



Nostrum-Dss

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NETWORK ON GOVERNANCE, SCIENCE AND TECHNOLOGY FOR SUSTAINABLE WATER RESOURCES MANAGEMENT IN THE MEDITERRANEAN. THE ROLE OF DSS TOOLS

CO-ORDINATION ACTION FUNDED BY THE EUROPEAN COMMISSION, SIXTH FRAMEWORK PROGRAMME, "SPECIFIC MEASURES IN SUPPORT OF INTERNATIONAL CO-OPERATION" MEDITERRANEAN PARTNER COUNTRIES (MPC), 2004-2007

What is Nostrum-Dss? www.nostrum-dss.eu

The Nostrum-Dss Co-ordination Action (CA) aims at contributing to the achievement of improved governance and planning in the field of sustainable water management within the Mediterranean Basin by establishing a network between the science, policy, and civil society spheres and through the development and dissemination of Best Practices Guidelines for the design and implementation of Decision Support Systems (DSS) for Integrated Water Resources Management (IWRM) in the Mediterranean Area.

The scope of the project is to develop these Guidelines with the active participation of scientists, policy makers, and key stakeholders, through the implementation of a structured sequence of actions aimed at favouring efficient exchanges of information, knowledge and experiences between the various components of the CA.

The Nostrum-Dss project therefore intends to contribute to a more policy-oriented research community and a more informed policy and decision-making processes.

All the public outcomes produced up to now in the context of Nostrum-Dss are freely downloadable at: www.nostrum-dss.eu

Editorial

The Nostrum-Dss Coordination Action (CA) is getting close to its end. This issue presents and summarises some of the final products of more than three years of collaborative work between colleagues of 15 countries around the Mediterranean Sea.

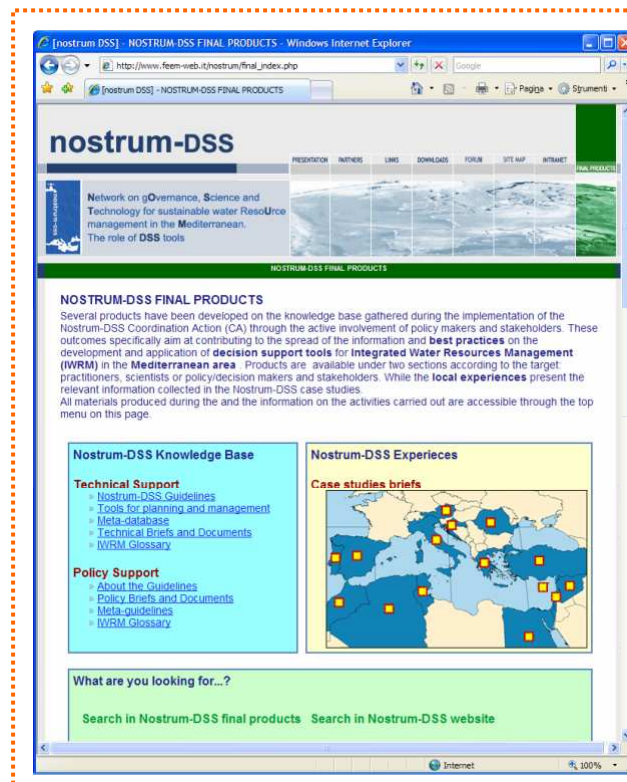
During this period more that 40 researchers collaborated for developing a series of products (reports, guidelines technical and policy briefs, web resources), intended to contribute to improved design and broader adoption of Decision Support Systems for fostering the adoption of Integrated Water Resources Management by the competent authorities of the area.

The difficulties encountered for the adoption of enhanced methods and tools – such as the DSS's – in the practice of water management are well known. One of the reasons most widely recognised for limited adoption is the insufficient involvement of stakeholders since the earliest phases of development. For this reason, more than 300 stakeholders were involved since the first year for eliciting their views and real needs and for better understanding the specificities of water management in the various parts of such a diverse geographical area.

We have also tried to avoid "reinventing the wheel", whenever wheels were already available. For this reason we have set up a series of collaborations with projects and research groups outside of the Nostrum-Dss

Consortium and organised a series of open activities and joint meetings. Moreover we have developed most of the final products around the concept of meta-information. In practice, they were developed upon the state of the art of pre-existing knowledge and focused in particular on filling the existing gaps and facilitating access to information.

We believe that our experience can be of use for practitioners and researchers willing to know *how* water management could be improved and *what* experiences, methods and tools are available around the world. For that reason we have developed a web site (see screenshot aside) that can be used as a gateway to all our products and to a broadest set of resources. Our plan is to maintain and develop these resources for the years to come. ❄



IWRM Science Communication for Impact

By *Jacopo Crimi, Yaella Depietri & Carlo Giupponi*

FEEM, Nostrum-Dss Consortium

Nostrum-Dss project's activities have the ultimate aim of contributing to the achievement of improved governance and planning in the field of sustainable water management within the Mediterranean Basin and to foster the involvement of local key stakeholders.

Following the collaboration undertaken between researchers and stakeholders during the first year of the Coordination Action (CA) for the drafting of the National Reports, the subsequent actions implemented by the Consortium constantly sought for stakeholders' participation and involvement in the project's activities.

For instance, the outcomes of the First and Second Nostrum-Dss Thematic Workshops held in Sousse, Tunisia (February 2006) and of the Technical Workshop held in Aswan, Egypt (April 2006), provided recommendations and good practice examples to be taken into account in the subsequent analyses focused on Decision support Systems (DSS) potentials and requirements to support the implementation of the Integrated Water Resources Management (IWRM) principles.

Decision makers were also involved in the Science and Policy Workshop held last February 2007 in Bari (Italy) to discuss the Nostrum-Dss draft Guidelines for improved DSS development and application,

elaborated by the researchers on the basis of the insights collected during the previous face-to-face meetings.

Strong concerns about the most effective strategies to bridge the gap between researchers and the policy world also early emerged in the course of the CA. A specific e-conference was this year dedicated to this theme.

The e-conference

The first Nostrum-Dss e-conference on "IWRM Science Communication for Impact" allowed for a broader participation of researchers and practitioners and aimed at contributing to some of the issues tackled by the *EU Water Initiative - Water for Life* and in particular to the need of strengthening the research impact on policies and society which largely depends on the communication strategies. As pointed out in the introductory message by the EC project officer Ms Tamborra, with less than a decade left to reach the Millennium Development Goals, it is important that researchers and policy-makers make efforts for enhancing the Science and Policy dialogue.

Communicating science means disseminating research results and making them become part of the culture

The participants to the e-conference Session I addressed the following questions:

1. *Which are the most suitable methods and tools to address policy makers?*
2. *What are the success factors used to communicate science to policy makers? Do you have examples for providing evidence?*

A second session of the nostrum-Dss e-conference was launched on the 8th of May 2007 and addressed the theme: "Local Multi-stakeholders Dialogue. Experiences and tools for

stakeholders' negotiation and dialogue".

The following presents a summary of the main contribution received within these two sessions.

E-conference Summary

According to the e-conference's participants, communicating Science means showing research results to the public and making it become part of the culture. Besides, Science is able to communicate when it represents a changing factor and has direct implications in everyday life and on the common needs and yearnings. Clear ideas, especially if strengthened with concrete examples, are to be communicated in an original way, preferably through mass media, and should have practical effects in everyday life.

In general, an essential factor towards this objective was acknowledged to be personal contact.

Primary "tools" and factors behind successful Science-Policy interaction and communication are the people involved. The right kind of persons are good listeners, able to:

- quickly map and translate different conceptual models and problem formulations;
- express their own ideas (or the ideas within a body of knowledge) in the 'language' of the listener;
- identify mutually beneficial opportunities.

In general, the experiences reported (including those of Nostrum-Dss) showed how decision makers are decidedly more engaged during face-to-face meetings which represent a very fruitful opportunity to acquire local knowledge about the traditional practices and decision-making processes in water resources management. However, a clear limitation factor to science and policy communication is the fact that politicians are generally interested in issues and actions which have effect in the short and medium term.

Means and tools for science communication

According to the contributors, ICT tools can be used to find new ways of working once personal contacts have



Figure 1. The Science and Policy Workshop

been established although they might also be used to make first contact. Then, when addressing specific communication issues between Science and Policy, the means to be used have to be carefully planned and succinct communication should be highly constructive and visionary. To effectively communicate project's results, a number of tools and strategies can ideally be used.

Good practices for successful project's implementation

To enhance chances of success, local government administrators and policy makers should be involved right from the beginning of the research projects and the involvement of economic sectors to finance phases of the project should also be fostered. Aside of the very important involvement of national and international organisms also in the framework of international conventions, a platform for active local participation may also enhance chances of successful communication between Science and Policy spheres. In fact, a project shouldn't be carried out in an isolated research context but within a framework of actions that was previously developed by other scientists and organisms at a national or international level. In this sense the greatest receptivity to the participation of international organisms and research groups is necessary together with the implementation of sharing and dissemination protocols with no copy right on results. The length and the way in which a project is usually carried out could play an important role in limiting the effectiveness of the project impact. For instance, the three years term usually assigned to single projects may not be sufficient and it would be convenient to extend the partnership to several related projects.

Close attentions have been paid to these approaches while drafting the Nostrum-Dss final products, as detailed in the following articles.

All messages posted within this e-conference have been uploaded on the Nostrum-Dss Forum:

→ <http://www.feem-web.it/nostrum/forum/viewtopic.php?t=99>

The Nostrum-Dss Guidelines

By Carlo Giupponi and Yaella Depietri
FEEM, Nostrum-Dss Consortium

Introduction

Water resources are scarce in the Mediterranean area and their future availability is highly uncertain. The resource is increasingly threatened by factors such as urbanisation, population growth and climate change which significantly contribute to its overexploitation and deterioration. Yet the current management regimes are to be improved as they are at times neither efficient nor sustainable and many obstacles exist towards the development and implementation of new, more effective modes of governance such as Integrated Water Resources Management (IWRM).

The Nostrum-Dss Guidelines aim at contributing to the improvement of water governance in the Mediterranean area

The achievement of concepts and principles of IWRM in decision making requires enhanced skills for the definition and implementation of a planning and monitoring cycle. However, the adoption of an integrated approach to water resources is particularly challenging in the Mediterranean region where sectoral approaches in water management are still prevailing. In the area, the low

availability of funds is at the heart of the question as it hampers the development of human capacities for the development and adoption of innovative strategies and technologies. In addition when institutions (such as basin agencies) are created, clear coordination between them is weak.

Alternative management options (i.e. use of renewable water, desalination, re-allocation of irrigation water to more productive uses) need to be carefully evaluated and considered for the definition of more sustainable strategies. At the heart of improved, transparent and equitable water management there is the need to adopt participatory approaches. Concerned actors from all sectors that influence or are influenced by the development and management water plans should be identified and involved in the processes. Thus to choose between different alternatives requires great capacities in term of decision making at different and interrelated levels. In this context, great potential exists for decision support systems (DSS) to enhance and support policy and decision making.

Due to the complexity of the issues at stake, the collaborative development and adoption of appropriate decision support tools can help defining comprehensive approach to water management where different and often competing needs are jointly addressed.

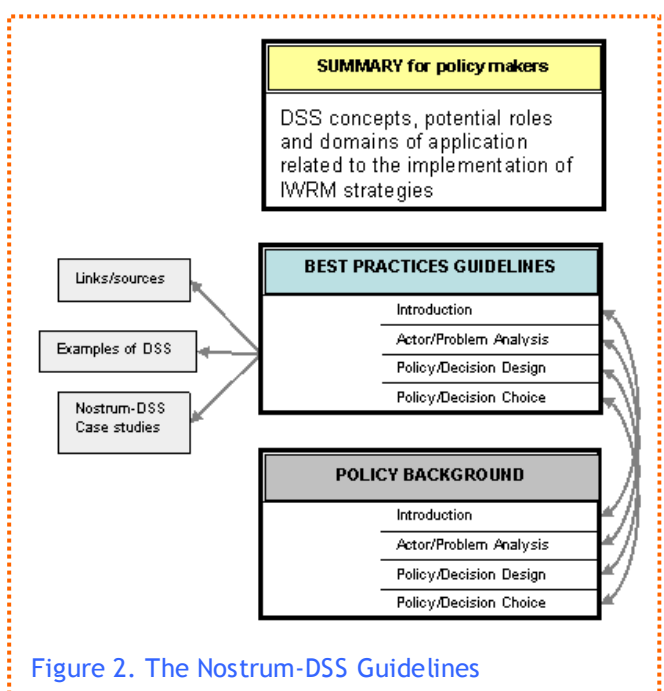


Figure 2. The Nostrum-DSS Guidelines

Therefore the development of DSS tools should be fully integrated in the decision making process and carried out in the correct methodological frameworks.

The decision making process starts with the examination of the state (both qualitative and quantitative) of the water resource in a river basin through the collection and organisation of data. This will form the preliminary base of information on which to build the subsequent phases of the decision process and develop the DSS tool for the ultimate formulation, evaluation and identification of equitable and effective water management strategies. The adoption of participatory approaches in water management help creating a common understanding amongst the different actors (i.e. governmental organisation, representatives of specific interest groups, local or national NGOs, trade unions and associations, representatives of the civil society and experts) at all levels (i.e. local, regional, national) and to increase the acceptance of the process outcomes.

Therefore the Nostrum-Dss guidelines are outlined on the main phases of a decision making process (see Figure 2) to provide general recommendation to guide the process and the integrated DSS tool development.

The Guidelines' aims and contents

The main purpose of the Nostrum-Dss Guidelines is to contribute to the improvement of water governance in the Mediterranean area by assisting stakeholders in the development of enhanced support tools. Furthermore, the Nostrum-Dss CA, through this document in particular, aim at filling the gaps between the demand of policy/decision makers and the methods and tools developed by the scientific community to support the different phases of the management of water resources. Users' needs emerging during the development of sustainable water policies and plan implementations, as well the obstacles towards the adoption of effective decision support systems for IWRM have been identified and analysed throughout the Nostrum-Dss activities and compared

with the existing international literature.

The main outcomes of those activities have been synthesised and phrased in the form of concise recommendations for the development and application of more effective DSS, which could be useful for both the scientific and the policy makers' communities. The former could find insights into the needs for operationalising the theoretical principles of IWRM, while the latter could find clarifications about what the approaches based upon the use of DSS tools can offer.

The Nostrum-Dss Guidelines are designed as an interactive tool

The main document is structured in three sections, as shown in Figure 2. The first section is a brief document targeted to policy makers and the lay public introduces to the contents of the Guidelines. This summary presents basic concepts, features and potential roles of DSS for water management to respond to the widespread lack of knowledge on the features and functions of DSS tools that was documented through the whole project implementation, especially in the southern countries of the Mediterranean area. The second section contains "Best Practices Guidelines (BPGs) for DSS design and implementation". It is designed as a set of practical checklists, providing good practice recommendations stressing the issues related to the improvement of decision support tools' development and use in the field of water

management. It responds in detail to perceived inadequacies concerning the development and the support offered by DSS for the accomplishment of a particular management task. The third section, "Policy Background", identifies policy targets and problem areas for the development and implementation of water policies or decision processes. Stakeholders' needs are listed here in terms of tasks to be accomplished or goals to be attained towards the implementation of the IWRM process.

The Guidelines represents the most important component of a concept of "meta-guidelines" developed by the Nostrum-Dss CA and described in the next section. In addition the guidelines are introduced by a short summary, also described below.

→ http://www.feem-web.it/nostrum/final_tech.php

More Nostrum-Dss Final Products

By FEEM, Nostrum-Dss Consortium

Meta-Guidelines

The Meta-Guidelines is a collection of projects outcomes and other material which have been developed to assist practitioners and policy makers by providing information and references for the development of enhanced IWRM plans, with specific focus on the use of DSS tools. The "meta" prefix identifies the emphasis placed on avoiding duplications of previous efforts (i.e. previously published guidelines, toolboxes, manuals, etc.), preferring instead to build upon

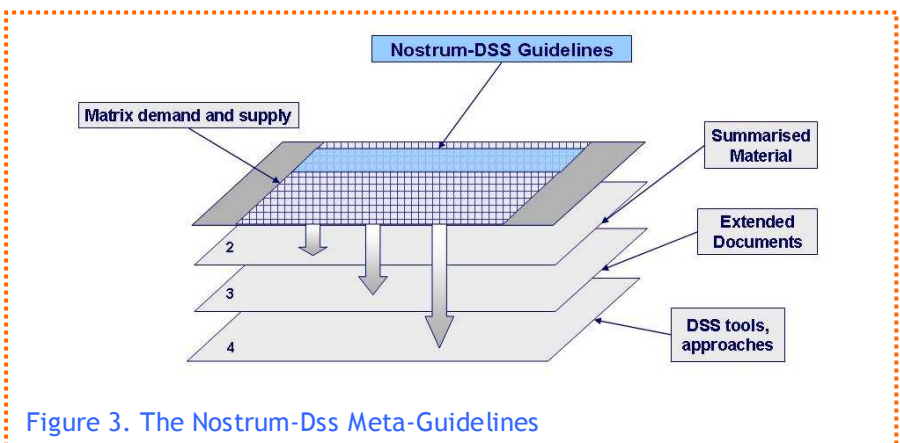


Figure 3. The Nostrum-Dss Meta-Guidelines

already existing materials and facilitating a guided access to available resources. The Meta-Guidelines are conceived as a 3D web based tool developed upon a series of layers in which products are displayed according to an increasing degree of detail and technical content (see the Figure 3):

- the **1st layer** represents the Meta-Guidelines interface which is designed as a demand and supply matrix in which the rows list the potential demand of stakeholders (e.g. water quality assessment, water allocation strategies) and the columns represent the different categories of the research products available. By clicking on the interactive matrix's cells, the user gains access to documents, tools and other sources of information both developed within the Nostrum-Dss project implementation and gathered through an ad-hoc review;

- the **2nd layer** gathers references of summarised material and other concise documents;

- the **3rd layer** extended documents, reports, guidelines and projects' deliverables on various aspects of water management and DSS tools are available;

- the **4th layer** consists of a database of approaches, models and DSS tools', including, for each item, a short description of the main features, the kind of support provided, case studies and applications.

→ http://www.feem-web.it/nostrum/final_policy.php#3

Meta-database

The Nostrum-Dss Meta-Database is a collection of relevant statistical and geographical data sources relative to water management in Mediterranean Area.

The main menu of this repository allows entering and browsing information about remote sensing and GIS institutes and organizations, and to search for information about the availability of statistical and Geographic Information System (GIS) data through a long list of organizations and institutions surveyed.

→ http://www.feem-web.it/nostrum/final_tech.php#3

IWRM Glossary

The Nostrum-Dss Meta-Glossary is a collection of relevant terms and sources pertaining to different disciplines and methodologies related to Integrated Water Resources Management (IWRM).

The html version of the glossary is available on the Nostrum-Dss web-site:
→ <http://www.feem-web.it/nostrum/glossary.php>

The Nostrum-Dss Leaflets

The Nostrum-Dss Leaflets Series includes the *Policy Leaflets*, the *Technical Leaflets* and the *Case studies Leaflets* series. The three series summarise and present the contents of the relevant scientific reports produced under the Coordination Action.

The **Policy Leaflets** include: "Multi-sectoral approaches to DSS uses in water management in the Mediterranean Area"; "Multi-disciplinary approaches to decision making and IWRM in the Mediterranean Area"; "Towards improved governance for IWRM in the Mediterranean Area"; "Social aspects of conflicting water uses in the Mediterranean Area"; "DSS and stakeholders participation in water management in the Mediterranean Area".

The **Technical Leaflets** include: "The glossary of IWRM terminology"; "The Meta-database Tutorial"; "Meta-Guidelines Tutorial"; "Decision making processes, regulations and laws"; "Development and implementation of DSS tools"; "Agent-based models".

The **case studies series** is designed to point out common best practices and pitfalls in the implementation of Integrated Water Resources Management (IWRM) strategies or plans in the Mediterranean countries. The series summarise the context and the main features of the water management processes investigated in Nostrum-Dss case studies, in the following countries: Algeria, Croatia, Cyprus, Egypt, Greece, Israel/Palestine, Italy, Lebanon, Morocco, Portugal, Spain, Syria, Tunisia and Turkey.

→ http://www.feem-web.it/nostrum/final_policy.php#2

The Nostrum-Dss Dissemination Strategies

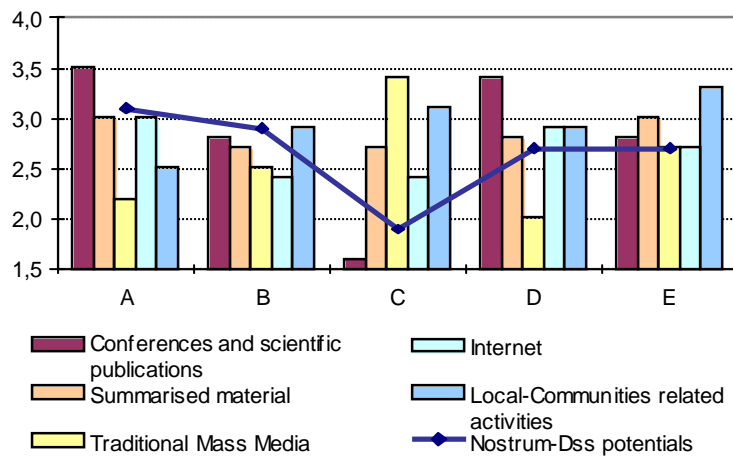
By Carlo Giupponi and Yaella Depietri
FEEM, Nostrum-Dss Consortium

The strategy for the dissemination of the project outcomes implemented throughout the CA was based upon the results of consultations with stakeholders and refined through the information gathered by means of ad-hoc questionnaires compiled by the Consortium members and policy makers invited to both the events of the last year - 3rd Thematic Workshop (20-21 December 2006 – Milan, Italy) - Science and Policy Workshop (15-16 February 2007 – Valenzano, Italy). In total 31 anonymous questionnaires were collected. First, participants were asked to express their opinions about the effectiveness of five different dissemination strategies: conferences and scientific publications, summarised material, traditional mass media, the internet, and local community-related activities. The alternative strategies were then confronted with the Nostrum-Dss general objectives (see A-E in legend in Figure 4).

As shown by the line on the Figure 4, in general the project is perceived to have high potential for the promotion of knowledge sharing (A), as well as for intensifying cooperation in the Mediterranean Area (B), with good potentials for objectives D and E, while limited expectations are for objective C, related to raising awareness of the general public.

When respondents were asked to define the expected effectiveness of the five dissemination strategies for the five objectives, a very diversified situation emerged.

Traditional scientific dissemination means were suggested to be employed for promoting knowledge sharing (A) and for training and capacity-building purposes about IWRM principles and the use of DSS tools (D). On the other hand, raising participation and awareness - for which a low potential is expected from the CA - should be accomplished through traditional mass media. Interesting to note, the Internet was never valued as the most



A	Promoting knowledge sharing and establishment of synergies within the Mediterranean research community
B	Intensifying links and cooperation between the science and policy spheres for the application of IWRM in the Mediterranean Area
C	Raising participation and awareness of the general public about sustainable water management
D	Training and capacity building about the IWRM principles and the use of DSS tools for policy making
E	Enhancing trust and credibility of the research community at local, national and international levels

Figure 4. Results of the survey on the effectiveness of the dissemination strategies to achieve project objectives.

appropriate tool, but with a relatively high potential for scientific knowledge sharing (A) and capacity building (D); while, when asked specifically about the suitability of the various dissemination strategies for the Nostrum-Dss products, Internet was considered the most suitable means to disseminate on average the Nostrum-Dss outcomes.

From the apparent contrast between the results of the general evaluations and those related to Nostrum-Dss, a comprehensive strategy was developed for the finalization and effective exploitation of the main final products. For the sake of brevity, the main results of the analysis are summarised in the following concluding remarks:

1. the two-way communication strategy between the stakeholders and the Consortium involved a relatively high number of people, but will not provide sufficient momentum for a significant impact of the CA after the completion of the work;
2. in order to overcome the cultural, linguistic and digital divides to

effectively and broadly reach the intended end-users and allow for an easy uptake of the project's outcomes, significant resources and follow-up activities are needed;

Dissemination is often limited by the lack of specific means for supporting maintenance and upgrading of the final project products after the completion of the research period

3. besides the usual dissemination channels of the scientific community (papers, conferences, etc.) the internet seems to be the only practicable strategy for a wider impact of the CA, first of all for its limited costs. This is in accordance with the report "EU-INCO water research from FP4 to FP6 (1994-2006) - a critical review", showing how almost all the Consortia of EU-INCO water research projects

prefer to disseminate information through the web,
 4. the adoption of appropriate modes of communication to facilitate a wider access to information is limited by the current EU funding scheme and, in particular, by the lack of specific means for supporting the maintenance and upgrading of the final project products after the completion of the research period.

In the attempt to overcome these limitations, the final Nostrum-Dss web-site was given the primary function of repository of the knowledge gathered during the implementation of the CA and the final products. The materials are thus available to be further adapted (e.g. translated into the local language) and locally disseminated through and beyond the net of relationships established during the project implementation. At the same time, parallel efforts are in progress to provide new and specific resources to implement the dissemination strategies described earlier. ❄

Events & News

Nostrum-Dss Final Dissemination Conference Larnaca (Cyprus), 25-27 Oct 2007

The Nostrum-Dss CA has continuously sought the opportunity to combine its activities with those of other projects in order to facilitate exchanges, mutual learning and more effective dissemination and exchange with related EU-funded projects. As for the last year the Third Nostrum-Dss Thematic Workshop was held at FEEM's venue in Milan, on December 20-21 2006, in parallel to the OPTIMA 4th Management Board Meeting and of the Nostrum-Dss Science and Policy workshop was held in parallel with the Final WASAMED Conference (Feb 2007, Bari, Italy) previously described in this newsletter.

The Nostrum-Dss Final Dissemination Conference will be held at the LORDOS Beach Hotel in Larnaca, Cyprus, on October 25-27 2007.

The first day meeting will be

organized in collaboration with the EU-funded **INECO project**, (<http://environ.chemeng.ntua.gr/ineco/>). The INECO Coordination Action, officially launched on July 1st 2006, discusses shared problems in the water management decision-making process and the deficiencies of the present governance structures around the Mediterranean Basin. During 2007, INECO is planning a series of Stakeholder Workshops in Cyprus, Egypt, Lebanon, Syria, Tunisia, Algeria and Morocco. The workshops' objective is to encourage constructively engaged Integrated Water Resources Management, and lay the foundations for reaching a common understanding among researchers, local stakeholders and end-users on what the real problems are and how these could be addressed in a common vision of resources management.

The Nostrum-Dss Final Conference will then pursue on the 26th October with the presentation and discussion of the Nostrum-Dss main results worked out during the project implementation to end on the 27th October on which day a field trip is organised.

25th Oct 2007 Nostrum-Dss and INECO Joint Event

"IWRM through coordination, dissemination, and exploitation of research outcomes"

The Nostrum-Dss and INECO joint event, organised by the Agricultural Research Institute (ARI) (Cyprus) and the Water Development Department, Ministry of Agriculture, Natural Resources and the Environment (Cyprus), is expected to be an excellent opportunity for strengthening synergies between EU research projects. The objective of this joint event is to involve a larger number of researchers and other interested participants to benefit from the meeting as an opportunity to exchange scientific knowledge and projects' results on different topics related to the water resources management domain in the Mediterranean region. The main theme of this open session will be oriented to the discussion of problems and criteria for the coordination, dissemination

and exploitation of EU-research outcomes related to IWRM in the Mediterranean region.

Participation

Coordinators of related EU projects have been contacted to call for their potential interest to participate to an open session and present the results of their projects. At present we have received positive replies for participation in this open workshop from various projects including:

- **DIMAS** "Deficit Irrigation for Mediterranean Agricultural Systems"
<http://www.uco.es/investigacion/grupos/agr119/dimas/html/dimas.html>
- **GEWAMED** "Mainstreaming Gender Dimensions into Water Resources Development and Management in the Mediterranean Region"
<http://www.genderandwater.org/>
- **ISIIMM** "Institutional and Social Innovations in Irrigation Mediterranean Management"
<http://www.isiimm.agropolis.org/>
- **MEDITATE** "Mediterranean development of innovative technologies for integrated water management"
<http://www.meditate.hacettepe.edu.tr/index1/index.htm>
- **MEDROPLAN** "Mediterranean Drought Preparedness and Mitigation Planning"
<http://www.iamz.ciheam.org/medroplan/>
- **MELIA** "Mediterranean dialogue on integrated water management"
<http://www.meliaproject.eu/>
- **WASAMED** Thematic Network on Water saving in Mediterranean agriculture
<http://wasamed.iamb.it/programmi/home.php>

Expected outcomes

The discussions about the coordination, dissemination and exploitation of EU-research outcomes related to IWRM and the Mediterranean region should lead to the development of a brief discussion document on the following aspects:

- concrete ideas about how to coordinate dissemination activities of different projects in order to reach a

critical mass of products to be delivered to potential end-users;

- strategies for combining the activities of projects with different timing with the aim of supporting the maintenance of a common stream of actions;
- strategies to expand the collaboration outside the range of projects that will be represented in Cyprus;
- strategies for improving the effectiveness of future EU-founded research.

26th Oct 2007

The Nostrum-Dss Final Conference

The conference is the concluding event of the Nostrum-Dss CA aiming to establish long term relationships and disseminate project results. The objectives of the Conference are indeed the:

- finalization of the project's products and of the dissemination and communication strategies to be adopted;
- dissemination of the project's results outside the Nostrum-Dss Consortium;
- overall presentation of the Nostrum-Dss attainments achieved during the implementation of the project activities, as scheduled for each of the work-packages;
- planning of final activities;
- future perspectives in relation to partners' activities.

For more details visit:

→ <http://www.feem-web.it/nostrum/forum/viewtopic.php?t=13>

What's new

Besides the Nostrum-Dss final products extensively presented in the former section of these newsletter, the project's website also hosts the outputs of the events held during all the CA implementation, the deliverables and the scientific publications drafted:

→ http://www.feem-web.it/nostrum/downloads_index.php

Publications

All the articles presented within the Science and Policy Workshop have been published in the Conference proceedings: WASAMED, OPTIONS méditerranéennes - Series B: Studies and Research, n. 56, session IV

For the presentations see session 4 at:

→ <http://wasamed.iamb.it/programmi/workshop.php>

For the full articles see at:

→ http://wasamed.iamb.it/project_publications/SessionIV.pdf

Abu-Zeid K. and O. Elbadawy, 2007. *A Gis-Based Water Resources Information System: A Regional Dss for IWRM.*

Bellouch, H., A. Baroud, M. Taoura and B. Sirat, 2007. *Pilotage de l'irrigation par la Methode Durayonnement Global.*

Cherkaoui, H.D., R. Moussadek and H. Sahbi, 2007. *Apport des Techniques Geo-Spatiales pour la Caracterisatio de la Qualite des Eaux Sous-Terraines des Oasis de la Vallee Du Draa- Cas de la Nappe de Fezonata.*

Crimi, J., M. Khawlie, M. Awad, A. Sgobbi and C. Giupponi, 2007. *Availability And Accuracy of Mediterranean Databases Relevant to Agricultural Water Uses.*

Fassio, A., C. Giupponi, A. Sgobbi and J. Mysiak, 2007. *Application of the Netsymod Approach in Support of Decisions About Irrigation Management,*

Gharsallah, O., I. Nouri, F. Lebdi and N. Lamaddalena, 2007. *Use of the Genetic Algorithm for the Optimal Operation of Multi-Reservoirs on Demand Irrigation System.*

Giupponi, C., Y. Depietri, R. Camera, J. Crimi and A. Sgobbi, 2007, *The Nostrum-Dss Guidelines for Improved Development and Adoption of Decision Support Systems in Integrated Water Resources Management in the Mediterranean Basin.*

Hoff, H., C. Swartz, D. Yates and K. Tielborger, 2007. *Water Management Under Extreme Water Scarcity: Scenario Analyses for the Jordan River Basin , Using WEAP21.*



Lipchin C., 2007. *A Framework for Multi-Criteria Decision-Making with Special Reference to Desalination in the Mediterranean.*

Moneo, M. and A. Iglesias, 2007. *A Framework for Irrigation Management During Drought: Application in two Case Studies in the Tagus Basin , Spain .*

Sgobbi, A. and C. Giupponi, 2007. *Models and Decision Support Systems for Participatory Decision Making in Integrated Water Resource Management.*

Tzima, F.A., I.N. Athanasiadis and P.A. Mitkas, 2007. *Agent-Based Modelling and Simulation in the Irrigation Management Sector: Applications and Potential.*

Other publications

Abu-Zeid, K and Afifi, S. 2006. *Multi-Sectoral Uses of Water & Approaches to DSS in Water Management in the Nostrum Partner Countries of the Mediterranean.* FEEM Working Paper n° 100/06.

Giupponi, C., J. Mysiak and J. Crimi, 2006. *Participatory approach in decision making processes for water resources management in the Mediterranean Basin.* FEEM Working Paper n°101/06.

Lipchin, C. 2006. *A Future for the Dead Sea Basin: Water Culture among Israelis, Palestinians and Jordanians* FEEM Working Paper n. 115/06

Sgobbi, A.; Fraviga G. 2006. *Governance and water management: progress and tools in Mediterranean Countries.* FEEM Working Paper 151/2006

Minoia, G., 2007. *Gender Issue and Water Management in the Mediterranean Basin, Middle East and North Africa.* FEEM Working Paper n. 49/2007

Minoia, P. and A. Brusarosco, 2006. *Water Infrastructures Facing Sustainable Development Challenges: Integrated Evaluation of Impacts of Dams on Regional Development in Morocco.* FEEM Working Paper n. 105/2006

To download these articles visit:

→ http://www.feem-web.it/nostrum/downloads_pub.php

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Do you want to know more?

If you want to know more about Nostrum-Dss Project please e-mail the Coordinator at nostrum@feem.it or visit the project web site <http://www.nostrum-dss.eu/>