

ECONOMIC AND FINANCIAL RISKS IN ENVIRONMENTAL PROJECTS IN ROMANIA- CLIMATE CHANGE PERSPECTIVE

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Abstract

Becoming a global problem, dramatically accelerated by human activities, climate changes tend to integrate economic and financial risk management both at the level of development strategies as well as large scale projects. Once related to climate change, it outlines specific approaches of this risk category as well as comprehensive analysis - using structural models - of the implications of environmental responsibility to measure the effectiveness of using EU funds. Considered to be extreme risks, climate change, due to specific characteristics, have the gift of highly eloquent outline the importance of economic and financial risk management. This research summarizes the basics needed to take into account - as a result of complex risk analysis - by those who decide on the opportunity of EU funds involvement in projects designed to add sustainable value to beneficiary communities.

Keywords: *climate change, economic and financial risks, environmental protection projects*

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INTRODUCTION

A little unusual for the economic environment, tackling climate change during discussions on financial and economic risks becomes more pressing in the current context. Climate change is an ongoing process with impact more or less directly over all economic sectors. Therefore, their presence can no longer be ignored and the assessment and management of economic and financial risks should consider how local manifestations of this global process may affect the development of classical economic indicators.

In order to address the financial risk, it is necessary to distinguish between risk and uncertainty, in particular the amount of information available for financial decision making. In this case, the risk is useful in situations where there are several possible results and of which there is a relevant prior experience, to define a statistical model that allows predictive results. The main categories of financial risk related to macroeconomic environment are (Bârsan-Pipiu, Popescu, 2003):

- Country risk;
- Organization, operation and monitoring of financial and banking system;
- Stability and flexibility of legislation and legal system;
- Organization and operation of insurance system;
- General economic development and inflation evolution;
- Dynamics of interest rate on domestic and external market.

In Romania, one of the most obvious characteristics of environmental quality relates to striking deficiencies in environmental infrastructure, especially in urban wastewater treatment and water supply and sanitation in rural areas. Therefore, when assessing financial and

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economic risk, should be considered the principal shortcomings and current issues (Adler & all, 2009):

- relatively low population access to water supply network (only 65% of households, 56.5% of population was connected to the public water supply in 2011);
- poor quality of drinking water;
- low and unbalanced coverage of areas with public sewage networks (total sanitation coverage degree was, in 2011, approximately 43.5% nationally, the share of connected urban population is 78.45% unlike rural population, only 9.23%);
- public sewers is much less developed than the national public water distribution network, indicating an imbalance and lack of integrated character for water services as a major shortcoming of the sector; total number of residential areas with public sewer is less than half (37.4% in 2011) of the total number of settlements supplied with drinking water network;
- lack of or insufficient wastewater treatment facilities (only 32.2% coverage of treatment services in 2011, so that treated wastewater accounted for only 35% of spills);
- Sometimes poor management of water / wastewater system.

All these issues leave their mark negatively on prospects for socio-economic and human sustainable development, both in sectoral and regional plans, as well as in smart economic recovery, recommended in Europe 2020 Strategy and heavily promoted in long-term sustainable development strategies incorporated to environmental projects financed from European funds.

1. ECONOMIC AND FINANCIAL RISKS IN INFRASTRUCTURE – GENERAL OUTLINES

In terms of economy and pragmatically speaking, Romania's ability to provide efficient infrastructure and services in the environmental field, both nationally and locally, is also an important factor in economic development. Importance of investments in environmental infrastructure, under a program of economic recovery, emerges from research dedicated to actual environmental infrastructure and its management, which shows that provision of infrastructure can influence economic activity both in demand and supply especially through the following three paths (Platon, 2004):

- infrastructure services, such as providing recycled materials and water can be an important raw material for industry;
- infrastructure can be complementary to private capital and labor force, where a high quality infrastructure network can decrease the waste of water, raw materials, fuel and land;
- infrastructure can directly increase the overall production capacity of one region, attracting labor force and private capital from other regions. Private firms may be attracted to a certain area because entrepreneurs appreciate infrastructure services for own consumption or because they believe this will lead their companies to be more productive.

At EU level, researches have been developed to determine if infrastructure stimulates economic growth. Even if evidence suggests fact that more extensive infrastructure network is typically associated with higher economic activity, identification and verification correlation between environmental infrastructure and economic development at local, regional or national level is still a conceptual and methodological challenge for economic research. Normally, access to Structural and Cohesion Funds can enable Romania, through projects like the one mentioned here, to develop balance in regions lagging behind, to upgrade transport and environmental infrastructure, to support rural development, create new business and employment opportunities, promote social policies to increase the standard of living, to avoid depopulation of areas or towns with massive economic present migration (Del Bo, Florio, 2008).

However, experience shows that the EU structural funds, if properly directed and managed, represent the greatest opportunity for sustainable development in Europe, there are two main areas where it can be observed this positive impact: investment in environmental infrastructure (such as the sewage, water purification stations, waste management) and transport infrastructure (Lang, 2008).

Based on sector strategy and in accordance with stringent environmental needs assessment in Romania, the first field goal of *SOP, Priority 1 Extension and modernization of water / wastewater* requires most of the investments, especially public investments. This priority is financed from the Cohesion Fund and investments aim to ensure progress in terms of compliance with environmental acquis and thus reduce disparities between Romania and the other Member States on this issue. Economic and financial risk management related should be managed so that any loss can be assessed in any of the following steps (Bârsan-Pipiu, Popescu, 2003):

- Identification of all types of risk;
- Understanding each type of risk;
- Early assessment of risk;
- Define risk management policy;
- Determination of risk limits;
- Establishing and implement procedures for risk management;
- Risk control.

There is a general scientific consensus about the fact that climate change and instability and climate warming may be partly attributable to emissions of greenhouse gases (GHG), emissions caused by the global population. It is expected that water availability will decrease everywhere, because higher rainfall in many regions, except the South East Europe, are offset by greater evaporation due to higher temperatures. There are many options for adaptation - reducing water consumption, energy consumption, or by organizing a more efficient consumption - but the globalization of climate change involve all the countries both in the joint effort to combat these disastrous events as well as in development and implementation of risk management strategies enabling economic and financial sustainability (ANPM, 2007).

2. ESTIMATES OF THE ECONOMIC AND FINANCIAL RISKS IN THE WATER SUPPLY AND SANITATION FIELD IN ROMANIA

Because development level of infrastructure is a major factor of competitiveness, the World Bank estimates of developing countries shows that they annually invest only 3-4% of their GDP in infrastructure, compared with a required of 7-9%, which would allow a higher rate of growth and achievement, in an appropriate timeframe, of the objectives of poverty reduction and efficient use of financial resources attracted (World Bank, 2008).

Unfortunately, poor infrastructure presents a striking similarity between Romania and the poor and developing countries in Asia and Africa. Romania is still underdeveloped in terms of infrastructure providing water supply services – distribution and water treatment – and, especially, in terms of sewerage services – collection and treatment (Frone, 2012). Both developing countries as well as developed countries face key challenges regarding water sector, challenges which can be tackled by European funding. Some of these challenges are (OECD, 2009):

- increasing water scarcity;
- the need to increase access to water supply and sanitation in developing countries;
- the need to rehabilitate infrastructure.

A key constraint is due to the fact that water / wastewater sector is considered by potential financiers (banks, institutional investors, private equity funds, equity investors, project sponsors, etc.) as a high-risk sector with low efficiency. Unfortunately, the economic crisis

has left its mark on the population ability to pay, even for basic needs such as water, and on the other hand, it has limited the access to favorable terms financing of investment for this sector. A recent report by the World Health Organization has estimated that, in order to expand existing infrastructure and thus achieve the Millennium Development Goals (MDGs) related to water, about 32 billion \$ annually worldwide are needed for the period 2010-2015 in capital costs. In the following decades will become increasingly important to invest in water supply systems and sanitation (WSS) resistant to climate change, which will cause further increase in investment costs and recurrent costs for WSS. In Romania, the costs of WSS services alignment required by the EU environmental standards have been estimated at nearly 15 billion euro by the end of 2018. These costs are primarily investment costs for infrastructure development for distribution of drinking water, sewerage and wastewater treatment plants (WHO, 2012).

When public guarantees are not available, financiers have to rely on the cash flow received by the utilities, which is affected by the tariff affordability and resilience, and also by contract reliability or settlement agreements, which sometimes are likely to be exposed to the risk of reinterpretation and political interference. Thus, service charges and taxes are payments of services of water / wastewater by the user, and are very important instruments. Such is now the case for most environmental infrastructure, operational and maintenance costs should be covered by user payments (Platon, 2004).

In assessing potential investment opportunities, private sector operators will be influenced mainly by characteristics of project such as sustainable good prospects for early cash flow, good market potential, strong political support for the project, the general legal and contractual law well developed, regulatory independent system and sound macroeconomic policies and prospects. Only then an environmental project financed with European funds becomes feasible and viable. One way to analyze the economic and financial risks in the water sector is by identifying specific features of risks. That way can be applied adequate management measures or mechanisms (Frone, 2013). In summary, the main risks specific to WSS projects are presented in the table below.

No	Risk category	Consequences
<i>Financial risks</i>		<i>Affect the financing of investment projects in WSS sector.</i>
1.	Credit risk	WSS major projects are capital-intensive and non-banks (difficulty of attracting commercial loans).
2.	Risk of reduced profitability	WSS projects are less profitable and non-attractive to investors (difficulty of attracting funds on the financial stock market).
3.	Risk of Disengagement of European funding	Ceasing funding for continuation or completion of investment.
4.	Macroeconomic risk	Macroeconomic instability will affect the price of capital attracted from the financial market.
<i>Economic risks</i>		<i>Affects the value of project costs and revenues in WSS sector.</i>
1.	Commercial risk of demand	Failure to pay and incomes below the forecast in the feasibility study.
2.	Risk of competition	Incomes below projections in the feasibility study (reduced demand due to competition).
3.	Major Force	Romania is prone to earthquakes, floods and an extreme climate (extremely cold, very hot weather).

4. Other risks	Increased investment and operating costs.
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Table 1: Financial and economic specific risks and consequences for WSS sector²

Risk of major force, with a fairly high probability of occurrence, is the most significant in terms of the influence of climate change on economic and financial risk management. Romania is particularly prone to extreme natural phenomena and even catastrophic due to its geographical position. Situated at the intersection of three tectonic plates, makes the risk of large earthquakes to be fairly high, damage being dependent on the intensity and duration of the earthquake. Also, situated in a geographical area with temperate continental climate and increasingly frequent excessive accents, makes extreme weather - floods and landslides, high temperatures in summer and very cold in winter - to affect most of Romanian territory, increasing the risks associated with investment projects in WSS sector.

During the last decades the identification and analysis of financial risks related to the water sector (RFA) has increasingly become a priority for financial institutions and banks who realize that they are becoming increasingly exposed to a range of water-related risks through their clients, whether they are service providers of water or drinking water intensive products (UNEP, 2006). Although RFA are increasingly taken into account by financial institutions until now there are or apply few means or instruments to identify specific risks to WSS sector, and most of the tools available address the environmental risk as a whole (Chiu, Bosher, 2005).

3. WATER CORE PROJECT - AN EXAMPLE OF ECONOMIC AND FINANCIAL RISK MANAGEMENT RELATED TO CLIMATE CHANGE

With a total budget of 2,547,859.04 euro, WaterCore project *Lack of water and drought. Activities co-ordinated in European regions* developed during January 2010 - April 2013, through Interregional Cooperation Program INTERREG IVC financed by the European Commission in 2008, where the Romanian side is represented by the Ministry of Environment and Climate Change, National Administration of Meteorology and Environmental Protection Agency Covasna, aims to provide regions of the seven participating countries (Romania, France, Germany, Italy, Netherlands, Hungary, Spain) a platform for experience exchange in the field of water scarcity, drought and climate change (WaterCore, 2010).

Constituting itself into a main objective of this project, management of drought and reduce effects due to pressures of climate change, has been the subject of a *Good practice guide* which guided the development of several analytical documents. Beneficiary of Water Core project conclusions are several economic sectors (housing, urban development, power generation, flood management, etc.), whose strategic decisions that will be taken in the next few decades can be favorably influenced by this project. Unfortunately, still large uncertainties about climate change appear within local level, where implementation of adaptation strategies, namely the contribution of management of financial and economic risk, is of a magnitude which does not reflect yet the seriousness of the problem (Hallegatte, They, 2007).

To these uncertainties are added those induced by the financial crisis that has destabilized financial balances leading credit institution in an area with too many independent variables (Cavalier, 2008). It has affected the EU cohesion policy and, obviously, Romanian cohesion policy, bounded during current period to identify the most effective solutions to combat economic recession through investment programs, particularly in infrastructure and energy efficiency, with additional participation to environmental projects.

² Source: Selection and personal considerations on *Investițiile în infrastructura de mediu: cerințe și oportunități de dezvoltare economică durabilă a României*, Frone S. 2013.

Because the Water Framework Directive establishes a legal framework to protect and restore clean water across Europe and ensure its long-term sustainable use, it is regarded as the first European directive which ensures sustainable development - by harmonizing the socio-economic development system with the capacity of the aquatic environment. Based on this Directive, WSS financial and economic risk analysis aims, for 2010-2027 period, identification of total costs for the implementation of European directives on water quality and of national action program, which amounts to approx. 20 billion euros (ANPM, 2007).

Therefore, without being able to exhaust the various aspects and problems of sustainable development of the WSS sector and the main risks during the financial and economic crisis, the methodology found in all environmental projects with European funding, including *Core Water Project*, is based on the following (ARA, 2003):

- Clarification and definition of main methodological and operational concepts;
- Analysis and synthesis of characteristics and mechanisms of economic and financial risks;
- Charts and diagrams to describe correlations and mechanisms of such risks;
- Qualitative assessment of risk (risk matrix);
- Case study and analysis of good practices.

Uncertainty of economic, financial and political evolution leads to internal risks, mainly related to financial stress and activation of increasingly higher environmental risks. Moreover, on the background of global crisis, widespread aversion to risks forces risk management to respond swiftly to feedback and also to economic forecasting horizon. On this background, the anticipation of short-term inflationary episodes becomes a major concern (EC, 2013).

Even if financial transactions, due to their diversity nature, almost always involve some degree of risk due to material losses, in EU funded projects, transparency on loans given in terms and conditions stipulated in loan contracts becomes the most important prerequisite for positive results. If in terms of statistical and mathematical analysis of financial activity risk it involves assessing the likelihood of getting some favorable (gain) or negative (loss) results, taking into account uncertain and probable future events, financial risk is subordinate to elements of the expected economic phenomenon (Bhaduri, 2012). In this issue, *WaterCore* project has managed to harmoniously combine public utility with the least risky financial and economic decisions.

CONCLUSIONS

Given the exigencies of economic and financial risk management, financing environmental projects from EU funds should consider better and more specific tools, such as climate protection projects and preliminary examination to detect potentially hazardous projects. In order to assess the impact of structural funds financial interventions on mitigation and adaptation to climate change, it is necessary to support re-focus of regional economies to low carbon emission infrastructures. Also, in order to select by the managing authorities only projects that take into account environmental protection, public pressure is a legitimate exercise (Katarova, 2009).

Following the case studies analyzed, of which we stopped for a brief overview on *WaterCore* project, there was revealed that most environmental projects previously financed from European Funds could be classified rather in general environmental policies than in mitigate climate change policies. However, these projects have contributed, even if indirectly, both to reduce GHG - by promoting the production and use of green energy - and reduce natural damage – through interventions to reduce hydro-geological risks. Intervention areas considered relevant to address climate change remain clean technologies, energy, environmental infrastructure, carbon sink, sustainable mobility, climate change mitigation and

adaptation and economic and financial environmental risk prevention and management (Adler et al., 2009).

For environmental projects financed from European funds, together with detailed cost estimate, economic and financial risk assessment is an essential element for success. Therefore, this risk analysis should be made in detail, divided into components of the project, supported by valid scenarios and based on detailed data in order to allow an overview of all economic and financial risks that may threaten the project. Also, the estimates should indicate the local costs and those from external funding, local taxes, design, supervision, legal and administrative costs associated with the project, consultant fees and subsidies in case of price increase as well as other factors. As a beneficiary of this type of detailed analysis, *WaterCore* project offers an example of good practice.

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