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Dissemination Report



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1. EXECUTIVE SUMMARY

The overall objective of the SMART project is to develop, implement and test a new, participatory but scientifically rational approach to planning and management of the coastal zone that can help to reconcile conflicting demands on scarce water. In essence, the project is concerned with testing a strategy for solving water demand conflicts.

Nine countries, seven of which from the Mediterranean region, have actively participated in the implementation of the SMART project. In particular, Turkey, Lebanon, Jordan, Egypt and Tunisia have been involved in the general methodological and comparative analytical work packages of the project and have had their primary responsibilities in carrying out their respective case studies. Austria, France, Italy and Portugal have supported the management and the execution of the SMART project providing different kind of collaboration, such as covering both the socio-economic domain and its research methods, with emphasis on resource economics and sustainable development, as well as quantitative, numerical methods of analysis and resource engineering.

At the conclusion of the SMART project, any single partner has elaborated a dissemination report containing a detailed summary on the activities carried out during the three year period of the project. Such dissemination reports mainly consist of three parts:

- (a) *status* of the dissemination activities of the project (description of the dissemination activities carried out since the beginning of the project);
- (b) future plans for disseminating the results of the project (indication on how, after the conclusion of the project, the partners intend to continue the dissemination process and to publish the outcomes of the project);
- (c) feedback (indication of the feedbacks, if any, received from the local stakeholders, relevant institutions, organisations, scientific or public community and individuals).

The dissemination reports of all the above mentioned partners have been collected in this document.

2. ESS, AUSTRIA

a. *Dissemination activities*

ESS has maintained the project web server as primary channel for the dissemination of the project results and related information, and has also acted as the organizer and moderator of the discussion forum. The last October 2003, ESS submitted a paper in collaboration with CEDARE on coastal GIS in order to participate at the coastal GIS conference in Genoa. The paper was been accepted for oral presentation in the first plenary session. In October 2004, ESS participated at the International Hydro Informatics Conference, presenting a paper on the SMART project.

Moreover, ESS has been very active in the realization of several project related publications and conference participations such as:

Fedra, K.

Water Resources Modelling at the River Basin Scale (tutorial, accepted for presentation).

Submitted and accepted at: IASTED/SMO 2005, Oranjestad, Aruba, August 2005.

[on-line description](#)

Fedra, K.

Water Resources Simulation and Optimization: a web based approach.

Submitted and accepted at: IASTED/SMO 2005, Oranjestad, Aruba, August 2005.

[on-line paper](#)

Fedra, K. & Harmancioglu, N.

A web-based water resource simulation and optimization system.

Submitted and accepted at: CCWI 2005, Exeter, September 2005.

[on-line abstract](#)

[on-line paper \(PDF\)](#)

Fedra, K.

Water Resources Management: tools for a participatory planning and decision making process.

Submitted and accepted at: WATMED-2, Marrakech, Morocco, November 2005.

[on-line abstract](#)

b. *Foreseen activities*

As foreseen activities ESS will continue the maintenance of the project web server including stakeholder and issues data bases which will be opened for global access and additions as well as some built-in analysis and benchmarking tools, and on-line modeling tools/demos beyond the project duration. ESS will be also in charge for the conversion of Deliverables and data bases/model results into an on-line interactive e-Book, and lastly will use the results for various upcoming conferences, e.g., IASTED 2006 in Botswana.

c. Feedback

The public project web server receives a considerable number of visitors regularly. On average, ESS observes more than 1,000 unique visitors (with approximately twice that number of visits suggesting a high number of repeat visits!) per month. This also includes guest users exploring the on-line model tools and data bases. ESS has also received several queries about applying SMART methodology from other countries in Asia, Africa, and Latin America. Since ESS was not responsible for any case study, it did not receive any direct feedback from local stakeholders. Some other feedback could be received after the publication of the project results.

3. SOGREAH, FRANCE

a. Dissemination activities

The primary dissemination strategy, adopted by SOGREAH during the whole duration of the project, was mainly based on the organization of national and international meetings. In particular, during the first year of the project, the following meetings have been organized:

- 13-15 June 2003, SMART Meeting in Beirut, (NCRS) Lebanon. Participants: C. Freissinet, P. Sauvaget.
- 5-7 August 2003, Meeting with the Lebanon Water Secretary (Ministry): presentation of the SMART project and discussion on the environmental issues in Lebanon by Mr. Patrick-Yann Dartout from SOGREAH.
- 19-28 August 2003, TELEMAC Training in Grenoble, (SOGREAH) France. This training was organised by SOGREAH in order to teach to the different partners in charge of the TELEMAC modelling part how to use the TELEMAC software (construction, calibration and validation steps for both hydrodynamic and water quality issues). The meeting was attended by Catherine Freissinet, Martine Monteil, Géraldine Cara, Pierre Lang, Yvon Mensencal, Claude Guilbaud.
- 19-21 September 2003, SMART Meeting in Izmir, Turkey. Participants: C. Freissinet, Y. Mensencal.
- September 2003, Meeting in Paris, France with FFEM (Fonds Français pour l'Environnement Mondial) in Paris (French GEF). Presentation of the SMART project. Participants: C. Freissinet, Patrick-Yann Dartout.

The second year the following events took place:

- On 9 February 2004, TELEMAC Session with Jordan Partners, in Amman, Jordan. This TELEMAC session organised by SOGREAH at the University of Amman focused on the validation of the Jordan case study and the definition of their hydrodynamic and water quality scenarios. Participants: C. Freissinet, Y. Mensencal.

- 11-13 February 2004, SMART Meeting in Aqaba, Jordan. Participants: Catherine Freissinet, Y. Mensencal.
- 28 June - 2 July 2004, International Water Symposium in Cannes, France: "Gestion Durable des Ressources en Eau en zone Côtière - SMART Sustainable management of scarce resources in the coastal zone" by Catherine Freissinet, Zain Al-Houri, Yvon Mensencal, Muhammad Shatanawi. Oral presentation at the Symposium and paper in the symposium book.
- 11-15 September 2004, SMART Meeting in Hammamet, Tunisia. Participants: Catherine Freissinet, Yvon Mensencal.
- On 16 September 2004, TELEMAT Session with Tunisian Partners, organized in Tunis, Jordan. This TELEMAT session organised by SOGREAH at the CNT-Tunis focused on the validation of the Tunisian case study and the definition of their hydrodynamic and water quality scenarios. The meeting was attended by Catherine Freissinet, Yvon Mensencal.

The last year, the two following meetings:

- 12-14 January 2005, TELEMAT Meeting in Grenoble, France. This TELEMAT meeting organised by SOGREAH focused on the validation of the TELEMAT and SUBIEF scenarios, the validation of the different scenarios and the validation of the draft TELEMAT report (all the TELEMAT modellers were invited to this meeting but only the Lebanese and Tunisian modellers participated to it). The meeting was attended by Catherine Freissinet, Yvon Mensencal.
- 17-18 January 2005, SMART Meeting in Grenoble, France. Participants: Catherine Freissinet, Yvon Mensencal, Jean-Marc Usseglio, Patrick Sauvaget, Martine Monteil, Amandine Mutet.

In addition to the above mentioned events, SOGREAH published two articles.

The first one, in July 2004, entitled "*SMART - The Mediterranean, a life-size laboratory*" published in the SOGREAH International Letter. The article has been sent by e-mail to more than 1000 governmental and private institutes around the world.

The second article, titled "*Mediterranean basin - SMART*", was published in the Network Newsletter of the INBO (International Network of Basin Organizations) in English, Spanish and French version. Reference: article n. 13, December 2004 - January 2005.

b. Foreseen activities

As foreseen activity the SOGREAH has planned to write a paper with the Lebanese Team (NCRS) dealing with their TELEMAT application on the Lebanese case study. The journal has not been chosen yet.

c. Feedback

SOGREAH was not responsible for any case study so it did not receive any direct feedback from local stakeholders or other institutions. Some feedback could be received after the publication of the project results.

4. FEEM, ITALY

a. Dissemination activities

FEEM assisted all the partners with the preparation of SMART folders, leaflet, and brochure helping with the format, main contents, setting the number of pages and the number of copies decided by the group.

Besides FEEM contributed to create the common data base and the list of potential receivers of the folders, including the relevant thematic networks in which FEEM has been involved and potential end-users of the project's results, other than those of the case studies.

Based on its own extensive international networks, FEEM provided information to all partners about international meetings and conferences dealing with water resource management with the purpose of submitting scientific papers.

FEEM presented a two-yearly presentation of the SMART project in the FEEM Newsletter. In particular, since the beginning of the project in August 2002, the SMART project was circulated in 6 FEEM Newsletters (n. 2 of 2002, n. 1 of 2003, n. 2 of 2003, n. 1 of 2004, n. 2 of 2004 and n. 1 of 2005). FEEM Newsletter was sent to 647 institutions in Italy and to 497 institutions abroad.

Furthermore the project SMART was mentioned in the Newsletter "Venezia Laboratorio di Cultura" (at the number 02 of 2002 and at the number 03 of 2003), both presented at the "Salone dei Beni Culturali" of Venice, held respectively in 2002 and 2003. Information about the SMART project was also presented on the project website "Venezia Laboratorio di Cultura", coordinated by the Venice Municipality.

b. Foreseen activities

In the near future, FEEM envisages to publish two working papers within the FEEM series. The first one will focus on the outcomes of the Work-package 01 Requirements and Constraints Analysis which was completed during the first six months of project implementation. The second paper will, instead, presents FEEM contribution to Work-package 10 Comparative Analysis which was mainly under EIA/UATLA responsibility. Preliminary results on the Comparative Analysis were presented at the final meeting of the SMART project held in Venice 22-23 June 2005.

c. Feedback

FEEM was not responsible for any case study so it did not receive any direct feedback from local stakeholders or other institutions. Some feedback could be received after the publication of the project results.

5. UATLA, PORTUGAL

a. Dissemination activities

The dissemination activity undertaken by UATLA started in January 2003 with the making up of the UATLA Web site (Atantica University), that explained and resumed the SMART project in Portuguese and English version. Also, since January 2003, the TEnD Web site (Thematic Group about Territory Environment and Development) has started with the same purpose to resume the project. The TEnD Web-site has been performed only in English version.

In March 2004 an international conference was held in Guangzhou, China, entitled: "Management policies for priority water pollutants and their effects on foods and human health. The feedback mechanisms between social and natural systems: the problem of time scales".

In June 2004 the ESRI Users meeting took place in Lisbon, Portugal. The meeting was focused on "The use of GIS technology to support the Water Demand Projections".

In July 2004, a conference held in Trondheim, Norway was organized. The conference was entitled: "XI World Congress of Rural Sociology. The role of socioeconomic and policy aspects to understand water scarcity". Rural territory, environment and governance.

In November 2004 the GIS National Conference took place in Oeiras, Portugal. The conference main subject was: "The use of GIS technology to support the Water Demand Projections".

b. Foreseen activities

To spread the results of the project, as future dissemination activities, UATLA foresees to organize the next December 2005, a conference having as main subject the "Public Policies and Sustainable Development in Conferences of University Atlantica. Comparative Analysis of Water Policies in Middle East countries according to the WFD". The conference will be held in Barcarena, Portugal in Portuguese and English languages.

In March 2006, a paper in English version on the Scientific International Journal titled "*Water managed and the differences in implementation policies in Middle East and Mediterranean: the example of five water shortest countries*" is forthcoming.

c. Feedback

UATLA was not responsible for any case study so it did not receive any direct feedback from local stakeholders or other institutions. Some feedback could be received after the publication of the project results.

6. SUMER, TURKEY

a. Dissemination activities

Throughout the project duration, SUMER has carried out various types of dissemination activities at local, regional, national and international levels. Some of these activities relate to the SMART methodology, some to the Turkish case study and some to stakeholder involvement in different phases of the project. Such dissemination activities are summarized as follows:

Dissemination activities at local level

The following dissemination activities are carried out in the case study area (the city of Izmir and the Gediz River Basin):

The SMART framework was presented to the State Hydraulic Works (DSI) authorities at the DSI regional office in Izmir (April 2003). The project was welcomed with interest, and as a result of this meeting, DSI provided SUMER with all data relevant to the case study area.

SMART objectives, methodology and the Turkish case study were presented at the Local Agenda 21 meeting held by the Metropolitan Municipality of Izmir (July 2003). All local stakeholders participated in this event; and since the meeting was open to public, it was possible to disseminate information on SMART to a fairly large audience.

The coastal modelling issues covered by SMART were presented to the İzmir Municipality Consultant Mr. Mehmet Gulay, and modeling of the Izmir Bay via SMART analytical tools (namely, TELEMAC modeling system) was discussed (August 2003).

WRM / RRM Modeling Workshop on WaterWare applications was held in Izmir between December 9-10, 2004. Officers of the DSI regional office also participated actively in this workshop and ran their own scenarios, using the WaterWare system.

A meeting was held at the Water Supply and Sewerage Administration (IZSU) of the Metropolitan Municipality of Izmir on TELEMAC and WaterWare Modeling, which were demonstrated to IZSU authorities upon their request (January 2005). As a result of this meeting, IZSU indicated the intent to develop specific projects on Izmir Bay and the Gediz river basin. Accordingly, SMART project coordinator DDr. Kurt Fedra and SUMER developed new project proposals for IZSU, which are still in the negotiation phase.

The following lectures on the SMART project were given by SUMER team leader, Dr. N. Harmancioglu at various local meetings:

“Sustainable Development and Water Resources”. Turkish Chamber of Civil Engineers, Izmir Division, Panel on “Sustainable Development and Water Resources”, March 25, 2004, Izmir.

“Sustainable Development and Water Resources”. DSI II. Regional Directorate, World Water Day on Water and Disasters, March 22, 2004, Izmir.

“Water in the 21st Century”. Turkish Chamber of Civil Engineers, Izmir Division, Symposium on Water, May 9, 2003, Izmir.

A M.Sc. thesis was supervised by Dr. Harmancioglu on database development in the case study area, (KIRATLI, B., 2003, *Development and management of stream flow databases for watershed studies*. Izmir, Dokuz Eylul University, Graduate School of Applied Sciences, Civil Engineering Program, M.Sc. Thesis on Hydrology and Water Resources).

Dissemination activities at regional level

The major event at the regional level was the organization of a Stakeholder Meeting on December 8, 2004, which brought together local municipalities, NGOs, DSI Regional Office in Izmir and the Provincial Directorate of the Ministry of Environment and all other public and private water agencies. About 120 stakeholders in the case study region (Izmir and the Gediz river basin) participated in this meeting through invitation by SUMER. Problems and management policies relevant to the case study area were discussed in depth by the contribution of all stakeholders.

The Stakeholder Meeting of December 2004 resulted in the development of a stakeholder database, which is currently available on SMART website held by the coordinator.

Again at the Stakeholder Meeting of December 2004, SMART Project coordinator, DDr. Kurt Fedra gave a lecture on “Water Resources and Coastal Zone Management: Methods, Tools and Experiences from EU Projects”, which initiated interesting discussions among the audience.

Brochures were prepared for the project in English and Turkish and distributed not only to all the stakeholders at the above meeting, but also to national authorities and agencies (December 2004). Electronic copies of these brochures are attached to the end of this report.

Questionnaires on water issues were prepared in Turkish and submitted to all stakeholders in the database (January 2005). The results of these questionnaires are also available on SMART website and can be reached online.

Dissemination activities at national level

The SMART framework was presented to the State Hydraulic Works (DSI) authorities at the DSI General Directorate in Ankara through a 3-hour seminar in May 2003. The general director of DSI and all administrative officers at the headquarters attended this seminar. DDr. Kurt Fedra also attended this meeting and contributed with a lecture on SMART methodology and examples from the Turkish case study. As a result of this meeting, a senior DSI officer got involved in SMART as an observer for project developments. She attended all SMART meetings in Turkey and the 5th Management Board Meeting in Grenoble (France) in January 2005.

Information on the project was also provided to the Ministry of Environment and Forestry in December 2004 by sending SMART brochures to various departments of the Ministry. A project on the management of the Gediz river basin has been also initiated by the Ministry in 2005; and within this context, the Ministry has included the SMART project in its agenda as one of the projects on Gediz, that needs to be closely followed and observed. The Ministry has requested that SUMER provides the results of the Gediz case study.

The Ministry of Environment and Forestry held a workshop in Izmir in July 2005 on the Gediz delta and wetland region. SMART project was also presented at this workshop, as a result of which 6 new projects were identified on Gediz management and SUMER is declared to be one of the major institutions to develop these projects.

In May 2005, DSI, SUMER and ESS jointly submitted a project proposal to TUBITAK (the Scientific and Technical research Council of Turkey), which will implement SMART methodology in the Euphrates-Tigris Basin, which is the largest river basin in Turkey.

The following 2 articles related to the SMART project were published in the special issue of the journal of the Turkish Chamber of Civil Engineers:

1. HARMANCIOGLU, N.B.; GUL, A.; FISTIKOGLU, O.; (2002-2003): Integrated Water Resources Management (in Turkish), Turkish Chamber of Civil Engineers, Journal of Engineering Developments, special issue on Water, year: 47/2002-3, No. 419, pp. 29-39.
2. OZKUL, S.D.; BARAN, T.; HARMANCIOGLU, N.B. (2002-2003): Institutional Aspects of Water Resources Planning and Management. Turkish Chamber of Civil Engineers, Journal of Engineering Developments, special issue on Water, year: 47/2002-3, No. 419, pp.48-51.

Another stakeholder meeting was held at the General Directorate of State Hydraulic Works (DSI), in Ankara with the contribution of DDr. Kurt Fedra, Dr. Nilgun B. Harmancioglu and Dr. Okan Fistikoglu in October 2004. The major issues discussed at this meeting were the possibilities of developing joint projects with DSI on Gediz management and database development, based on experiences in the SMART project.

Nilgun B. Harmancioglu presented an invited paper on "Sustainability Criteria in Water Resources Management" at the 4th National Hydrology Congress, Istanbul, 23-25 June 2004 (Proceedings, pp. 9-18).

Dissemination activities at international level

The following lecture was given by SUMER team leader, Dr. Harmancioglu, in 2003 at FEEM:

HARMANCIOGLU, N.B. (2003): *"The Case Study of the Gediz River in Turkey in the context of the "SMART" Project on Sustainable Management of Scarce Resources in the Coastal Zone"*. Fondazione Eni Enrico Mattei (FEEM), March, 2003, Venice, Italy.

SMART brochures in English have been distributed at every international meeting attended by SUMER personnel.

SUMER organized the EWRA (European Water Resources Association) Symposium on Water Resources Management: *"Risks and Challenges for the 21st Century in Izmir"*, Turkey, between 2-4 September, 2004.

The following papers relevant to the SMART project were presented at the Symposium by the SUMER team:

“Determination of Social and Economical Indicators for Future Water Use Scenarios in Gediz River Basin” by C. P. Çetinkaya, F. Barbaros & H. Gundogdu.

“Utilization of Geo-information Tools in Water Management Studies” by G. Onusluel & A. Gul.

“The Need For Integration in Environmental Data Management” by N. Harmancioglu, P. Geerders, O. Fistikoglu & S. Ozkul.

Ali Gul from the SUMER team made a poster presentation on “SMART- Sustainable Management of Scarce Resources in the Coastal Zone” at the Eco-Imagine Opening Conference on GI & GIS for Integrated Coastal Management, held in Seville (Spain) between May 13-15, 2004.

The following publications are realized by members of the SUMER team:

1. MURRAY-RUST, H.; ALPASLAN, N.; HARMANCIOGLU, N.B.; SVENDSEN, M. (2003). Growth of water conflicts in the Gediz Basin, Turkey. Proceedings, ICID, “54th International Executive Council, 20th European Regional Conference on Consensus to Resolve Irrigation and Water Use Conflicts in the Euromediterranean Region”, September 14-19, 2003, Montpellier, France.
2. HARMANCIOGLU, N.; CETINKAYA, C.P.; GEERDERS, P. (2004): Transfer of Information Among Water Quality Monitoring Sites: Assessment by an Optimization Method. Proceedings, “Environ-Info - Conference 2004, 18th International Conference Informatics for Environmental Protection”, Track 1: Sharing Environmental Knowledge, Session: PS-11.
3. SVENDSEN, M.; MURRAY-RUST, H.; HARMANCIOGLU, N.B.; ALPASLAN, N. (2005): Governing closing basins: the case of the Gediz River in Turkey. In: *Irrigation and River Basin Management, Options for Governance and Institutions* (ed. By M. Svendsen), CABI Publishing, ch.11, pp. 193-213.

b. Foreseen activities

Scientific:

Papers will be published in SCI-cited journals on the Turkish case study, comprising the following topics:

- Institutional, legal and environmental aspects of water management in the Gediz Basin – issues of sustainability;
- Socioeconomic analysis and scenario development for sustainable management of the Gediz river basin;
- Application of land use change models in the Gediz river basin and Izmir Bay;
- TELEMAC modeling studies in Izmir Bay;
- WaterWare applications in the Gediz basin and scenario analysis;
- Sustainability of the irrigation systems in the Gediz river basin.

Two papers have been submitted to the 2nd Mediterranean Conference, WATMED2, to be held in Marrakech, Morocco, between November 14-17, 2005:

- Simulation of Water Demand/Supply Scenarios in Gediz River Basin, Turkey (C.P. Cetinkaya & N.B. Harmancioglu);
- Sustainability Issues in a Mediterranean River Basin: the Case of the Gediz in Turkey (N.B. Harmancioglu & Y.Dalkilic).

These papers have been accepted for presentation at the Conference.

Two students are preparing their Ph.D. theses on subjects that use the SMART methodology: the first one deals with multi-criteria analysis for sustainability in the B. Menderes basin in Turkey; the second one particularly focuses on the DPSIR approach.

Public benefit:

The Stakeholder Meeting of December 2004 will be repeated in October 2005 to disclose the results of the SMART project to all local and regional stakeholders contacted earlier. To the same end, a workshop will be organized in Ankara in November 2005, where the completed project will be presented to water authorities at the national level. A booklet on the Turkish case study will be produced and distributed to all local, regional and national stakeholders. This will be in support of currently running projects on the Gediz river basin and the Izmir Bay.

Development of new projects:

As noted above, in May 2005, DSI, SUMER and ESS jointly submitted a project proposal to TUBITAK (the Scientific and Technical research Council of Turkey), which will implement SMART methodology in the Euphrates-Tigris Basin, which is the largest river basin in Turkey. If the proposal is accepted, this project will be accomplished in a period of 3 years.

The Ministry of Environment and Forestry held a workshop in Izmir in July 2005 on the Gediz delta and wetland region. As described earlier, the SMART project was also presented at this workshop, as a result of which 6 new projects were identified on Gediz management and SUMER is declared to be one of the major institutions to develop these projects.

As a result of the above workshop, the Ministry of Environment and Forestry, SUMER and ESS have agreed to submit a joint proposal on operational management of the Gediz basin to the EU LIFE Program, for which the deadline is the 31st October 2005.

c. Feedback

At present, all stakeholders at local, regional and national levels indicate their interest in receiving the outputs of the case study achieved by SUMER in the SMART project. This is why SUMER is preparing to hold two workshops (local and national) and disseminate booklets of the final case study report. Among the public authorities, particularly the Ministry of Environment and Forestry at the national level and the Water Supply and Sewerage Administration (IZSU) of the Metropolitan Municipality of Izmir at the local level expect to extensively make use of the results of the Turkish case study. They have expressed their high interest in the comparative analysis on management scenarios and their future impacts on water stress in both the Gediz basin and the Izmir Bay.



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 Project web site : <http://www.ess.co.at/SMART/>

The coastal zones of the Mediterranean are undergoing rapid development with growing and conflicting demands on the natural resources, and at the same time subject to often irreversible degradation of these resources and thus the very basis for development.

Water resources and the related land use issues are a key element for the sustainable development of coastal regions. They illustrate the dependency of the usually dynamic and fast growing coastal areas on their resource catchment. This project will explore methods and tools for long-term policy analysis and strategic decision support for integrated coastal development with special emphasis on water resources and land use, and the resource balance between the coastal region and inland areas.

The approach is based on a multi-sectoral integration of quantitative and qualitative analysis, combining advanced tools of quantitative systems engineering using numerical simulation models, with methods of environmental, socio-economic and policy impact assessment using rule-based expert systems technology and interactive decision support methods.

Water resources modeling including both quantitative and qualitative aspects will provide the framework for policy scenarios, exploring different development strategies, the consequences and implications of demographic, socio-economic, and technological development, and the interaction of these driving forces towards long-term sustainability of the coastal regions and their hinterland.

Aiming to support a participatory approach to policy making and impact assessment, the approach also foresees the extensive use of the Internet to facilitate broad participation and a shared information basis to empower the various actors and stake-holders in the decision making process, contributing to the development of a civic society. The integration of advanced quantitative methods and models with qualitative assessment aggregated into policy relevant indicators of sustainable development will add scientific rigor to the interactive and participatory political process. This will make it possible to focus the debate on policy issues, objectives and values rather than the underlying physical based data and information describing better quantifiable constraints and dependencies of the physical world.

A common methodology for policy design, evaluation, and decision-making will be developed and tested in a set of parallel case studies in each of the participating Mediterranean countries, and compared with the corresponding EU policies. SMART brings together partners from Turkey (DEU SUMER-Water Resources Research Center, Dokuz Eylul University), Lebanon (NCRS, National Centre for Remote Sensing), Jordan (Faculty of Agriculture, University of Jordan), Egypt (The Institute of Graduate Studies and Research (IGSR)), Tunisia (Centre National de Teledetection), Italy (Fondazione Eni Enrico Mattei), France (SOGREAH consulting branch/LHF division), Portugal (EIA, S.A., UATLA-Universidade Atlantica), and Austria (Environmental Software & Services GmbH). Lessons from the comparative analysis of these case studies will help to ensure a generic and generally applicable methodology, and at the same time help to foster inter-regional contacts and the exchange of experience.

The approach rests on four main and iterative steps:

- Socio-economic analysis to define problem issues, objectives and constraints, and the network of actors involved; this should identify for the case study areas the main problems of coastal zone development, and water resources management in particular, together with a set of potential policy instruments that may redress these problems towards an overall policy objective of sustainability, which implies economic efficiency and distributional equity.
- Quantitative analysis of the biophysical resource system, based on numerical simulation of policy scenarios identified and defined in the previous step; this includes an economic assessment of the costs and benefits of water use and supply (expressed as net present value) driven by overall development trends and land use change. The numerical analysis tools include:
 - ✓ A hybrid expert system with embedded GIS functionality and spatial analysis and decision support extensions using a discrete multi-criteria approach;
 - ✓ A river basin scale water resources modeling system, [WaterWare](#);
 - ✓ A detailed 3D dynamic flow and transport modeling system, TELEMAC.
- Assessment of these scenarios in terms of the criteria and against the objectives defined in the socio-economic analysis; this extends the basic monetary assessment with considerations of distributional effects, administrative and enforcement efficiency, and overall political feasibility;
- Communication of the results to the actors and stakeholders network, integration of broad feedback on assessment and policy alternatives into the next round of iteration.





7. NCRS, LEBANON

a. *Dissemination activities*

The Lebanese SMART case study has contributed and supported a considerable number of agencies and people supplying them with data for good use. NCRS has divided those beneficiaries into two categories: the “**Professional**” at national level, and the “**Scientific community**” at large which includes regional, national and international levels. Obviously, both categories are using the data for several and different purposes such as exploitation in their planning, or scientific research or to enhance their databases, or for scientific research and lastly to spread of knowledge. Here below is reported the Dissemination activity done by the NCRS during the project duration:

PROFESSIONAL

National level

- At national level NCRS has provided data to general scheme on land use planning, i.e. DTM, Drainage, Soil, Land use/cover, Change detection, Hazards. The planning authorities are using these data for analysis of requirements for comprehensive land use plan. Data have been given to the “Council for Development and Reconstruction” (Dr. W. Charafeddine) through contribution to the “Comprehensive Land Use Planning Project” in Lebanon, subcontracted by “Dar Al-Handasa” Consultants (Dr. S. Srour), and IAURIF (Dr. F. Awada, e-mail: iaurif.fa@dargroup.com).
- NCRS has supplied the Ministry of the Environment, especially coastal area people, with relevant data and has indicated several sectors of interests. The Ministries use the data to improve their coastal programs. (General Coordinator: M. L. Chamas, e-mail: lchamas@moe.gov.lb).

Regional Water Authority

NCRS has supplied the Regional Water Authorities with relevant data as available. The data have been useful for several purposes like administrative or water balance ones. (General Director: Dr. J. Krayim, North Lebanon Water Authority; Fax 961 6 430075).

Municipal level

At municipal level, NCRS has supplied all the maps and the attribute data. The Authorities have inserted the data in their GIS server and have used them for service or other purposes. The Geographic Information System Center – Environmental Observatory of the Union of Municipalities of the North, (Head: Mr. A. Abdulwahab; e-mail: tripoli@tripoli.gov.lb). This is an environmental data service center, supported by the Municipalities, that monitors the status of the environment and issues timely reports on several indicators thereof.

SCIENTIFIC

A Ph.D. student, Mr. Basbous (e-mail: basbous_mo@hotmail.com), who studies at “Marne la Vallée University” in France, joined the Lebanese staff. He is carrying on his research focusing on themes and approaches of the SMART project.

Moreover NCRS has supplied local researchers with required data:

- Dr. J. Halwani of the “Lebanese University”, (e-mail: jhalwani@cyberia.net.lb);
- Mr. K. Nabbout, another student attending his Ph.D. at the “Dresden University of Technology” in Germany, (e-mail: khalednabbout@hotmail.com). These students/researchers have used the data for their own researches.

The Environment Protection Committee, (President: Mr. Amer Haddad, e-mail: pipoo98@hotmail.com) is an environmental NGO working in North Lebanon that received data in order to meet its needs.

NCRS has supplied also International Organizations i.e. UNESCO, ESCWA (Economic Social Commission for Western Asia; Dr. M. Abdul Razzak, e-mail: abdulrazzam@un.org), ACSAD (Arab Center for Study of Arid and Desert lands; Dr. Abdallah Droubi and Dr. W. Erian, e-mail: droubi@scs-net.org), MAP (Mediterranean Action Plan; Dr. Marko Prem (PAP/RAC Center), e-mail: marko.prem@ppa.tel.hr), with relevant data. These International Organizations inserted the data in their databases and GIS servers as part of their regional information system.

Moreover, the NCRS has also contributed to thematic Networks of relevance such as: the Euro-Mediterranean project MEDCOASTLAND net; another similar Network called MEDWATERLAND net; and the Mediterranean Network MERSI web.

In July 2004, a public seminar with the North Municipalities and Water Authorities has been organized. The main aim of this seminar, titled “Safe Water for a Safer Community”, was to raise environmental awareness on water issues among the public in Tripoli.

NCRS has contributed to scientific workshops or conferences as they emerged (when convenient).

On 4-8 April 2004, the UN/ESA (United Nations Outer Space Office and the European Space Agency) organized in Khartoum (Sudan), the Sudan Regional Workshop on the Use of Space Technology for Natural Resource Management, Environmental Monitoring and Disaster Management. The regional workshop, entitled “Remote Sensing Tools for Studying Stress Increase of Land Use Change for Water Resource Management”, was organized to promote the use of Remote Sensing in order to assess resources and disasters.

The NCRS paper, entitled “*Environmental Water Management through Clustering to improve water availability in coastal Mediterranean areas*” focused on the increasing stress on water resources, and Tripoli was given as typical urban example.

The Scientific paper, sent to the Water Resources Management Journal for publication, is going to be presented also at the WaterMed 2 Conference that will be held in Morocco in November 2005.

b. Foreseen activities

To disseminate the results of the project, NCRS has planned several activities addressed to the general public and the scientific community. In particular, for the scientific community NCRS foresees to publish another paper and give a couple of presentations and to help more students with their degrees. For public benefit, NCRS foresees to distribute the final report copies to selected stakeholders, and to give help to another Lebanese Partner who is applying the study experience of Abou Ali watershed to another river (Litani) in Lebanon.

NCRS has planned also to expose the project results in another public Seminar scheduled between September and November 2005. The aim of this workshop is to supply information and to spread knowledge about water resources management to the community. This event will be organized in cooperation with the North Water Authorities and it will focus on the outcomes of the SMART project.

From 12 to 13 September 2005, the research paper "*Modeling Lebanese sea coast water quality using TELEMAC and GIS*", will be presented at the 6th Arab GIS Conference, in Cairo.

c. Feedback

Scientific community and Water Authorities (Municipality and Central Water of North Lebanon) are very keen to understand and make use of the deliberations, plus outcomes of the SMART project. The scientists are more interested in the analytical modeling tools, while the others, especially Municipality and NGOs, are more interested in the comparative analysis on scenarios and their future implications to the socio-economic links to water stress in the future.

8. UJFOA, JORDAN

a. Dissemination activities

The use of fresh water in Aqaba area requires good management of the resources in order to reduce losses and to protect the coastal area from pollution and from seepage of wastewater as well as return from irrigation water. Therefore, decision makers, planners and stakeholders have to be aware of the problem through dissemination activities.

The dissemination plan prepared in the second year was addressed to expose the project activities to as many audiences as possible and to involve the stakeholders of the project activities. In this regards, several presentations have been made during national and international conferences explaining the contribution of the project to the sustainable use of natural resources in Aqaba area.

Now, the involved stakeholders in Aqaba in specific, and the country in general, are aware of the problem of scarcity of water resources and of the future risk of environmental pollution. For the purpose of dissemination and exploitation, the following tasks were performed.

Representatives of different stakeholders from Aqaba Governorate attended a workshop which was held in parallel to the 3rd board meeting in Aqaba. The following agencies were represented: Aqaba Special Economic Zone Authority, Aqaba Water Authority, Jordan Environmental Society/Aqaba Branch, Friends of the Earth/Med East (NGO), and the Marine Science Station. The above mentioned workshop aimed to inform and train the decision makers from different governmental agencies and NGOs on the project activities and the expected output. The workshop was held in February 2003.

A link has been made with other related EU funded projects in the domain. Examples are WASAMED, MEDCOASTLAND, IRRIMED.

SMART results have been published through the UNESCO chair in Wadi Hydrology (Prof. Shatanawi) in their annual report, and with cross reference links of the respective web sites and the SMART project web site.

In August 2005, a one day national seminar was organized in Aqaba with the Jordanian Environmental Society (JES) inviting local representatives (local Governor, Ministry of Water (ASEZA), Ministry of Health, Department of the Environment, Civil Defence).

The project activities have been presented during the following conferences:

- “Tidal Force and Wind Effect on the Hydrodynamics of the Gulf of Aqaba Using Telemac-2D”, by M. Shatanawi, Z. Al-houri, C. Freissinet, Y. Mensencal, M. Badran and R. Manasrah. Presented at the INCO-MED Conference, held in Amman on 14 June 2004.
- “Sustainable Management of Water Resources in Coastal area” “*Gestion Durable des ressources en Eau en zone Cotier – SMART*”. Attended by C. Freissinet, Z. Al-Houri, Y. Mensencal, M. Shatanawi. Presented during the 6th Cannes Water Symposium, held in Cannes in June 2004.
- “Management of Future Water Supply and Demand for Aqaba City in Jordan”, by M. Shatanawi, G. Naber, and S. Naber. Presented at the 7th International Water Symposium in Cannes, France from 26 June to 1 July 2005.
- A Ph.D. student, Ghada Al-Naber, has completed her study on the application of WRM model to Aqaba, producing a work entitled: “Policy Guidelines for Sustainable Water Resources Management in Aqaba Governorate Catchment Areas Using Decision Support System (DSS)”.

Moreover, it is relevant to indicate a publication related to the project:

Shatanawi, M., and Naber, S.

“*Watershed Management of Zarqa River Basin in Jordan*”.

Submitted to: WATMED-2, Marrakech, Morocco, November 2005.

[on-line abstract \(MS Word\)](#)

b. Foreseen activities

To disseminate the results of the project activities, UJFOA foresees to apply the WRM model to other case studies and to use the LUC model for further studies in Aqaba. Besides, the TELEMAC model, in cooperation with SOGREAH, will be used to study the hydrodynamic of the Gulf as a

result of pumping water at a rate of about 60-80 m³/s to the Red Sea-Dead Sea Canal. This project has been approved by the World Bank and it is now under revision to establish new TR.

Moreover, a dialogue between the University of Jordan and ASEZA will be established in order to conduct studies on the use of reclaimed water for irrigation and landscaping. Result of the Socio-economic, population and water resources management model will be discussed in a national seminar.

As future activity, UJFOA foresees also to organize in Aqaba periodical one day seminars in order to disseminate the results of the project concerning the findings of TELEMAT and WRM models to different stakeholders from Aqaba. Participants will be from the following organization: ASEZA, different NGOs, the Ministry of Environment, Ministry of Planning, Ministry of Agriculture, Ministry of Water and Irrigation, Marine Science Stations and other local agencies from the city of Aqaba.

A special one day seminar will be organized by ASEZA to discuss the result of the Jordan Case Study and the findings of the Ph.D. dissertation. Participants from the following organizations will attend the seminar: ASEZA, different NGOs, Ministry of Environment, Ministry of Planning, Ministry of Agriculture, Ministry of Water and Irrigation, Marine Science Stations and from other local agencies from the city of Aqaba.

c. Feedback

The stakeholders contacted and involved throughout the duration of the project, are aware of the problem of water scarcity and of the future risk of water and environment pollution in Aqaba.

UJFOA is in continuous contact with NGOs and AZESA in order to use the results of the models in their future planning.

9. CEDARE, EGYPT

a. Dissemination activities

Throughout the project duration CEDARE has drawn on its own extensive regional networks and has established contacts with a number of ongoing related national and international activities such as PERSGA.

On February 2005, during the SEA Conference held in Cairo, a paper entitled: "Remote Sensing and GIS for Sustainable Development of the Coastal Area of Abu Qir Bay, Egypt" was submitted and presented.

The Questionnaire has been administered and carried out through a cooperation with a NGO. The following stakeholders were included: decision makers, fishermen, factory workers, farmers, investors, and more than 100 personal contacts carried out in the field.

An abstract of a paper, entitled "Sustainable Development of the Coastal Area of Abu Qir Bay, Egypt", has been submitted to the "International Conference on Environmental Change in Lakes,

Lagoons and Wetlands of the Southern Mediterranean Region". The International Conference will be held from 4 to 7 January 2006.

Lectures have been delivered by the Team leader at several National meetings such as:

1. National Authority of Remote Sensing and Space Sciences (NARSS), Egypt;
2. Institute of Graduate Studies and Research, University of Alexandria;
3. Training course for Iraqi stakeholders on Mesopotamian restoration.

b. Foreseen activities

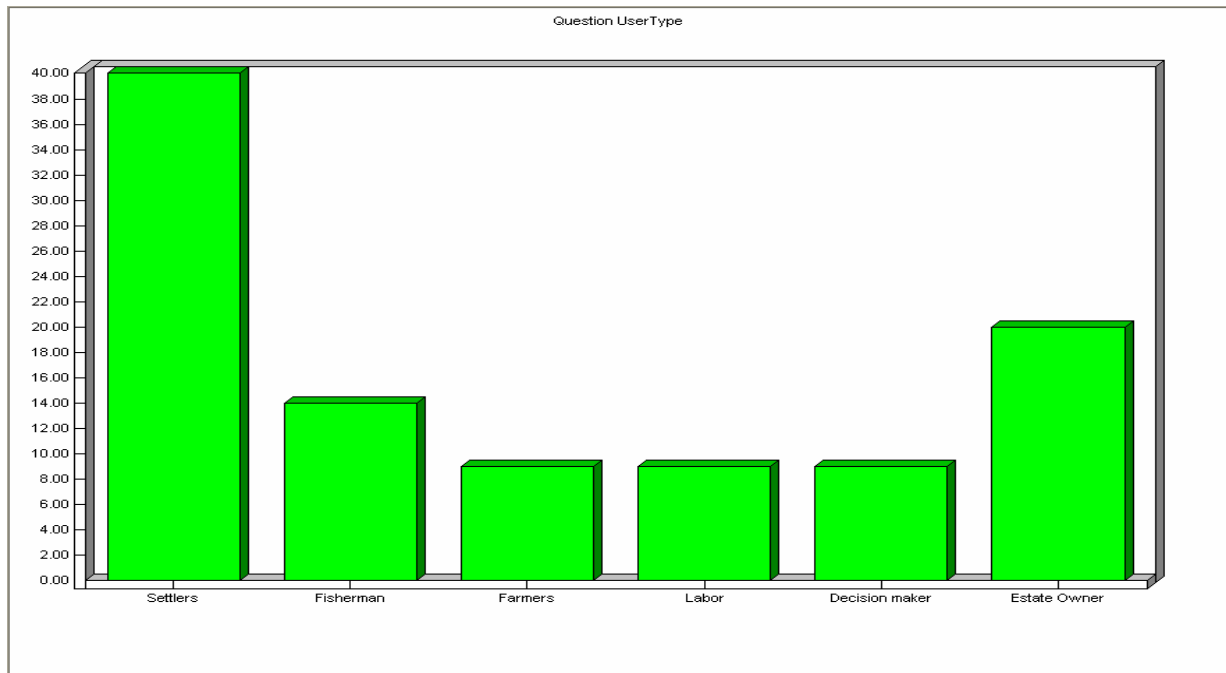
In addition to the Dissemination Report, as foreseen activities, the following points are considered worthy for the utilization and exploitation of the project results:

1. Copies of the final Report with Arabic recommendations will be submitted to the Governorates of Alexandria and Behaira.
2. An Arabic summary will also be submitted through CEDARE to the following organizations:
 - a. Ministry of Environment
 - b. Ministry of Water Resources
 - c. Ministry of Planning
 - d. Ministry of Tourism

c. Feedback

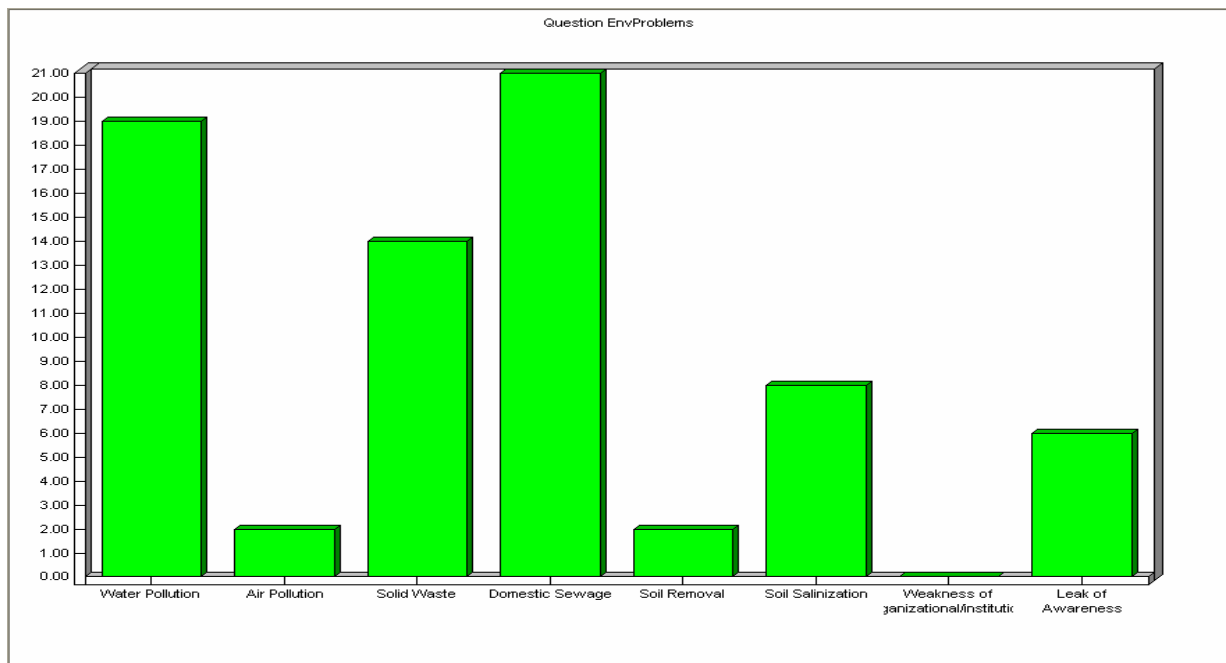
A survey of stakeholders has been carried out based on person to person interviews in coordination with a non-governmental organization and the participation of SMART team members. Data have been recorded and analyzed statistically so as to get insight.

Generally, all the stakeholders have been cooperative and interested to continue the cooperation and to see the implementation of the suggested development programs. The types and numbers of surveyed stakeholders are presented below:

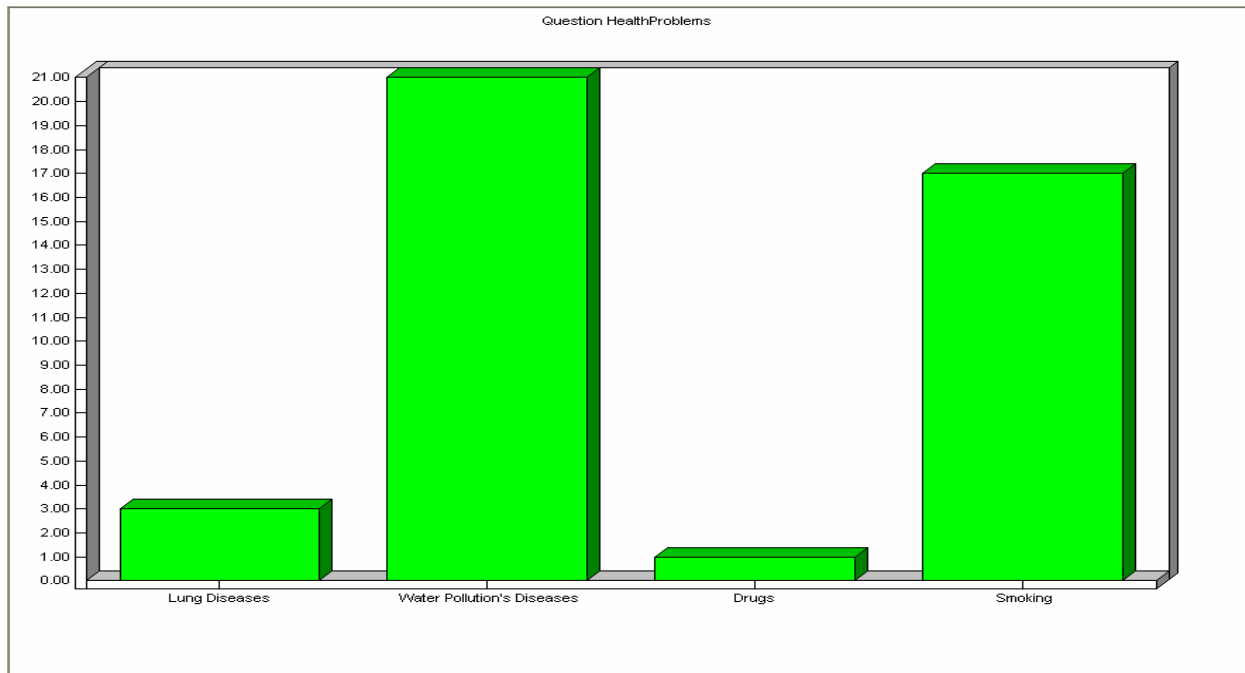


The results of the survey indicate that:

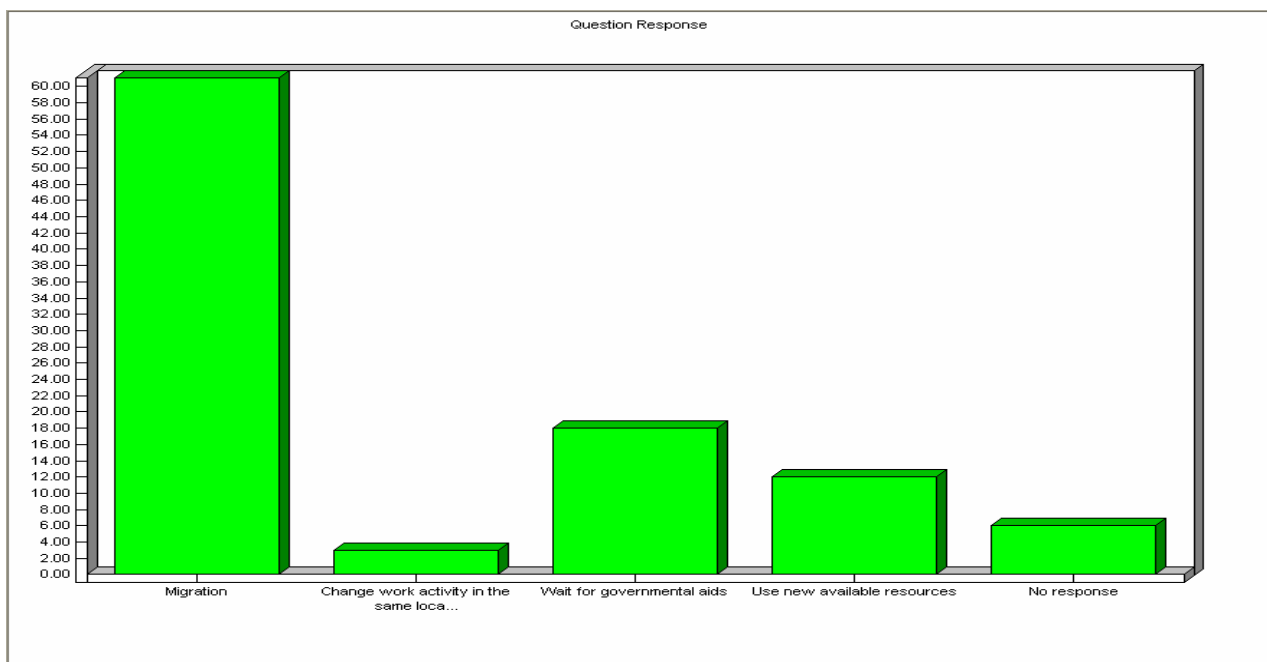
1. The stakeholders have identified the first major problems of the Region as water pollution and wastewater. Solid waste comes second. The next diagram shows the identification of stakeholders to regional problems.



2. Waterborne diseases have been identified as the major problem (of course this requires actual scientific investigation based on statistical data).



3. The response in case of sea level rise (water logging and excessive soil salinization) shows that most of the population will migrate and/or wait for helps by the government. This is shown in the next figure.



4. Decision makers have blamed the weak enforcement of environmental laws and regulations and severe shortage of funds.
5. Farmers and investors require governmental support for pollution control and less administrative regulations and better transportation routes for marketing their products.

10. CNT, TUNISIA

a. *Dissemination activities*

Throughout the duration of the project, CNT has disseminated the project results by means of the UNESCO web site “L’ Observatoire du Sahara et du Sahel (OSS)” (<http://www.unesco.org/oss/>)

CNT also published the results as an integrated part of the annual National Environmental Report, edited and published by “L’Observatoire Tunisien de l’Environnement et du development”.

The dissemination was done by providing the appropriate links from the CNT web site. Selected contents were also translated in French to reach the audience of the francophone countries in the region.

In October 2004, in occasion of the “SMART Management Board Meeting” held in Tunis, a special National Meeting on “Water Resources Planning and Management” was organised, featuring the SMART project and the project results of regional interest.

On December 18, 2002, a one day information seminar was organized at national level for the starting of the project. Several scientists and Ministries representatives were invited in order to inform them about the project peculiarities, objectives and future results.

In May 2004 the SMART project was also presented during the National Scientific Committee which involved governmental representatives at national level.

b. *Foreseen activities*

As foreseen activity a final one-day information seminar will be organized by the end of this year (2005) to expose the final results of the SMART project and particularly to present the final Tunisian case study to a wider audience formed by scientists, professors, government representatives and local stakeholders.

The next 14 - 17 November 2005, during the “WATMED 2 Conference” that will be held in Morocco, the work “*Gestion de l'eau dans la zone côtière : Méthodologie et outils*” will be presented by Amri Mohamed Ali and Kochlef Monia.

Besides, another presentation entitled: “*Atelier de modélisation des écosystèmes marins*”, by Chouaya Ali, is foreseen in Tunis in September 2005.

c. *Feedback*

No feedback have been received so far by the stakeholders at local, regional or national level.