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NOSTRUM-DSS

NETWORK ON GOVERNANCE, SCIENCE AND TECHNOLOGY

FOR SUSTAINABLE WATER RESOURCE MANAGEMENT IN THE MEDITERRANEAN.

THE ROLE OF DSS TOOLS

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Consensus Document

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This report is part of Nostrum-DSS Workpackage 6 **Bridging science and policy for integrated water planning**, Task a, Deliverable D6-1.

The work presented in this report received the contribution of several researchers from the different partner institutions, and also collects the feedback from stakeholders of different countries present in the Science and Policy Workshop held in Bari.

Introduction

According with the Nostrum–DSS Description of Work (DOW), one of the main deliverables of WP 6 - Bridging science and policy for integrated water planning is the Consensus Document. The purpose of this document according to the DOW is to reach the consensus of policy makers and relevant stakeholders about the outputs of the Coordination Action.

1.1 Context

Sustainable development is being seen as the basis for a genuine balance between economic growth and environmental values. In fact, there is a considerable corpus of literature based on empirical evidence showing that the degradation or depletion of the environment affects in different ways people inside societies and among countries, creating, increasing and reinforcing new ways of social and economic discriminations.

To accomplish the necessary growth of well-being, without compromising the capacity of natural resources also producing that well-being for future generations, is a challenge that implies to cut with the existent relationship between economic growth and natural resources use, which has driven to the present situation of environmental degradation. It means also to shift to a paradigm of natural resources management, instead of natural resources exploitation, to bring to a halt the present unsustainable patterns of production and consumption (UNDP, 2001). In fact, it is important, that at the same time man develops technology, which can enlarge the limits of the carrying capacity of ecosystems, to reduce, by means of effective policies, the patterns of consumption and to adapt practices of conservation of natural resources (Bartelmus, 1999).

The UN Millennium Declaration (MD), the Plan of Implementation of the World Summit on Sustainable Development (WSSD), the EU Water Initiative, and the Millennium Development Goals (MDGs), are the focal orientation for the work being carried out in the frame of NOSTRUM-DSS Coordination Action. In particular the following subjects are key references:

- Plan of implementation of the WSSD (WSSD-PI): the development of Integrated Water Resources Management plans by 2005 with strong public participation (IV 26 page 15 of the WSSD-PI), transparency and accountability is a key approach to reaching the targets of the MDGs;
- Goal 7 of the MDGs: Ensure environmental sustainability, and in particular *Target 10* (Halve by 2015 the proportion of people without sustainable access to safe drinking water and sanitation) and *Target 9* (Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources).

In the Mediterranean basin, wide differences in water supply and demand characteristics exist and no individual case study may be a representative of the entire region. Some countries suffer problems of overexploitation of groundwater while others suffer from water quality degradation. On the other hand, some have enough or plentiful water but lack institutional structures to manage water efficiently, while others have scarce and limited water and seek non-conventional water like desalination or importation of water.

The Mediterranean region has a key common environmental feature that is related with the existence of a more or less longer dry and hot season. This creates important stress on water resources due to irrigation needs. In fact, in this region, irrigation cannot be seen as a way to increase and improve agricultural productivity. Irrigation in the Mediterranean region is essential to ensure agricultural productivity. Furthermore, there is a clear contrast between northern areas (receiving abundant water resources from temperate regions) and southern areas that are adjacent to semi-arid regions, with very scarce water resources.

Water resources are a societal issue. Considered frequently as a common good, water is essential to life and to numerous human activities, and suffers their negative impacts. In the Mediterranean region, the significance of irrigated agriculture, the intense urbanisation, and the tourism are increasing their demands for water, requiring therefore important efforts to find new strategies to better manage this scarce resource.

In EU countries, the process of water resource management is driven by a clear compulsory end point: the water status has to be good after WFD implementation. However, Mediterranean Partner Countries (MPC) are not bound to any international duty to achieve certain objectives in their watersheds. The responsibility of carry out different measures should be shared among public authorities and stakeholders depending on competencies. This requires building capacity of involvement of all interested partners in catchments' planning and managing. The key measures to be implemented should be:

- Allocation of financial and human resources for responsible administrations (government prerogative). The countries' administrations in the region have some shortages of human resources and funds to carry out the tasks necessary for proper catchments' management. This shortage is also seen about knowledge and skills in the light of new EU perspective, although this kind of capacity is gradually improving;
- Assessment and collection of data needed for decision making by (re) designing monitoring programs, added scientific research and/or by analysing the results of international research projects, experiences, and all available national data;
- Involvement of national experts into water protection projects;
- Design seminars for stakeholders with targeted relevant information (some general information on watershed management) in an easily understood way with possible cooperative proposals (clear benefits should be stated). Of particular importance is the integration or coordination of spatial planning and basin management, which should discuss with the responsible institutions for spatial planning (municipalities, counties);
- Development of integrated GIS databases for decision making support;
- Assessment of technical equipment needs and filling the gaps;
- Training courses for local and state managers, with experience exchange meetings.
- Curriculum adjustment of academic programs to align contents with water management needs. This will create national human resources and expertise needed for successful management of the water at the national and in catchments.

In the long-term the growing water demand of Mediterranean countries can only be met from three sources. These are the use of renewable water sources; desalinating sea water; and reallocating irrigation water to more productive uses. For many countries the first alternative

is no longer possible, and for many others it will provide water for only a decade or two. Desalination of sea water is a solution, but an expensive one. However, in the long-term it seems likely that it will become even more important as other water sources are fully used, having the great advantage of the limitless amounts of fresh water which can be produced. Finally, the reallocation of irrigation water could be the most likely immediate solution to water demand problems over the next two decades, but depends of political decision (Beaumont, 2000).

Water policies in the region need to face:

- A lack of tradition of public involvement and integrated work with other institutions trying to achieve common goals;
- A public more concerned for its well-being than for the environment, posing a challenge for environmental administrators, since raising economic welfare is beyond their jurisdiction;
- Lack of capacity both for the administrations and the stakeholders to effectively manage watersheds;
- Lack of environmental awareness and responsibility among non-environmental and even some environmental administrations, as well as among stakeholders;
- Lack of data for identification of problems, assessment of the state of water resources and economic and stakeholder analysis.

Water management presents specific difficulties due to its various uses and to the important functions that it performs in almost all aspects of human activity. It is not always possible to harmonise the various uses of this scarce resource. Thus the sharing of water resources requires management based on rules that render possible its harmonious appropriation, establishing priorities in use, regulating the interactions of the various social actors (individual and collective), or in other words regulating the conflicts not only among these various actors but also among the various users of the water.

Bridging science and policy spheres it is an arduous task that requires the involvement of the different communities in the identification, discussion and implementation of policy measures concerning water resources management.

These two communities work in quite different contexts. Scientific community is more attached to work in an environment where the problems, although complex, should be well structured as a mean to reach the solutions. Policy-makers and decision-makers community often have to deal with ill structured problems, where a multidisciplinary approach should be adopted to find solutions. Moreover, frequently due to external factors, the decision agenda is continuously changing, since different issues are expecting decisions, which condition the decisional context for each specific issue in analysis. Furthermore, different accountability pressures, levels of intervention, time schedules and languages are very often contributing to difficult the communication and to increase the gap between two communities, whose role and commitment are crucial to produce robust decision-making processes.

Therefore, the involvement of different social actors in the decision-making processes and a strong collaboration between scientific and decision-makers communities is necessary. To

effectively bridge the gap between scientists, decision-makers and stakeholders there is a need:

- To narrow the relationships between these participants in the decision-making processes, based on the mutual trust, respect and understanding for the different fields of action, facilitating the permanence of channels of communication;
- To adequate the type of collaboration to the issues in question, and levels of intervention in such a way that practical policy-support could be provided by the scientific community

1.2 Structure of the report

During the NOSTRUM-DSS 3rd Thematic Workshop held in Milan (Italy) at 20-21 December 2006, some ideas on the contents of the Consensus Document were discussed in the frame of a Break-out Group. From the discussion held, it was possible to identify two main guiding principles for the contents of the Consensus Document:

1. The Consensus Document has to follow the orientations defined in the DOW, and therefore this document should report the Policy Makers and Stakeholders feedbacks regarding a set of final products of the Coordination Action.

This feedback is essential to assess which dissemination strategies of the Coordination Action's final products are feasible and not feasible and to adjust them, in terms of type and quantity of products and languages to be used, as a means to reach the widest possible public in the scientific and policy spheres.

2. The Consensus Document should also be prepared as a document aiming at influencing future developments of applied research in the field of DSS. Departing from the experiences of using DSS tools on water resource management in the Mediterranean Basin reported during this Coordination Action a set of "*recommendations*" should be drafted.

This report has two main chapters: section 2 refers to the feedback collected from scientists, Policy Makers, and other interested Stakeholders of different countries present in the Science and Policy Workshop held in Bari; section 3 outlines the recommendations about future developments of applied research in the field of DSS tools, and about possible follow-up activities.

2 Feedback about the outputs of the Co-ordination Action

The invited policy-makers to the Science and Policy Workshop commented the draft version of the Nostrum-DSS Guidelines base on short presentations, which were structured to answer to the following three questions:

- a) *Which is your general opinion about the Guidelines?*
- b) *How much are they appropriate and useful for your job?*
- c) *According to you, what would the best use and dissemination strategy for the Guidelines be?*

Furthermore, scientists and invited policy-makers were surveyed about the possible dissemination strategies. This survey was structured in the form of a set of matrixes.

2.1 Comments regarding the draft version of the Nostrum-DSS Guidelines

In general terms the draft version of the Nostrum-DSS Guidelines was considered by the different participants of the Science and Policy Workshop as a useful tool to increase the dissemination and use of DSS tools concerning water resource management, and as a significant step to bridge the gap between scientists and decision-makers.

The Guidelines were generally considered as a well structured, theoretical and conceptual document, which presents a wide variety of cases of DSS design and implementation with focus on: Actor and Problem Analysis; and on Policy/Decision Design and Choice.

Moreover, it was considered as a significant step to cover different DSS tools developed in a wide geographical context, turning these Guidelines a very useful web tool to decision-makers that don't have the time to read large written reports

Nevertheless, some comments were made in terms of contribution to ameliorate this final product of NOSTRUM-DSS Coordination Action:

- **To make clear the objectives of the Guidelines.** Efforts should be putted in giving the light on the usefulness of applying DSS clarifying the roll that DSS could play in relation to IWRM. DSS tools are conceived as a structure to support the decision-making processes that requires a robust methodological approach that covers the Planning and the Pricing of water resources, and the public Participation in water resource management. In definitive, DSS give support and are not the core base of the decision.
- **To better define the targets of the Guidelines.** Although targeted to the regional scale (i.e. generally the basin level) in which all issues related to the local scale are enclosed and taken into account, it was considered that they should be more technical as policy-makers usually refer to consultants during the decision process.
- **To better define the requirements of stakeholders' participation.** The main phases of the decision-making processes where stakeholders' participation is required should be more clearly distinguished in the Guidelines: in a first moment, active involvement of the stakeholders is more unstructured but crucial to prepare the choice of alternatives; in a second moment the stakeholders' participation is more

technical, quantitative and mathematical, and is essential for the phase of constraining and running the model.

- **To better classify the inventory of DSS tools.** Although very comprehensive, the inventory of DSS tools would gain in interest if the different tools were classified according with their objectives and/or with their prospective capacity. A very short description of the tool, the main strengths and weaknesses, best practices, when the tool was used, for what purpose, if it can be applied to its own situation should also be provided. The DSS database should help to choose a DSS pointing out why a certain DSS have been used instead of another one.
- **To present case-studies.** It was considered that the presentation of case studies representing adequate examples of effective use of those tools would be very useful to encourage the use of DSS tools by decision-makers.
- **To facilitate the communication.** The communication strategy should be adapted to the different types of decision-makers. Therefore, an Executive Summary must be written. This document should become a stand alone document that describes the objectives and activities independent from the main report of the Guidelines. Moreover, together with the Meta-Guidelines a tutorial should be made available to explain the functioning of the web-based tool and to assess the interests of the users. This document could be also complemented with a section of Frequently Asked Questions targeted both for technicians and decision-makers.
- **To increase networking with similar studies.** In order to achieve a greater dissemination would be very important to link the guidelines with other projects related with IWRM or ICZM, or with institution such as UN Water Programme. Furthermore, decision-makers are paying special attention to the recent developments made in the field of DSS tools; therefore a special effort should be made to link the Guidelines with institution such as: UNDP, UNEP, and UNESCO-IHP.

2.2 Comments regarding the dissemination strategies

One of the main constraining factors of dissemination of the outputs of the Co-ordination Action is the language issue. In fact it was consider that the use of the English as the only dissemination language will have a strong diminishing effect, especially among the countries that have the Arabic and the French as official languages. Moreover, it was consider that if local level stakeholders were the target of the guidelines, then it would be necessary to make available a version in Arabic.

Since there are strong financial constraints to make available versions in all languages of all NOSTRUM-DSS final outputs, it was recommended that only a short document (i.e. one page summary for Policy and Decision Makers) should be disseminated in each language of the countries involved in the project. The Guidelines, more targeted to technical level and the Policy Briefs, will be disseminated only in French and in English.

Scientists and invited policy-makers were surveyed about the possible dissemination strategies. This survey was structured in the form of a set of matrixes and the results are

presented in a companion document entitled “*Results of the survey on Dissemination & Policy Briefs.doc*”, available on the NOSTRUM-DSS intranet.

2.2.1 Effectiveness of different media to achieve the objectives of dissemination

As a result of the survey made it is possible to say that both researchers and policy makers consider different media to achieve different objectives. However, researchers consider more often **Local community related activities as a significant media**; and policy makers consider more frequently scientific activities such as publications, courses, presentations in conferences as an effective dissemination mean

2.2.2 Potential of NOSTRUM-Dss outcomes for achieving different dissemination objectives

The final outcomes of NOSTRUM-Dss will be especially significant to:

- Promote knowledge sharing and establishment of synergies within the Mediterranean research community

- Intensify links and cooperation between the science and policy spheres for the application of IWRM in the Mediterranean Area

Nevertheless, researchers have more confidence than policy-makers in the Potential of NOSTRUM-Dss outcomes

2.2.3 Assessment of the most suitable strategies to disseminate the NOSTRUM-Dss specific products

In general terms Internet was considered, by researchers and policy-makers, as the most suitable strategy to disseminate the NOSTRUM-Dss specific products: Best Practices examples, Meta-Database, Glossary of IWRM terminology, Policy briefs, Meta-Guidelines, Best Practices Guidelines.

2.2.4 Relevant deliverables to be disseminated as Policy Briefs

Researchers and Policy Makers have a rather different opinion about which of the project's deliverables should be considered for dissemination as Policy Brief.

The four documents most considered by the Researchers are:

- D6-2 Decision making processes, regulations & laws
- D6-3 Agent based models for water demand and supply
- D5-5 Development and implementation of DSS tools
- D3-4 Multi-disciplinary report

The four documents most considered by the Policy Makers are:

- D3-4 Multi-disciplinary report

D6-5 Governance for IWRM

D5-5 Development and implementation of DSS tools

D6-2 Decision making processes, regulations & laws

3 Recommendations

Departing from the experiences of using DSS tools on water resource management in the Mediterranean Basin reported during this Coordination Action a roundtable discussion has been carried out in order to draft a set of recommendations.

These recommendations cover the targeting of the European Commission research funding to bridge the gap existent between DSS providers (scientific and technical sphere) and the needs of DSS users (policy spheres). This gap can be overcome through providing capacity building:

- a) Training actions to demonstrate the adjustment of different tools to different types of problems and to different levels of intervention;
- b) Training actions to increase the skills of DSS users in working with these tools, encouraging the spread of DSS as a means to reach more informed and adequate decisions.

3.1 Future developments of applied research in the field of DSS tools: possible follow-up activities

It was considered that a network based on Nostrum-DSS could be a good base for setting up collaborations and to develop new curricula, capacity building and training, and to increase the discussion about issues for future collaboration.

These actions could be devoted to:

Develop a DSS for supporting the implementation of IWRM plans at national level.

Develop a DSS to assess cost effectiveness and to implement cost recovery practices.

The e-conferences could be used to discuss on the Nostrum-DSS Case Studies, to share information.

To analyze the gains of introducing new technologies versus traditional technologies (and knowledge) in the IWRM.

To analyze the impacts of the pricing of water in terms of adjustments at cultural, socio-economic and environmental levels

To understand the meaning of the price of water in terms of water supply and demand

Furthermore, the stakeholders involved in NOSTRUM-DSS Coordination Action specially perceived as important:

Training actions to develop technical capacity in working with DSS tools

Small workshops case-study-based with 10 days duration aiming providing concrete examples of case studies with explanations, field trips, training, demonstration actions on the application of DSS for IWRM.

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