

NOVIWAM: Five European countries together for improving water quality and water use efficiency

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Abstract

The European NOVIWAM (NOvel Integrated Water Management Systems for Southern European Regions, www.noviwam.eu) program aims to promote interregional co-operation in the field of water management tools and methods. One of its originality is to analyze in depth the relations between decision makers, stakeholders and researchers in order to disseminate know-how and technologies, and to tackle the compelling water management problems faced in the Euro-Mediterranean climate regions. In a first period, aiming at a good ecological and chemical state of waters and at a sustainable and efficient resource management, five European countries/regions (Albania, Cyprus, Poitou-Charentes in France, Northern Region in Portugal and Andalusia in Spain) are working together. The program will thus contribute to the objectives of the European Water Framework Directive. But additionally, the NOVIWAM program will establish a schedule for the implementation of a « Join action plan », trying to involve other countries into it, and generalize the conclusions of this three year work at a regional and international level.

Keywords: NOVIWAM Project, IWRM, Europe

1. Introduction

In most Mediterranean countries, there is a growing awareness around the issues related to the management of water resources. In a context of increasing scarcity of resources, quality issues, environmental concerns coupled with a greater intersectoral competition, the introduction of integrated management methods and more effective tools have become a priority. In 2000, European countries have established a common tool for water management, known as the Water Framework Directive (WFD). The objective of this Directive is to achieve good status of water resources both qualitatively and quantitatively. It aims to prevent and reduce pollution, promote sustainable use, protect the environment, improve the health of aquatic ecosystems (wetlands) and mitigate the effects of floods and droughts. The general principles are the recovery of water management costs by the users of the resource,

taking into account environmental costs and water use efficiency. To achieve these ambitious objectives, the WFD imposes the identification of European waters and their characteristics, by river basin districts and the adoption of "management plans" and "Program of measures" appropriate to each of them

The NOVIWAM (Novel Integrated Water Management Systems for Southern Europe) project (2010-2012), within the 7th Research and Development Framework Program, works for the facilitation of the achievements of these European Union (EU) directive goals. Involving five European countries particularly marked by problems of water shortage or of water quality, this project aims to promote multilevel and interregional co-operations in the field of water management tools and methods. By learning from the experiences of others and pooling the related knowhow and technology, the partners want to increase their capacity to solve in the most ecological and economical efficient and sustainable manner the compelling water management problems faced, beyond the five members of Noviwam project, more generally in the Euro-Mediterranean climate regions. The final goal of this initiative will be to generalize the actions associated with the project to potentiate the internationalization of the activities of the participants.

To help achieve these objectives, the NOVIWAM project will develop a Joint Action Plan (JAP). For this purpose, a communication process will be established between the clusters ; the specific Strengths, Weaknesses Opportunities and Threats (SWOT) of each one and for all of them together will be analyzed taking into account the specific characteristics of all of the agents involved: researchers, companies and regional authorities. This JAP will address aspects such as the identification of possible co-operation research areas and their characterization. Additionally, the NOVIWAM project will establish a program for the implementation of the JAP itself, trying to involve other regions into it, and for the dissemination of the conclusions of the work at a regional and international level. The NOVIWAM project will also establish a long-lasting relationship between the participating clusters, promoting mentoring and mutual learning activities as well as further co-operation activities beyond this project.

The work in the NOVIWAM project is divided into six work packages; four coordination work packages; one dissemination and one management work package, each comprising several subtasks, in order to achieve the envisaged goal of the project with optimal efficiency.

The present paper insists particularly on the results of the first work package which consists of the collection of information about the water management situation of the participating regions and then the identification of the problems they face. The rest of the paper is organized as follows:

In the next section, we present the methodological approaches used in the project. The following section presents some results and elements of discussion. In the last section, we give some comments on this international project.

2. Methods

The methodological approach followed for the completion of the first workpackage is structured in five clearly differentiated parts, all of them aiming to obtain firsthand information for the later analysis using the SWOT analysis method, where the RTD (Research and Technology Development) in Integrated Catchment Management tools will be evaluated, both generally for the five participating regions and individually for each NOVIWAM region.

The first stage was a deskwork analysis on physical conditions (climate, water resources, soil and land use, population distribution...), on economic conditions, on water and supply demand, on research capacities and last on water management: regime, legislative process, public involvement. Then proper identification of relevant regional actors from varied profiles (authorities, consultants, catchment managers, researchers or other groups of interest) has been undertaken in order to prepare the next task concerning the characterisation of the regions and their research agendas throughout surveys and interviews. A detailed stakeholder power analysis was performed at the regional scale, in order to map out the most relevant actors

and the relationships between them. Proper identification of relevant actors minimizes the time spent as well as facilitates the gathering of more reliable results.

Secondly, a detailed investigation was done again through desktop work on the socio-political context affecting or being affected by water management and by the WFD. This work was distributed amongst partners taking into account the previous knowledge and experience of each of the organisations. Rather than limiting the work to a mere analysis of the literature, the objective was for the partners to share its own experience, background information and know-how.

Thirdly, a large survey was used to confirm, infirm or complete the necessary information for this first workpackage. Actors identified out of the stakeholder power analysis were invited to answer an online questionnaire developed by participating partners, where questions relevant to each of the subtasks were uploaded. The stakeholders targeted by the survey were companies, research centres, decision makers and water managers. The first set of questions of the survey was aimed to frame the respondent and questions such as contact, position, name and type of organisation details, etc. were included. This questionnaire was also used to enquire about the main areas of expertise of the participating experts so that he/she was directed to the questions aimed specifically to gather information for his/her activity. The results were then exported into a spreadsheet programme, the raw data being treated and organised by region and also globally. A regional revision of the results and a translation of the open text responses were carried out by each of the region's participating partners in order to provide a regional perspective to the information gathered on this survey.

The next phase was the interviewing of selected candidates that task leaders as well as regional clusters identified as being experts, experienced professionals in the water sector, in the participating regions. The interview script was developed by those responsible for the questionnaires elaboration and was reviewed by the workpackage leader, considering that the main objective of the interview was to tackle all the key questions to characterise each region situation for water catchment management and to cover all the gaps left after the questionnaire analysis. The results from the interviews were used to complete the desk and questionnaire work, as well as to build a more general idea about the socio-political situation of each region, related to water issues

The final stage of the methodology was the reflexion on the gathered data and the drawing of conclusions for all the five regions, constituting the core of the SWOT analysis that will later serve as a basis for the elaboration of a Joint Action Plan.

The Joint Plan Action addresses aspects such as the identification of possible co-operation research areas and their characterization and a series of clustering strategies to be promoted and implemented throughout the participating regions.

3. Samples of results

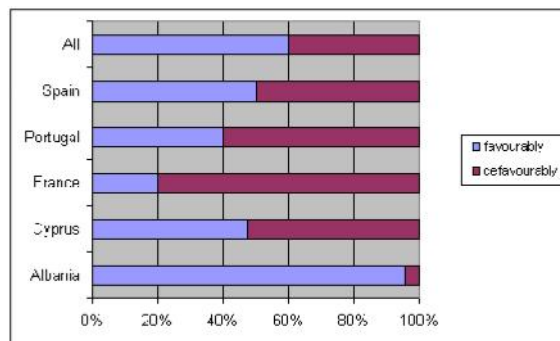
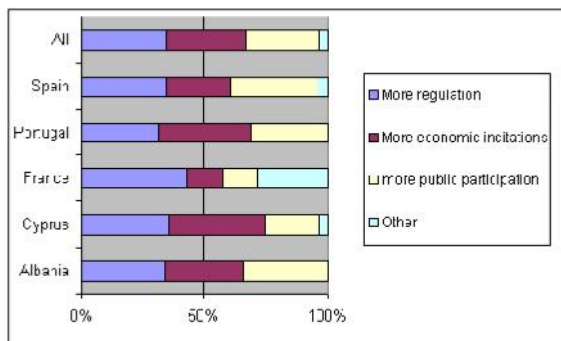
The deskwork analysis allowed obtaining some results bringing some required precisions on the situation of the five countries/regions relatively to water issues. One of the common issues was the relatively important place of agriculture in water consumption, compared to the share of this activity and food processing in the economic sector, except for Albania. Of course, strategic consideration on national alimentation self-sufficiency alone implies that the solution to water shortage might not come simply from a reduction of irrigation activities.

	Population	Gross National Product/inhab.	Employment in Agriculture	Employment in Industry	Employment in Tertiary sector
Cyprus	886.000	21.600 €	4,40%	22,50%	72,40%
Albania	3.640.000	8.900 €	58,00%	15,00%	27,00%
Poitou-Charentes	1.740.000	26.300 €	3,40%	23,20%	73,10%
Andalusia	8.239.000	24.700 €	4,50%	29,30%	66,20%
Northern-Portugal	3.750.000	17.500 €	11,60%	30,50%	57,80%

The second stage of the project, the surveys of different stakeholders in the five regions, allowed gathering data on their expectations on the evolution of the situation, as well as on the ideas of the most efficient tools to attain the WFD, in their opinion. Here are some examples of the results of these surveys:

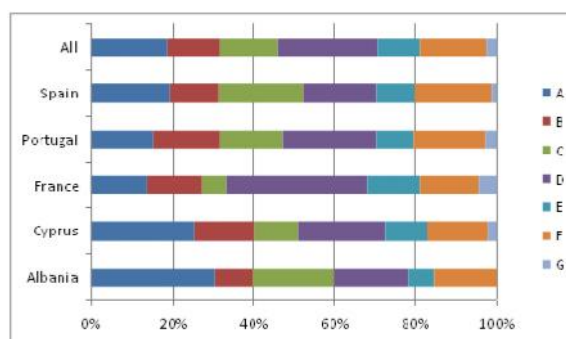
What are the main possible factors of the evolution of water supply during the next ten years in your basin area or your country?

About the balance between supply and demand (quantity/quality), do you think it will evolve in the next years:



These results (graph on the right) show that despite an anticipated increase in water demand, Albanians are very optimistic, especially compared to other countries, on the evolution of the supply-demand balance. The solution (graph on the left) may come, according this survey, in a balanced way from regulation, economic tools and public participation.

Tick three initiatives that in the long-term you think would be the more efficient to solve water pollution problems in your area:



A: Increase public investment on wastewater treatment
B: Increase authority support to wastewater reclamation

C: Adjustment of payment for sanitation services towards the achievement of full cost recovery

D: Measures for decreasing diffuse pollution problems instead of control of effluent pollutant maximum limits

E: Improvements on private point-source treatment

F: Stricter adjustment of discharges according to water quality goals instead of control of effluent pollutant maximum limits

G: Other

Although differences between the answers are quite noticeable according to the countries, due the reasons described in the deskwork report, we observe that initiatives of all these different natures are perceived as potentially efficient.

The third stage of the project consisted in interviews made in the five regions/countries. Our objective here is not to give a summary of their results, but to emphasize different facts:

- The complexity of water use in agriculture, and especially for irrigation, is now well recognized. Each farmer is in a rather complex situation, with a lot of constraints due the nature of his/her activities, his/her family, past investments, financial situation, markets, and with also personal objectives for his/her exploitation and household; and in a context of growing uncertainties due to economic considerations and to the internationalization of the agricultural markets, not speaking of climatic uncertainties. So the solution to the problem of agricultural water demand, the most important for a majority of the considered countries for the JAP, will probably not be unique, but will rather consist in a sum of partial solutions.
- More coordination is asked for the management of floods, between the building of new infrastructure and facilities, regulation and flood prediction tools.
- Wastewater reuse is considered by many as a new potential resource.
- Developments of economic tools are asked for; notably in substitution to regulation, or in complement.
- Regulation must be accompanied by efficient control, in different fields (wastewater treatment, water allocation...).
- There is always needs for building new infrastructures (for example for wastewater treatment, or dams for regulating river flows); most of them must also be accompanied by establishing water management tools (e.g. real time dam management).
- Economic incitations and public participation are also emphasized as important tools to improve water state.
- Quantitative and qualitative problems are now well known to be related.
- The absence of coordination between the structures in charge of water management may sometimes become a source of inefficiency. Moreover in some countries there is a feeling of the existence of a barrier between the administrations and the citizens.
- Globally, in the context of present economic difficulties, water is a resource the potential of which is probably not fully exploited, of course taking into consideration the necessary improvement of the environment (the over-exploitation in some areas must rather be considered as an ill-exploitation).
- More partnership between enterprises, administrations and universities or research centers have to be encouraged, notably in order that research addresses really important issues and supplies efficient solutions.
- An evolutionary and adaptive work strategy between these three partners is really expected.
- The WFD is an efficient stimulus for the improvement of the situation.

The fourth stage of this first work package, the SWOT analysis, led to these main conclusions:

Concerning the strengths, different problems are now well known and described, especially concerning the balance between water supply and demand, quality problems, plus an increase in the concern regarding extreme events (mainly floods); the observation of a generalized willingness for improvement; sound legal framework and the relative economic development allowing the implementation of the decision (but with remaining difficulties in Albania).

What are thought as the main weaknesses are the uncertainties due to the direct and indirect effects of the present economic crisis and also subsequent limitations in funding. The complexity of the network of legal competencies, especially in France, is leading to a dilution of responsibilities. The complexity of the bureaucratic proceedings to submit projects, which delays the development and implementation of important tools, is also emphasized in some countries. The non-optimal allocation of water use and the lack of efficient economic tools for water management are described as one of the main weaknesses.

The major opportunities lies in the EU priorities for sustainable use of water, in the increased environmental and social sensitivity by public, now conscious of the necessity to find cleverly a balance between economic development and environment preservation and in the dense research institutes (on technical, decision support system, economics... problems) spread over the different countries, with the capacity to conceive and help to implement efficient solutions to the more crucial problems, multiple connections to be developed between research, authorities, companies and other stakeholders.

The main threats are financial constraints, the toughening of the opposition between 'economics' and the 'environment' and the increases in the frequency and severity of droughts and floods, the exacerbation of water scarcity impacts, the degradation of water quality, the changes in the volume, the timing and quality of stream flow and recharge, the changes on aquatic ecosystems etc., which are going to affect all socio-economic spheres and sectors.

This analysis helped to define the orientations toward which the main actions should be directed. The reflection on the results from this WorkPackage will lead to a program proposal. In the end of this section, we give some general orientations for the JAP.

The main orientations which are likely to be followed by the JAP concern water social and economic value, management of extreme event scenarios and modeling cumulative impacts on rivers provoked by infrastructures and economic activities (among them agriculture).

The research will address issues such as the development of operational sustainable water management systems capitalizing on the potential of the concepts of ecosystem services and natural capital, more analyses on specific water pricing schemes, water value and costs, water quality assessment methodology.

The expected outcomes are, among others, methods and coherent and shared protocols to provide consistent and integrated datasets and knowledge, efficient irrigation water pricing systems, model predicting responses in urban areas due to heavy rainfall events based on different scenarios. But of course, the JAP is still under development, and will take into account all the results of the other Noviwam workpackages.

4. Conclusions

In this paper, we have shown how five European countries/regions are working together to tackle water resources issues. We have further shown how the opinions of various groups (the researchers, the public or stakeholders, and decision makers) have been fundamental to the spirit of this project. By doing so, the relevant problems concerning water resources management could be addressed from the different point of view of the different segments of society. This leads at the same time to a better understanding of water issues and to a better orientation of research toward more practical problems.

Some of the regions studied in Noviwam project may be seen by other Mediterranean countries as regions rather well-off concerning water availability. But the abundant supply is already cleverly used by its inhabitants until the saturation of the water usual supply has been reached. As climatic conditions are rather fluctuant and as the forecasted climate change may translate in this matter as having more amplitude and greater frequency of unusual climatic periods or events (for instance, drought, gale, floods), this creates periodic problems of imbalance between supply and demand, from which the environment is the loser. Moreover, the economic conditions are all the more erratic than the economic development encourages and is based on tighter relations between different geographic or economic areas. Summing up, the first common problem for the five NOVIWAM Regions is the necessity to take risks and uncertainties for water

management into account more efficiently, focusing on their different components (for example, water quality and quantity, anyway inter-related). Failing this, more crises will arise, translating for example in issues such as the inefficient banning of water use during the summer in France, severe imbalance between water supply and demand in Cyprus, or more generally in the degradation of the relations between different parts of the population (farmers against ecological militants and so on). On top of these problems, everybody is now aware that all the economic development is based on an environment of good quality, in addition to the fact that it is more attractive to live in such an environment. The structures of water management and of public participation are rather dense in each of the five NOVIWAM Regions but are evolving to adapt to changes in the regulatory, economic and social context. Now what is truly missing, in order to hit the target, and particularly the objectives of the WFD, is real links between research, managers and water user representatives. Preliminary contacts show a very promising pooling of ideas between these partners - they only wait to be developed.

5. References

Noviwam Project Website <http://www.noviwam.eu/>

Deliverable of the Work Package 1. *Noviwam Project*.