 100%. According to the processed data, Timis and Caraş-Severin counties are the first, followed by Hunedoara and Arad, in the last case, over 13 (for water distribution network), respectively 22 years (for sewage) being needed.*

Key words: *utilities, forecast, Romania, western region*

INTRODUCTION

The equipping of houses and localities with a drinking water installation represents, at this moment, a standard that which should no longer be discussed to give the attribute of a locality or housing as having civilized living conditions. Also, localities and homes equipped with water supply systems, by default, must have centralized or local wastewater discharge systems (sewage networks). At the level of the country, not all of the houses provided with water supply installations also have wastewater discharge networks. This situation leads us to the conclusion that the wastewater is discharged on the surface of the land or in drainage channels (ditches), a fact that denotes a precarious state of hygiene in households and localities [2].

A lack of basic sanitary facilities, and here we mainly refer to flushing toilet, is a measure of poor-quality housing and is also considered a health risk [10]. More than one in four people in Romania reported in 2019 that their household did not have an indoor flushing toilet (27.7%). This was by far the highest share amongst the EU Member States. In contrast, the share of dwellings with no flushing toilet was below 1% in 19 EU Member States, with the lowest shares in Germany, Luxembourg, the Netherlands and Sweden (close to 0%) [13,15].

The West Region is composed of the following four counties: Arad, Timis, Caraş-Severin and Hunedoara, totaling 32,034 km2 and representing 13.4% of Romania's surface and a population of 1,916,907 inhabitants. Timis County is, in terms of extent, the largest in the country (3.6%). In the region there are 10 municipalities, 27 cities, 266 communes and 1334 villages [3].

Generally, Romania has been working on modernizing its utility infrastructure, including improvements in electricity generation and distribution, water supply, and sewage systems. However, there are still challenges in some areas, such as aging infrastructure, occasional service disruptions, or uneven access to utilities in rural areas.

The connection priorities of the localities must be calculated regarding the average cost of connection per household, as well as the budgetary capacity of the locality, and here we refer to the funds of the municipality and/or to the residents, to support financially the connection project [1].

This year, the Ministry of the Environment, Water and Forests sent, for publication, to the Official Gazette, the funding guide for the Program aimed at water supply, sewage and wastewater treatment systems. It has a budget of 1.5 billion lei and finances projects aimed at the protection of water resources, water supply systems, sewage and domestic wastewater treatment. Funding session will start 30 days after publication. Financing is granted in a maximum percentage of 100% of the eligible expenses, within the limits of the amounts that can be granted for each category of applicants [16]. Taking into account the relatively low access to such programs, it will be interesting to see in the future, how many municipalities will access these funds and especially, how many projects will be completed.

In the study, natural gas supply was not taken into account (all the cities in the studied area have such networks [5]), considering that water supply and sewerage are the most important to reveal the degree of development of the communes.

MATERIALS AND METHODS

The research carried out is based on statistical data taken from Eurostat and from the website of the National Institute of Statistics, as well as from other bibliographic sources. Based on the collected data, the annual growth averages were determined, which allowed making forecasts for each collected set (indoor flushing toilet, indoor bath or shower water distribution network and public sewage).

RESEARCH RESULTS

From the analyzed statistical data, comparing the values from several neighboring countries (Bulgaria, Hungary and Serbia), respectively two with a high level of development (Germany and France), it turns out that, referring to flushing toilet, Romania is on the last place (figure 1). If in Hungary and Serbia, the values decreased from approximately 5% (in 2012) to approximately 3% (in 2020), in Romania, they decreased (a lot is true) from almost 37% (in 2012), to almost 23% (in 2020). Even Bulgaria stays better than us, with a percentage of almost 13% in 2020, having 22.5% in 2012.

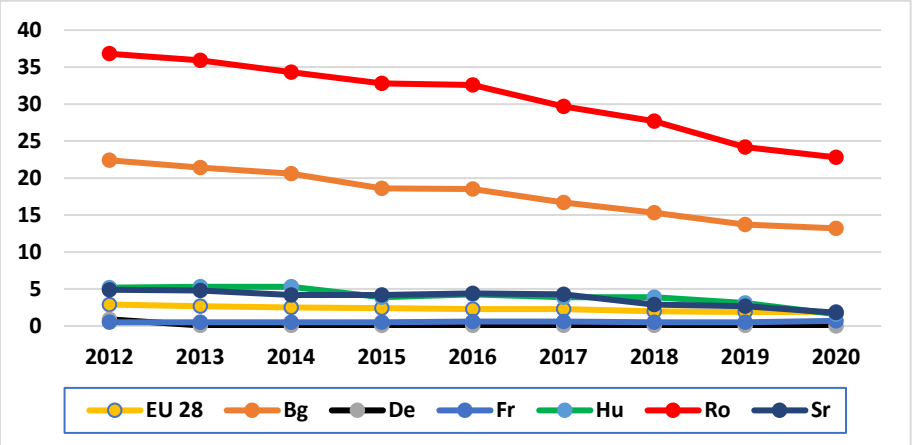

Figure 1. Total population not having indoor flushing toilet for the sole use of their household, 2012-2020, %

Source: own calculation after [6,7]

The situation is roughly similar, if we compare the same countries, but taking into account a more complex situation, that is, households that do not have a bathroom, shower or toilet in the house (figure 2). Here, even if it started from lower values than in the previous case, in 2020, for the most part, similar percentages are reached. For example,

Romania went from 36.6% in 2012 and reached 21.2% in 2020, and Bulgaria went from 14.5% in 2012 and reached 7% in 2020.

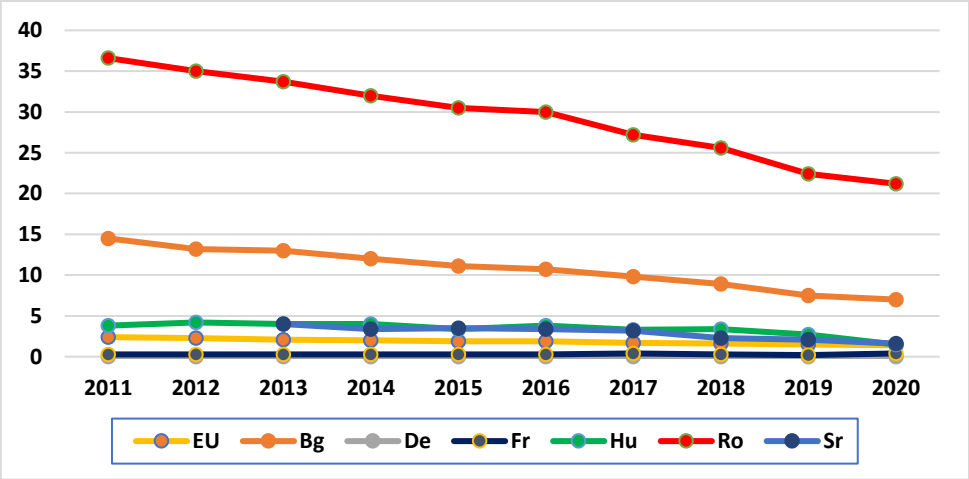

Figure 2. Population, total, having neither a bath, nor a shower, nor indoor flushing toilet in their household, 2011-2020, %

Source: own calculation after [6,8,9]

Referring only to the last year for which data was found, namely 2020, we wanted to see the same situation, but depending on the age range of the inhabitants, between 18 and 65 years (those who theoretically still work) and over 65 of years (i.e. pensioners) (figure 3). The data from the respective periods show us that, except for Hungary (where it is the opposite), in all the countries studied, the majority of people who do not benefit from a bathroom and toilet at home are over 65 years old. In Romania, it is normal to be like this (unfortunately), because people over 65 years old from rural areas, who represent approximately 43.5% of the total number of people from rural areas [14], do not have the necessary income to equip their home, often one in poor condition, with water and toilet in the house.

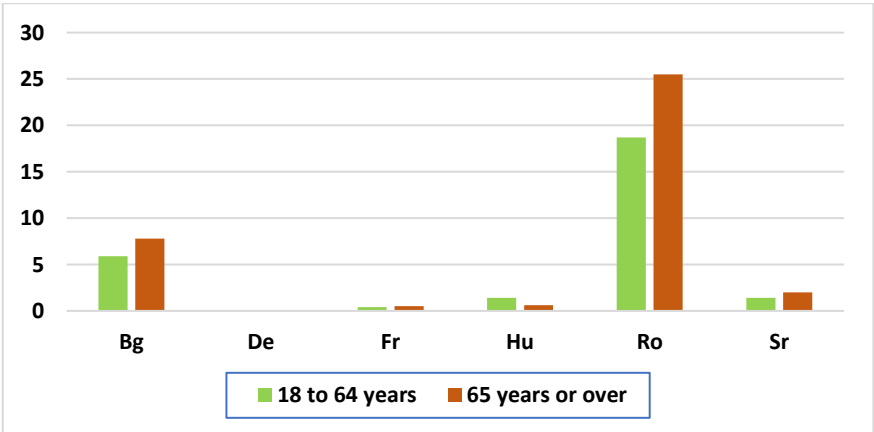

Figure 3. Population, from 18 to 64 years and 65 years or over, having neither a bath, nor a shower, nor indoor flushing toilet in their household, 2020, %

Source: own calculation after [6,8,9]

Returning to the situation in the western part of Romania, we took from the statistics the data on the number of localities with a water distribution network in each county from 2009 until 2022 and compared them year by year, in order to calculate the annual percentage increase. We also calculated the growth average for the entire period, in order to apply it to the forecast made for each county (Table 1).

Table 1.

The annual percentage increase of localities with a water distribution network in each county, 2009-2020, %

County/ Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
AR	1,8%	1,7%	0,0%	0,0%	0,0%	1,7%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	**0,4%**
CS	2,9%	5,6%	2,6%	5,1%	9,8%	24,4%	0,0%	0,0%	1,8%	0,0%	0,0%	0,0%	5,3%	1,7%	**4,2%**
HD	3,8%	0,0%	14,8%	22,6%	0,0%	0,0%	5,3%	2,5%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	**3,5%**
TM	2,8%	5,4%	2,6%	0,0%	3,8%	0,0%	0,0%	1,2%	2,4%	0,0%	1,2%	0,0%	0,0%	0,0%	**1,4%**

Source: own calculation after [4]

It turned out that Caras-Severin (CS) county has the highest average increase in the period considered, followed by Hunedoara (HD), Timis (TM) and Arad (AR). It can also be seen from the data in the graph that both Caras-Severin county and Hunedoara had a spectacular increase between 2010 and 2014, over 30% in the first case, respectively over 21% in the second case.

Taking into account where each county started in 2008 (in the previous table, the first year is 2009, and not 2008, because the first calculation is the reporting of 2009 to 2008), and applying the growth percentage determined for each (assuming that it will not decrease for various reasons), 0.4 in Arad, 4.2 in Caras-Severin, 3.5 in Hunedoara and 1.4 in Timis, the calculated data show us that Timis county, even if it did not "leave" first, will be the first to reach 100% in 2024 (figure 4). It is followed by Caras-Severin in 2025 and Hunedoara in 2030. Arad County, even if it was second in the hierarchy in 2008, if we rely on the calculated average growth, it will reach 100% only in 2046.

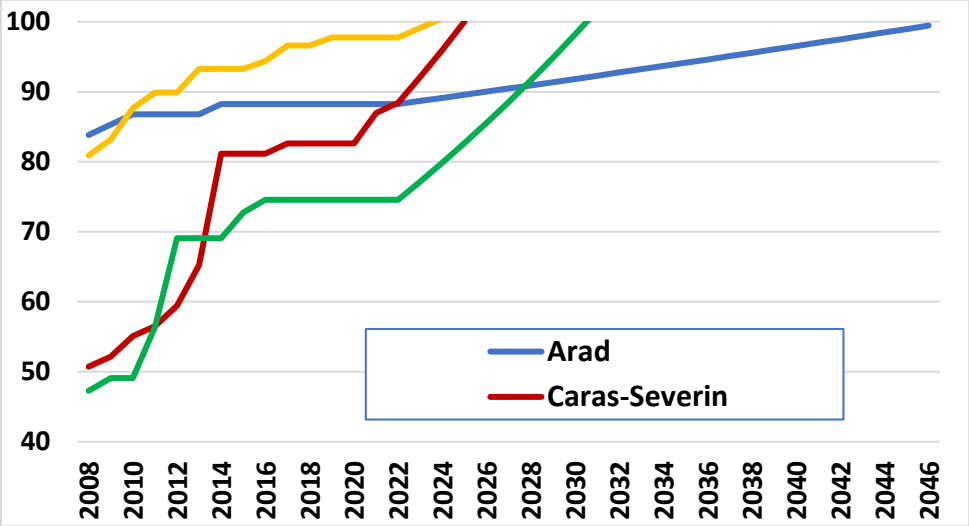

Figure 4. The number of localities with a water distribution network out of the total number of localities, %

Source: own calculation after [11]

Taking the same reasoning for sewerage, the average increases are much higher than in the previous case, namely 5% for Arad, 10% for Caras-Severin, 7% for Hunedoara and 9% for Timis (Table 2)

Table 2.

The annual percentage increase of localities with sewerage in each county, 2009-2020

County/ Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
AR	6%	0%	0%	6%	5%	25%	4%	8%	7%	0%	3%	0%	3%	3%	**5%**
CS	15%	7%	19%	5%	10%	36%	3%	0%	26%	0%	5%	0%	5%	2%	**10%**
HD	8%	15%	13%	18%	0%	0%	10%	5%	0%	0%	4%	8%	4%	11%	**7%**
TM	13%	0%	18%	5%	14%	8%	4%	15%	10%	3%	9%	11%	5%	7%	**9%**

Source: own calculation after [12]

In this case, the starting point, from 2008, was close for all four counties, the lowest percentage being in Timis, 19.1%, and the highest in Arad, 26.5%. It is interesting to note that, after applying the growth percentage, with the same specification as in the previous case, the first county to reach 100% is Caras-Severin in 2027, followed by Timis in 2030, Hunedoara in 2031 and, again, Arad in the last place, in the year 2037 (figure 5).

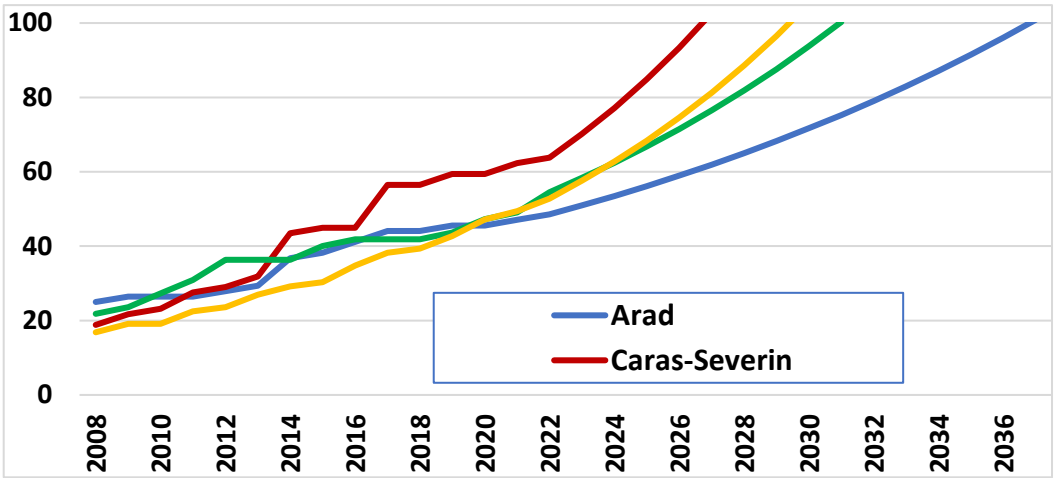

Figure 5. The number of localities with public sewage out of total localities, %

Source: own calculation after [12]

CONCLUSIONS

The results of the study clearly show us that, in Romania, at the end of 2020, approximately a quarter of the population does not have access, at home, to a water distribution network or to sewage services. This situation is considered to be an expression of poverty and at the same time a health risk.

For the counties from the western part of Romania, the growth forecasts, based on the average growth percentages from 2008-2020, show us that it is possible that in seven years, i.e. 2031, in three of the four counties (Timis, Caras-Severin and Hunedoara), all the houses from the rural areas to be connected to water and sewage. The fourth county, Arad, even if it was better than the others at the beginning of the studied period, had a much slower growth, punctuated by many stagnations, thus ending up in last place according to the forecast. For this county, the forecast shows reaching the percentage of 100% only six years after the last of the three previous ones, in the case of sewage and over 15 years in the case of water supply. In fact, the sewerage situation can expand in turn, because it is unlikely that there will be a sewerage network without an existing water network.

We are aware that an effective percentage of 100% is very difficult to achieve, if not impossible, but we would be happy if, in 2030, we reach the level of other countries in Europe, i.e. that homes without water and sewerage are located in the range of 2-7%.

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