

Water Supply and Sanitation Development as a Requirement for Sustainable Tourism Development in Romania

SIMONA MARIA FRONE

Department of Sustainable Economic Development
Institute of National Economy at the Romanian Academy
13, Calea 13 Septembrie street, sector 5, 050711, Bucharest
ROMANIA
frone.simona@gmail.com

DUMITRU FLORIN FRONE

Faculty of Management, Economic Engineering in Agriculture and Rural Development
University of Agricultural Sciences and Veterinary Medicine
59, Marasti blvd., sector 1, 011464, Bucharest
ROMANIA
ffrone@hotmail.com

Abstract: There is a complex and mutual reinforcing relationship between the development of water and waste water infrastructure in a region or country and the development of tourism. Tourism activity considerably increases the demand for local water and sanitation infrastructure utilities, putting a pressure on their sustainable use and development. On the other hand, the sustainable management and development of the local water and environment, as tourism amenity and attraction, requires a well developed system of wastewater treatment, to avoid the adverse water pollution effects (such as eutrophication of the lakes, changes in the water ecosystem, jeopardized biodiversity). Unfortunately, for the moment, Romania is still lagging behind in Europe, in the sector of water supply and sanitation, this affecting not only tourism but also local economic growth and business prospects. Therefore, every local, regional and the national strategy of sustainable economic development should integrate the policies for tourism development with those for water/wastewater infrastructure development.

Key words: water supply, sewage, wastewater treatment, environmental infrastructure, impact, tourism, rural, regional, development

1. Introduction

In Romania, after the change of political system and the transition to the market economy, in the last about twenty years, there has been an increasing awareness on the environmental and sustainable development issues, at least in academia and NGOs circles. However, the insufficiently documented benefits of water and sanitation, in conjunction with the permanent local and national shortage of financial resources have resulted in low political priority for water issues and in sub-optimal levels of investment in water infrastructure.

Investment in water supply and sanitation services typically generates many important economic, environmental and social benefits, since, as demonstrated by several studies and international research, the provided access to clean drinking water and sanitation: reduces health risks;

frees-up time for education and other productive activities; increases the productivity of the labour force.

Safe disposal of wastewaters helps to improve the quality of surface waters with benefits for the environment (e.g. functioning of ecosystems; biodiversity), as well as for economic sectors that depend on water as a resource (e.g. fishing, agriculture, tourism).

Nevertheless, in contrast with basic water supply and sanitation services, the benefits of wastewater treatment are less obvious to individuals and more difficult to assess in monetary terms. The consensus on the need for increased urban wastewater treatment as well as safe disposal of its residues has therefore developed more slowly, probably also due to the relatively high costs of such interventions [1].

The benefits from wastewater treatment are linked to an improvement in water quality and may be:

- withdrawal benefits (e.g. for municipal water supply as well as irrigated agriculture, livestock watering and industrial processes);
- in-stream benefits (benefits that arise from the water left “in the stream” such as swimming, boating, fishing), the latter being particularly important for tourism and recreational activities.

In Europe, the European Union Urban Waste Water Treatment Directive adopted in 1991 represented the policy response to the growing problem of untreated sewage disposed into the aquatic environment. In Romania, the unwanted result of the lack of proactive political concern and action in the past is the current lagging behind of the country, as we shall briefly point out below. Every opportunity should be used to further develop integrated water supply, sanitation and wastewater treatment in the areas not covered in Romania; tourism development and prospects may be such a welcome opportunity.

2. Impact and importance of tourism on water supply and sanitation

As concerning the potential impact of tourism on the local development of water supply and sanitation systems, the literature shows some important and interesting insights. Tourism causes an increased consumption of water for associated facilities and leisure and tourists require constant access to water. A tourist staying in a hotel uses water (on average) 30 per cent per day than more than a local inhabitant [2].

Therefore, tourism generally has an ‘urbanising effect’ on a destination, attracting more people to catchments and increases the environmental load on such places, resulting in short term peaks in demand of varying intensities [3].

For the sustainable use of limited water resources, people should be committed to save water and protect water quality. As an example, overexploitation of groundwater which occurs when the volume of abstracted water exceeds the average annual recharge causes a reduction in groundwater table, which negatively affects wetlands whose hydrological dynamics are directly linked to aquifers. Coastal groundwater has been reduced to below sea level by excessive pumping in Cyprus, Greece, Libya, Spain and Turkey as a result of high tourist population and high water consumption [2]. Once the salty water level has

increased, with saline water intrusion, fresh water treatment or finding a new alternative source would be required, while higher levels of salt in irrigation water could also damage landscape, parks and other environmental attractions for tourism.

As concerning the impact of wastewater on the local tourism development, wastewater has the potential to cause pollution to surface and groundwater reserves and insufficient or inefficient waste water treatment systems have a direct negative impact on the quality of water and therefore on the ecosystems which affect inversely the tourism industry. The lack of trained treatment staff and the seasonal aspects of wastewater production can cause operational problems, which reduce the effectiveness of treatment [4].

Another source of water pollution, which may be associated with tourism activity is leakage from solid waste. In isolated areas or where the normal solid waste disposal system is not able to absorb water production caused by the seasonal influx of tourists, the quality of freshwater can be affected by leakage from uncontrolled disposal of solid waste. Direct discharges of poorly treated or untreated waste water into water bodies (sea water or rivers), polluted rivers and lakes affect the quality of fresh water and sea water.

The EEA (2003) study estimated tourism contributes to 7 per cent of all pollution in the Mediterranean Sea. As reported, tourists consume up to 300 litres (880 litres for luxury tourism) and produce nearly 180 litres of wastewater per day.

This results in large volumes of sewage discharge to sewage treatment plants or to the sea and rivers and has a particularly detrimental impact when tourist facilities are in isolated areas and are not connected to the water treatment networks. In any case, if water is not treated, recycled or deposited properly, it will cause pollution and is undesirable when considering sustainable tourism.

In some highly-touristical regions and countries of the European Union, tourism development requirements have been among the main drivers for the development of water and wastewater infrastructure. For instance, in Austria, the Water Act of 1959 was issued with a view to protect the rich surface water bodies of the country. The first great success in applying this act for water protection was eutrophication abatement at the Austrian lakes in the 1960 and 70ies, which threatened tourism development and hence Austrian economic development [5].

From our viewpoint, it is very interesting and important that the need and political will to safeguard water resources, mainly the lakes in

Austria, from pollution and eutrophication, have determined a strong, effective legislation and policy which somehow anticipated the requirements of implementing the Water Framework Directive (60/2000/EC). As for the Urban Waste Water Directive (271/91/EC), although Austria decided not to declare any sensitive areas, the state applies water emission standards meeting the sensitive area requirements of UWWD in regard to phosphorus, as for all the lakes in Austria eutrophication is limited to phosphorus availability. Therefore, in Austrian municipal waste water treatment, the P (phosphorus) removal requirements start already at a size of 1000 p.e. design capacity, which is more stringent than UWWD (requiring the P removal starting at a size of 10000 p.e. design capacity, for sensitive areas) [5].

Another country heavily relying on the tourism industry for economic growth is Greece. Without ignoring the current difficult financial situation of the country, we focus here on the strong link existing in Greece between the development of the local and regional wastewater infrastructure and the corresponding tourism activity.

In the 13 regions of Greece, the extent of treatment of wastewater is related to the prosperity of the area served. The relative wealth of the region in gross national product (GNP) (expressed as a percentage of the country's average) correlates with the extent of wastewater treatment coverage (expressed as a ratio p.e. to t.p.p. – total permanent population). Therefore, a larger proportion of the population is served by municipal waste water treatment plants (MWTP) in richer areas than in poorer areas. The relationship between economic wealth and sanitation coverage is represented by a rough factor of 1.5 – that is if a region becomes 2% “richer” there would be an increase in p.e. served by MWTP of approximately 3% [6].

In cases where regions have a p.e./t.p.p. of more than 100% this is due to high tourist activity and the MWTP design for future capacity. Since a major source of Greece's income is tourism, it is in the interest of the tourist areas to maintain a clean environment. The above mentioned study (Tsagarakis, Mara and Angelakis, 2001) shows how the extent of tourism in the 13 Greek regions (nights spent in the region by tourists as a percentage of the country's total) correlates with the extent of sanitation coverage (p.e./t.p.e. served).

One important conclusion of this research was that a 2% increase in a region's tourist activities (compared with the country's total) would result to a 5% more p.e. served by MWTP. Although the authors

specify that the above analysis should be treated qualitatively, given that tourism itself is a main economic factor in Greece's development, (“economy” and “tourism” are intercorrelated) the main conclusion was that tourism strongly influenced the wastewater treatment sector in Greece.

3. Current features and challenges in the development of water supply and sanitation in Romania

It is quite embarrassing but real: adequate water supply and proper sanitation is still an important development issue in Romania, even after acceding in the European Union.

The actual development gap of water supply and sewage utilities not only hinders Romania from fulfilling EU water quality standards but also jeopardizes human and environmental safety in some regions and areas (mostly rural) and therefore inhibits the start up and development of new businesses (such as tourism business), capable to plenty use and enhance potential value of local natural and human capital [7].

As we shall briefly point out below, the current situation of the water/wastewater infrastructure development is critical in Romania and at regional levels: inadequate water treatment, poor sewerage network and low access to centralized water and wastewater systems are the main weaknesses of this environmental sector.

Only about 65% of the population benefit from mains drinking water supply and indoor plumbing. This includes 98% of urban population and 33% of the rural population, quite low ratios in comparison with those in Europe, respectively 96 -100% of the population connected to public water supply network in urban areas and 87% in rural areas. Even worse, only 52% of Romania's population is connected both to water and sewage services and more than 70% of the wastewater is untreated or insufficiently treated and flows directly into natural receivers.

Therefore, water pollution is one of Romania's largest environmental issues, with negative impact on fish breeding, irrigation, and drinking water supplies. Poor water quality arises mainly from poor controls over industrial effluents and discharges and from inadequate wastewater infrastructure.

This situation is mainly due to the long-term under-investments in the water supply and sewage systems. The state of the sewers infrastructure is less developed or modernized in comparison to water intake systems due to smaller consideration in towns and total neglect in rural areas [9].

By analyzing, the evolution of variables in Figure 1 and Figure 2 below we can say that:

Fig.1- Evolution of the sewerage system as compared to the water supply network in Romania (total and urban)

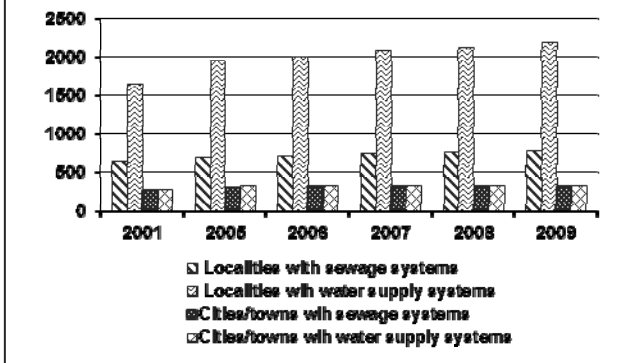
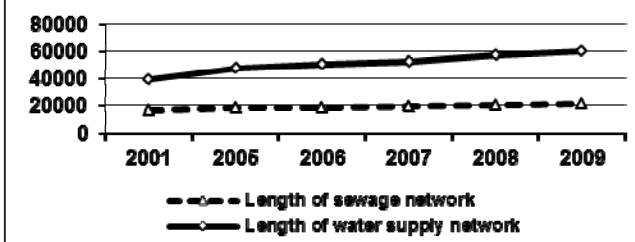


Fig. 2 - Evolution of the sewerage system as compared to drinking water distribution network, as the simple total length (km)



- public sewerage network in Romania is much less developed nationally than the public drinking water supply, which indicates a serious imbalance and the absence of the integrated nature of water services, as a major weakness of this sector of infrastructure. Thus, the total number of localities with public sewer is only approx. one third (35.4% in 2009) of the total number of localities supplied with drinking water network;
- the situation in towns and cities is more balanced in the sense that almost all (97% in 2009) towns and cities supplied with drinking water, have also public sewerage, so the big gap between the two types of water services occurs especially in rural areas;
- a worrying aspect is that sewerage systems are developing at a pace considerably slower than the water supply network, and the gap appears to widen in recent years even after the approval and implementing of the European Cohesion Fund investments (of the axis 1 under SOP Environment). Thus, while the

total length of water distribution network increased by over 55% in 2009 compared to 2001, during the same period the sewage network has expanded by only 26%, so with a 50% lower growth rate.

As regards regional development of public sewerage network, development regions with the highest percentage of residents who have homes connected to sewage systems (of the region's population) are: 1. Bucharest-Ilfov region, with a rate of 81.5%, explained by the vast agglomeration of Bucharest; 2. Western region, with 48.1%; 3. Central region, with 49.6%. The lowest percentage of residents with homes connected to sewage systems relative to the population is in South Muntenia region: 28.3%.

We also tried to express the relative level of rural regional development of water distribution systems and public sewerage networks, by using two synthetic indicators, namely:

- Irureg1apa: Percentage of localities with drinking water facilities, out of the total number of villages in the region;
- Irureg2can: Percentage of localities with sewerage network, out of the total number of villages in the region.

Table 1 - Relative level of rural development in Romania of the public water and sewerage networks, by development regions (2009)

Development regions in Romania	Irureg1apa(%)	Irureg2can(%)
1. N-E	48	17
2. S-E	76	14
3. S-Muntenia	51	9
4. S-V Olt	33	5
5. Vest	58	15
6. N-V	71	15
7. Centru	56	16
8. Bucuresti-Ilfov	43	3
ROMANIA	54	13

Source: Own computations with primary data from the Romanian Statistical Yearbook, 2010, INSSE

It is easy to notice the huge gap between the water distribution systems and the sewerage related. In our opinion, this is one of the most important features of water infrastructure in Romania and also a major shortcoming for sustainable economic development, given that waste water is discharged directly into the environment, polluting soil and water.

This seems to be due to the lack of a strategy for integrated development of water and wastewater infrastructure in Romania, not to mention the lack of

implementing a coherent national strategy for sustainable development so far.

As concerning the actual connection to the wastewater treatment plants, it has to be mentioned first that in Romania, only 40 % of the population is connected to a sewer system connected to a waste water treatment plant WWTP (2010). For clusters with more than 10,000 p.e. (i.e. large and medium cities - urban areas), the degree of connection to wastewater treatment plants is 66.22%. For clusters with p.e. 2000-10000 (i.e. towns, communes and villages, predominantly rural areas), the degree of connection to wastewater treatment plants is only 5.30% [9].

The Cluj, Sibiu, Iasi counties have the highest degrees of connection to sewage plants, of over 60%; there are also counties such as Braila, Caras Severin, Mehedinti, which have the lowest levels of connection to WWTP, i.e. below 5%. These latter counties are geographically close to the Danube, so the bulk of untreated wastewater flows, without preliminary treatment (and more or less directly) into the Danube, worsening the pollution and the eutrophication risk in the entire area of the river basin. Actually, in 2009, the most important volumes of wastewater discharged were recorded in the river basins: Danube, approx. 40.6% of the total; Jiu about 13.4% of the total; Mures, approx. 10.8% of the total.

One of the great problems in the water sector and another feature of the current wastewater infrastructure in Romania, is the very low proportion of treatment (only approx. 20%, according to our computations for the year 2009) of the total wastewater, discharged into natural receivers. However, we noted that out of the total treated volume of wastewater, 68.9% in 2008, and 74.7% respectively in 2009 were treated by municipal treatment plants, which may represent a trend to comply with Directive 91/271/EEC concerning urban wastewater treatment.

4. Conclusion

Romania is seriously lagging behind with providing water and wastewater collection and treatment services, while the quality of water streams highly depends on the capacities and quality of treatment of wastewater from human activity. The problems related to the surface and groundwater quality come mainly from untreated wastewater being discharged to the open streams, which amount to about 79% of all wastewater produced in Romania.

Since Romania adopted the environmental acquis and aims to collect 60% of discharged wastewater by 2015 (which means to double the capacity available in 2004), the investment needed in this field represents a great challenge for the country, from financial, economic and administrative point of view. Moreover, the whole territory of Romania is declared as sensitive area, thus all agglomerations of more than 10,000 p.e. should be endowed with wastewater treatment plants providing advanced treatment level (nitrogen and phosphorus removal).

For the period 2004 - 2018, total investments required in Romania for compliance with European Directives on drinking water and wastewater were estimated at the huge amount of 19 billion euros. The funds allocated by Sectoral Operational Programme (funded by the Cohesion Fund and national co-financing) and the National Rural Development Programme (funded by European Regional Development Fund for Agriculture) represent only about 17% of these needs [10].

Therefore, taking also into account the current adverse international financial environment, we believe that a strong integration of the economic development with the environmental infrastructure development strategies are more than ever required in Romania, in the efforts to step out from recession and to comply with the European directives for sustainable development.

We believe that Romania's tourism potential is quite large and a sustainable tourism development strategy should be locally and regionally integrated with the water and wastewater infrastructure development strategy. This should enable the full consideration of the tourist and indigenous demand for the design of water/wastewater utilities as well as a better assessment and quantification of all the costs and benefits in the Cost-Benefit Analysis of the major water projects.

To end on an optimistic tone, we should welcome a small but important step in this direction: following a Decision of the Ministry of Regional Development and Tourism (February 2011), tourism areas will have priority in obtaining funds to carry out public works according to GD no. 577/1997.

Concerning the sub-program works for water supply, sewerage and wastewater treatment in rural areas, allocation of necessary amounts will be done with priority for places in tourist areas and places of tourist interest. (Decision establishing these criteria was taken as the Ministry of Regional Development and Tourism has allocated

insufficient resources in 2011 to complete all the rehabilitation, modernization and/or asphaltting of roads and water supply, sewerage and wastewater treatment in rural areas performed according to GD no. 577/1997 already opened).

Future further research should be dedicated to a more accurate estimate of the correlation between the development of tourism activity and the development of water and sanitation in some poorly served areas of Romania.

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