
RELATIONSHIP BETWEEN WATER POLLUTION AND ECONOMIC GROWTH IN THE REPUBLIC OF KOSOVO

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Abstract: The continuous development of the economy of the Republic of Kosovo has been followed by a large number of polluting emissions, affecting the quality of the water basin, which has undergone significant changes. In order to study the effects on the country's watershed and economic development as a result of a pollutant discharge, this paper analyses the relationship between economic growth and pollutant emissions in the Republic of Kosovo. The aquatic ecosystem is being endangered by the trend of development such as increasing pollution, especially urban, industrial and agricultural, energy generation, tourism, creation of irrigation dams, deforestation in watersheds, obtaining aggregates for construction, etc. Wastewater emissions and waste collected by industry and its basic units, as well as municipal waste resulting from incomplete and inadequate management failures can generate many negative effects. To further examine the relationship between pollutants and economic development, conventional pollutant emissions and economic development trends have been studied. It has been found that the relationship between industrial wastewater discharge and Gross Domestic Product (GDP) is more coordinated, that is, industrial wastewater emissions with the development of the economy show a variable trend. The paper aims to highlight urban impact on further environmental degradation by suggesting ways to reduce the impact of pollution in the Republic of Kosovo. Analysis and assessment of the natural and biological condition of rivers is very important and necessary for their protection, use and improvement. The aquatic environment of rivers is constantly changing and for this purpose field researchers insist and direct their goals in identifying modifying factors and finding ways to establish natural balances in them. The data used in the research are collected from the database of the Kosovo Agency for Statistics (KAS), the Ministry of Environment and Spatial Planning (MESP) and the Kosovo Agency for Environmental Protection (KEPA).

Keywords: pollution, economic growth, watershed, waste, Republic of Kosovo.

1. INTRODUCTION

Water, in all its forms and in all its cycles, is at the center of environmental balances, as a mediator of life itself, but also as part of the common heritage of man and nature. The Republic of Kosovo in its catchment area is rich in rivers and lakes, while their flow is accompanied by a large number of settlements where many urban and industrial centers are distinguished. These aquatic ecosystems are endangered by the development process such as the increase of pollution, especially urban, industrial and agricultural, energy generation, tourism, creation of irrigation dams, deforestation in watersheds, obtaining aggregates for construction, etc. Kosovo, in the last decade has been under the constant influence of uncontrolled anthropogenic and natural activities, which have changed the balance of the country's aquatic ecosystems.

Assessment of the natural and biological condition of rivers is very important and necessary for their protection, use and improvement. The aquatic environment of rivers is constantly changing and for this purpose ecologists insist and direct their goals in identifying modifying factors and finding ways to establish natural balances in them. As surface water pollution due to floods in the rainy seasons has increased significantly in recent years, even more than population growth rates, other factors including climate change must be taken into account.

This paper represents an effort and a research to highlight the impact of urban and economic development rates on further environmental degradation by suggesting ways to reduce the impact of pollution in Kosovo.

In addition, the main purpose of this research is to analyze and evaluate the effects of anthropogenic activity and economic development on the pollution of the water system (surface and groundwater) in the Republic of Kosovo. In this regard several objectives have been set: pollution assessment from industrial water discharges and municipal wastewater and review of legislation and existing measures for emergency management for prevention and protection of the aquatic environment.

The main contribution of this paper is highlighted as following:

- Assessing the effects stimulated by the anthropogenic activity and economic development on surface and groundwater is the main interest for the health of the citizens of Kosovo and the activity of firms;

- Establishment of a system for the management of the pollution sources along the river flow as a necessity for disciplining discharges and achieving acceptable values of water quality within the parameters of national and international directives;
- Promoting social responsibility and corporations for emergency management of the protection of the aquatic and terrestrial environment throughout the country;
- Aquatic ecosystems constantly threatened by the high interaction of the human population, industrial and agricultural developments need to be monitored periodically as well as invested to restore water to its original state.

Water quality in Kosovo basins has been and is currently under the influence of several factors. However, we emphasize that the main impact comes from anthropogenic activities and economic activity, and mainly from urban runoff, pollutants coming from individual and collective wastewater discharges. As important factors are also infiltrations from agriculture, discharges from industries, mainly light industry, which carry out their activity in these water basins.

The structure of the paper is set as following: the first section gives the introduction regarding the topic, objective and importance of the paper as well as the main contribution, the second section incorporates the research analysis, while the last section reveals the conclusions and recommendations.

2. LITERATURE REVIEW

The detrimental effect of water pollution on the flora and fauna which live in river and marine habitats is well-documented. Even the deleterious impacts that such contamination can have on human health further up the food chain have been investigated to a strong degree. But aside from the environmental cost of water pollution, what do we know about the economic one?

According to the recent report of the World Bank (2019), by using the largest ever database collated on water quality, it was found that economic growth could be damaged by water pollution by as much as a third in certain countries, owing to factors such as increased healthcare spending and reduced agricultural yields, alongside the fiscal side of ecosystem damage. In addition, Malpass (2019) argued that “Clean water is a key factor for economic growth,” and also published recommendations on how best individual governments and collective organisations can work together to alleviate the problem.

In addition, the realization that water has an impact on economic growth has triggered the need to emphasize and understand the nature of this impact. The Pacific Institute (2007) concludes that the scarcity of fresh water is ‘already an economic constraint in major growth markets such as China, India, and Indonesia, as well as commercial centres in Australia and the western United States’ (Pacific Institute, 2007).

Previous research, in particular by Barbier (2004), has found that water usage has an impact on economic growth. This was based on a limited data set, and Barbier himself called for further analysis. But there has been very little further analysis of the impact of water quality on growth. Later, Bretschger and Smulders (2007) emphasized that the dynamics of the depletion of natural resources needs to be researched by natural economics, where water is expressed in the model as both the ratio of water utilization, which stands as a proxy for water scarcity,¹ and as water quality, which stands as a proxy for the value of wastewater treatment.

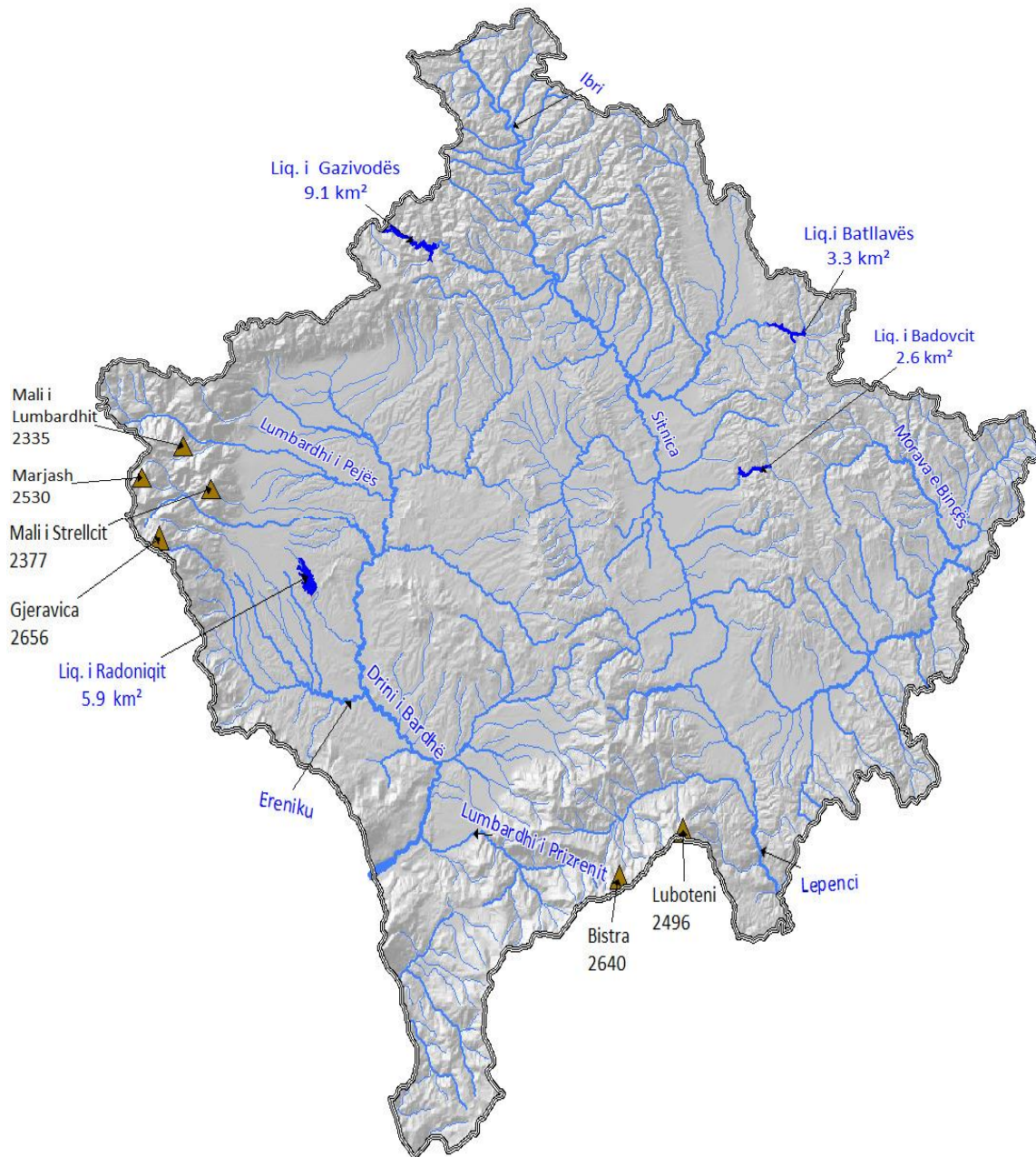
Further, Fracasso (2014) found evidence that countries that have scarce water resources find it hard to export virtual water and tend to import water services embodied in agricultural goods. To the extent that this is a constraint on economic activity, we might expect scarce water to impact GDP per capita but not necessarily growth.

3. WATER POLLUTION AND ECONOMIC GROWTH IN THE REPUBLIC OF KOSOVO

Kosovo is one of the poorest countries in water in Europe, but its hydrograph counts several rivers, lakes and springs that are vital for our country. This water poverty is related because all rivers originate in Kosovo, while flowing into the seas of the region. Kosovo has several karst springs, thermal and mineral water springs, glacial valleys and lakes. Natural and artificial lakes are: Lake Radonjic, Lake Radavc, Lake Mitrovica, Lake Perlepnica, Lake Livo,, Lake Vasileva, Lake Breznica, etc. Their importance is very great as water supply, fishing and refreshment. While, artificial accumulators: Ujmani, Batllava, Radavci, Radoniqi etc. It is estimated that 70% of the population has access to the water supply system. The other 30% is supplied by wells which are unsafe sources.

On the other hand, Kosovo marks several rivers: Drini i Bardhë, Sitnica river, Ibër river, Mirusha river, Nerodime river, Morava e Binçës, Lepenci, Ereniku, Lumbardhi of Prizren, Drenica river etc.

Figure1. Main rivers and lakes in the Republic of Kosovo



Source: Statistical office of Republic of Kosovo.

Industrial water is one of the main polluters of surface and groundwater. The industry needs water for 150 million m³ per year, approximately 30% of total expenditure. The biggest polluters are KEK, Ferronikeli, Sharrceci, the mines of Trepça, Kizhnica, Artana and other mines. This is illustrated in the following figures.

Figure2. Industrial water discharge.



Source: State Statistical Office.

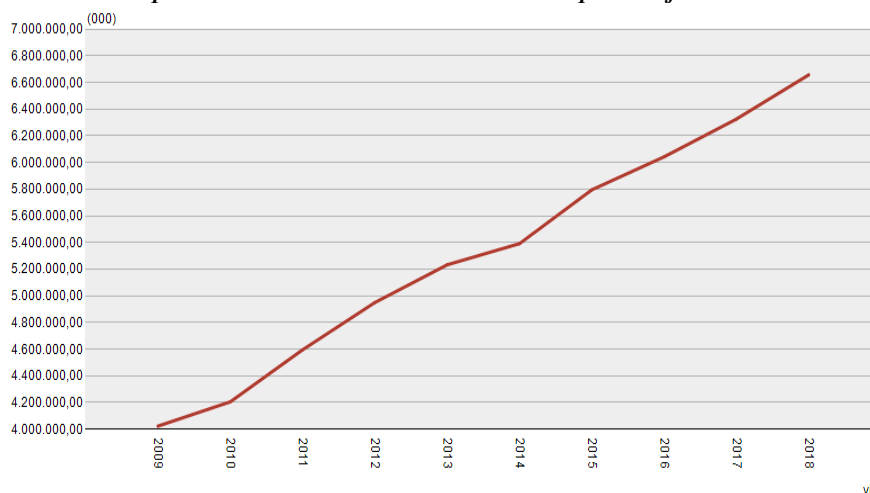
In order to illustrate the view of the water pollution in the Republic of Kosovo, the following figures are used, so that it can be illustrated visually.

Figure3. Water pollution in the Republic of Kosovo



The next graph illustrates the development of the economic growth, measured by the Gross Domestic Product, in million euro. In addition, as can be noticed, we can witness a continuous increase of the GDP in the Republic of Kosovo, for the time period 2009 – 2018. In 2018, the GDP is approximately twice as its value in 2009.

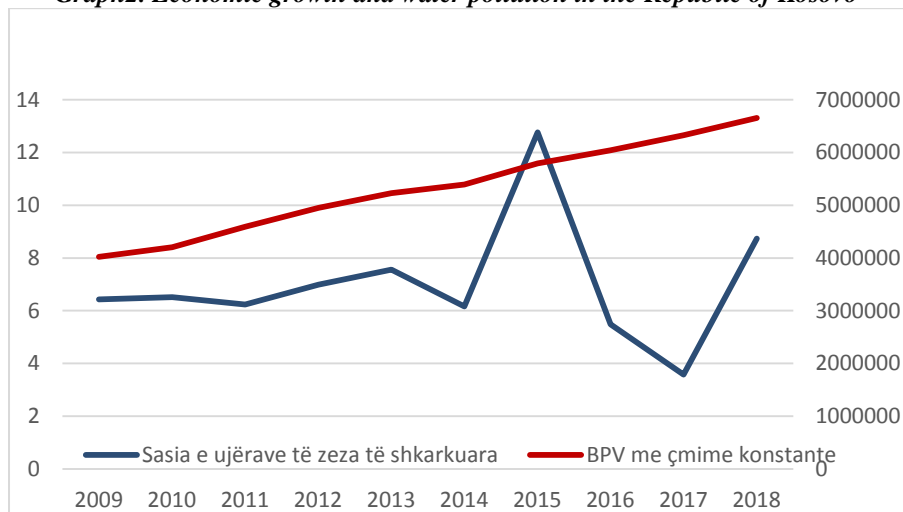
Graph1. Gross Domestic Product in the Republic of Kosovo



Source: National Bank of the Republic of Kosovo.

The next graph illustrates the graphical comparison of the trends of the economic growth, shown by GDP in millions euro and water pollution. As we can see, in 2014 we can notice a slight decrease of the water pollution in 2014 and 2017, while the highest value can be noticed during 2015 and 2018. Yet, regarding the economic growth, experience an increasing trend in the Republic of Kosovo.

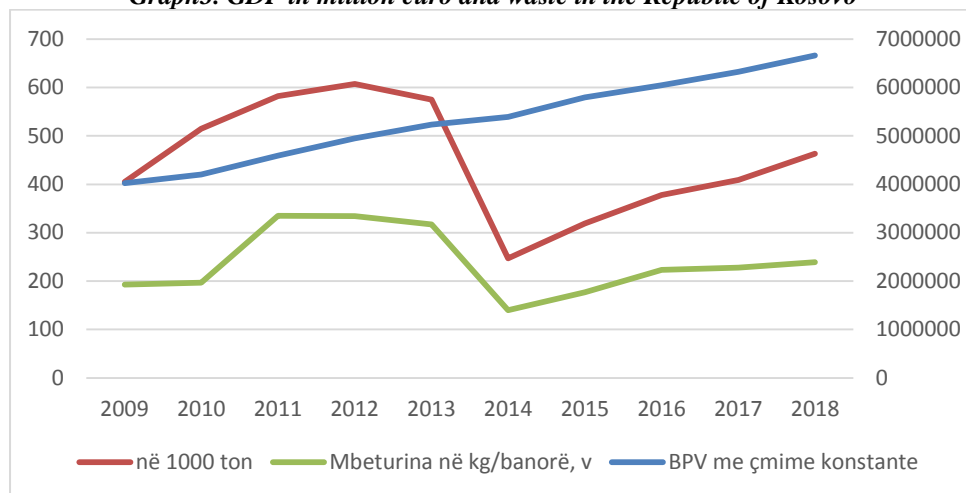
Graph2. Economic growth and water pollution in the Republic of Kosovo



Source: State Statistical Office of the Republic of Kosovo.

The next graph illustrates the graphical comparison of the trends of the economic growth, shown by GDP in millions euro and wastes in kg/person. As we can see, in 2014 we can notice a slight decrease of the wastes in tones, and also per kg/person. Yet, after 2014, both of these indicators experience an increasing trend in the Republic of Kosovo.

Graph3. GDP in million euro and waste in the Republic of Kosovo



Source: State Statistical Office of the Republic of Kosovo.

4. CONCLUSIONS AND RECOMMENDATIONS

The economy of the Republic of Kosovo is followed by a large number of polluting emissions, affecting the quality of the water basin, causing to face significant changes. Thus, the main aim of this paper was to investigate the effects on the country's watershed and economic growth as a result of a pollutant discharge, this paper analyses the relationship between economic growth and water pollution in the Republic of Kosovo.

The Republic of Kosovo is in an alarming situation because there are serious problems with both the quantity and quality of water. Also, there is no minimal wastewater treatment from either collective or individual pollutants. As a result, all wastewater ends up in surface and groundwater without any treatment, significantly aggravating their quality. All wastewater discharges into the recipient are made without any prior treatment. Sewage discharged out of watercourses mainly ends up in groundwater posing a potential risk to the water supply resources of the water supply of the population outside the water supply systems.

Having into consideration the picture of the wastewater and economic growth in the Republic of Kosovo, thus to improve and enhance surface water quality we recommend the attention to be focuses on the following recommendations:

- Start as soon as possible the treatment of urban wastewater before discharge of them in rivers. Install a water treatment plant;
- to evaluate the interaction of air, soil and water, which contribute to each other's pollution as well as to human health;
- continuous monitoring of water in the rivers near springs used for drinking water and agriculture, as well as taking measures for avoiding secondary sources of pollution in order to preserve natural balances.

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