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I. INTRODUCTION

Water management requires the best possible knowledge of existing actors, programmes, techniques and methods used, available tools and documentation, results of research, training opportunities, etc ...

The information available on the above only exists, at either international or national level, in a fragmented, dispersed and heterogeneous way.

Therefore it is necessary to make an effort to rationalize and make this information readable, easily accessible and available.

This is the reason why, during the Marseilles Euro-Mediterranean Conference on Water Management (November 1996), the representatives of the 27 countries, signatories of the Barcelona Convention (November 1995) and the European Union and Commission decided to study the setting up of an information system that would facilitate access to information by using modern communication means and networking already existing systems.

"Documentation", "Training", "Research-Development", "Institutions" and "Data management (tools and methods)" were chosen as priority topics of exchange that could strengthen a Euro-Mediterranean dialogue, with other topics that should be later integrated into such a system.

During the Marseilles conference (November 1996), a **working group of 10 countries** (Algeria, Cyprus, Spain, France, Italy, Jordan, Malta, Morocco, United Kingdom, the Palestinian Authority), **coordinated by France**, proposed to carry out a preliminary study that mainly aimed at studying the conditions for the setting up of this system, called **"EMWIS: Euro-Mediterranean Information System on the Know-how in the Water sector".**

This working group carried out its work from January 1997 to November 1997. It met in **Amman** (Jordan) in April 1997 and in **Valencia** (Spain), on October 1, 1997 and will present its conclusions in **Naples** (Italy) in December 1997 during a conference that will regroup the water managers and other main operators of the 27 countries that could be involved in the project.

This document presents the conclusions of the preliminary study. It includes:

- ◆ A presentation of EMWIS
- An analysis of the present situation;
- Proposal for the structure and development of EMWIS;
- Cost estimate for the implementation and financing during the first 3 years.



II. PRESENTATION OF EMWIS

A. EMWIS Objectives

EMWIS is a tool for cooperation between Euro-Mediterranean countries, that aims to:

- Facilitate access to existing information on know-how in the water sector;
- ◆ **Develop the sharing of information** while permitting everyone to make known its responsibilities, activities, concerns and topics of interest ...;
- ♦ Elaborate common outputs and cooperation programs to develop available information and promote the collection of missing information.

Its setting up implies an active participation and the sharing of information and experiences of the partner countries involved in the system.

B. EMWIS Description

From a technical point of view, the definition that may be chosen is as follows:

EMWIS is a Euro-Mediterranean system of shared and approved information on know-how in the water sector.

This definition comprises 4 significant concepts:

1. A Euro-Mediterranean information system:

Above all, EMWIS is concerned with the information available in the 27 countries, signatories of the Barcelona Convention: the 15 countries of the European Union and the 12 countries of the Mediterranean.

2. Information is shared:

The word "shared" means that:

- ⇒ information is provided by the various countries or by international information sources that participate in the system;
- ⇒ information remains at the level of the providers and is not centralized in a central data base.

1. Information is approved:

Only the information sources having been granted a "quality stamp" by EMWIS managers, will be accessible through this system. The information quality, updating and reliability will be guaranteed by each information source.



2. Information relative to "know-how in the water sector" :

The term **"know-how in the water sector" is the main characteristic of EMWIS.** It means that:

- ⇒ EMWIS is only giving access to information on "know-how", for instance:
- Institutions and experts that intervene in the water sector;
- **Documentation** in the water sector;
- Research and development programs;
- **Training** opportunities:
- Methods and techniques used for water resources management;

-

- ⇒ EMWIS <u>does not manage data on water resources</u> or on uses. It is not planned that EMWIS could contain data on:
- surface water quality (for instance: pH, conductivity, dissolved oxygen...);
- quantitative aspects (examples: river flow rates, aquifer piezometry...);
- withdrawals and uses (examples: list of water intake points, irrigated areas ...);
- discharges (discharge locations, quality of discharged water ...);

-

Therefore EMWIS is neither a data base on water resources nor a tool for water resources management.

⇒ Generally speaking, **EMWIS manages information** and not data.

C. EMWIS status as regards the main international information programs related to water in Europe and the Mediterranean

EMWIS, owing to its original approach towards "know-how" in the water sector, is complementary to many international actions that are carried out in the Euro-Mediterranean countries and that usually deal:

- ⇒ either with the management of data on water resources in particular (European Environmental Agency, MED-HYCOS ...);
- ⇒ or with a particular aspect of "know-how" (training, directories of local experts, ...).

In order to develop a potential synergy, a close collaboration with these international programmes is to be planned.

D. Beneficiaries

EMWIS mainly addresses public and private operators of the Water sector: decision-makers and professionals (technicians, consulting firms, training centers, document draftsmen...).

However, as agreed at the Marseilles meeting "access to information made available through the system will be open to anyone who is interested in water management issues".



III. ANALYSIS OF THE PRESENT SITUATION

A. Assessment of the situation of information search on Internet

Generally speaking, access to information servers on Internet is nowadays the most used means for the search of information. Navigating on the sites concerned with a given sector is a good work basis. The hypertext links often enable to discover other sites in the same sector of activity.

Discussion forums (News server via NNTP protocol) offer an interactivity and a variety of subjects per topic: the forum is one of the keys for accessing to hidden information. Thus, navigating with the help of search engines is useful. Discussion forums are often access free.

The use of a Web navigator that integrates a client of electronic mail and forum management provides access to a considerable volume of information.

However, the use of the above-mentioned services causes quick disappointment, as:

⇒ SOME SECTORS ARE STILL WEAKLY COVERED

While computer science or finance are omnipresent on Internet, the number of WEB servers is much more limited on other topics, water in particular.

\Rightarrow ACCESS TO <u>USEFUL INFORMATION</u> REMAINS DIFFICULT

The indexing made by standard search engines is not sufficiently intelligent and detailed for an in-depth search. The results thus obtained are often disappointing, either due to the volume of poor information, or due to the lack of relevant sites. The volume of poor information is such that it is usually necessary to resort to qualified staff to extract the really useful information.

⇒ THERE IS NO QUALITY GUARANTEE ON THE INFORMATION THUS OBTAINED

As Internet success is linked, for a large part, to its free access, either for consulting or dissemination, it is often difficult to assess information relevancy. In addition to the deliberate disinformation that is used in some sites as regards rival technologies, it is frequent to find Web sites whose information is not up-dated, or whose hypertext links lead to nothing (the link is not operational, the referenced page has disappeared...).

This is the reason why many, more or less, specialized services (financial and technical data, general news ...) are, from now on, available on Internet, and, for a fee, offer better targeted contents than the public sites.

Having complete and good quality information available for the officers in charge of water policy and various operators, requires the use of a homogeneous and efficient institutional system: EMWIS.



B. Analysis of expectations and available information per topic

During the Amman meeting (April 1997), the working group of the 10 countries decided to define EMWIS specifications, using thematic reflections in four fields which will be led by groups of partner countries that proposed themselves to do so.

4 thematic groups have thus been created:

TOPICS	Partners in thematic groups
1- Documentation	France*, Jordan, Morocco Palestinian Authority
2- Training / research and development	Cyprus, <u>Italy</u> *, Malta
3- Institutions	Algeria, Cyprus, Spain*, Morocco
4- Data Management	Malta, United Kingdom*, Palestinian Authority

In liaison with **the International Office for Water**, each thematic group prepared questionnaires in order to mainly evaluate the expected information and the range of available information on each topic.

These questionnaires were sent to the other countries of the working group and to various specialized organizations. The replies obtained were summarized in reports presented in the appendices.

This chapter summarizes the orientations given by each group.

1. The "documentation" group:

The replies sent by the 10 countries of the working group emphasize the following:

- 1. There is a strong interest for access to documentation on water in three main forms: global or aggregated information, precise and detailed information, synthesis of the art;
- 2. The potential users wish to have user-friendly and guick search tools with relevant replies;
- 3. The possibility of accessing basic documents is also requested;
- 4. The available information must be validated and updated by the concerned organizations.

2. The "training, research and development" group:

The questionnaire of this group focused on the three following fields: potable water, irrigation and resources management. The analysis of the replies sent by 8 countries (out of 10) emphasizes the following:

- 1. EMWIS will be intended for, at least at the beginning, governmental institutions, research and training centers and universities in particular. The interest of the private companies and local water management organizations for EMWIS has not been thoroughly studied.
- 2. The future users of EMWIS expect, as regards system operation: the use of key-works and hypertext, the telematic transfer of data and documents and the automatic dissemination of information up-dates;



Leader of the thematic group

- 3. The most interesting sectors on which a lot of information is available are:
 - ⇒ aspects related to water demand management (prevention and reduction of water losses, development of low water consumption irrigation techniques, wastewater reuse for irrigation and non-potable uses, ...);
 - ⇒ sustainable management of water environment (control of water quality, use of information systems for water resources management, environmental impact of water projects, ...).
- 1. The exchange of information will favor not only the transfer of research results, knowledge of interesting events such as: congresses, seminars and training courses, but will also be a tool for the setting up of research networks and joint training programmes. The result, the most expected by EMWIS users, is, in fact, to get acquainted with the research and training activities that are jointly carried out by several countries or international networks. Therefore, it is expected that EMWIS will favour the participation in joint activities of organizations of several countries and in cooperation programmes at governmental level on research and training topics. Very efficient actions will be undertaken for the transfer of knowledge.

To summarize, the study emphasized that EMWIS will be a very important communication tool for a Euro-Mediterranean dialogue by way of topics on Research and Development and Training in the water sector.

3. The "institutions" group:

The replies, sent by 7 countries to the questionnaire of the "institutions" working group, emphasize the following :

- 1. The expectations as regards EMWIS mainly come from public institutions, research and training centers that wish to get access to information on equivalent administrations in the other countries:
- 2. The potential users of information on legislation are, above all, central, regional and local administrations.

4. The "data management" group:

The questionnaire of the "data management" thematic group focused on the following fields: potable, industrial and irrigation water. The 10 countries of the group replied to the questionnaire. The replies obtained emphasize the following:

- 1. Most of the countries of the working group have detailed information on the management of data on potable water;
- 2. Information relative to the management of data on industrial water and irrigation water is less detailed, but will nevertheless be very useful for the potential users of EMWIS information system.



C. Synthesis of the study on communication networks

Following a series of visits in France, Morocco, Spain, Italy, Jordan, Cyprus, Malta, the United Kingdom and the Palestinian Authority and a meeting with representatives of DGXIII, the conclusions of the expert in charge of the study can be summarized as follows:

- 1. The 27 countries are already connected to Internet and the computer equipment used in the countries is relatively homogeneous (PCs under Windows with Office, Access, Oracle, Arc info software are most often used);
- 2. The phenomenon of fast expansion which is at present the characteristics of Internet is originating many dysfunctionings: for instance, it has been noted that the networks are often overloaded and this implies very long response times;
- 3. The improvement of the communication efficiency can be envisaged in three ways:
- the use of commercial Internet networks with a service guarantee (Concert, Global One, World Partners) with line rental;
- the resort to research networks: Ten34 (funded by EU at 40%) and Raitnet (UNESCO);
- the use of environmental networks (EIONET, MED HYCOS);

4. The yearly costs for connection to a WEB server are estimated as follows:

TYPE OF CONNECTION	Estimated cost/year/site
- Connection with 64 kb/s	12,000 à 17,000 ECU/year/site
- Connection with 128 kb/s	30,000 ECU / year /site
- Connection to a commercial service	to 120,000 ECU/ year / site
provider with guarantee	
- Connection to TEN-34	About 50,000 ECU/year/site (1st estimate)

Conclusions

The use of research networks such as TEN-34 and RAITNET is recommended to improve communication between the partners of EMWIS network. **TEN-34** is the trans-European network with 34 Mb/s. It is partly financed by the European Union to provide research and higher education centers with an effective network, while opening it to institutional and industrial partners.

Solutions for the connection of some countries (Cyprus, Israel, Malta, Turkey) that are not served by these networks will have to be studied on a case by case basis. Malta and Cyprus, owing to their geographical situation and their technological advance, could play an important role of relay between both shores of the Mediterranean by realizing high speed liaisons between TEN-34 and RAITNET.

It is recommended to the National Focal Points (a concept defined in Chapter IV) to request a connection to one of these two networks.

RAITNET Network (Regional Arab Information Technology Network) was created by CERIST (Center for Research on Scientific and Technical Information) in Algeria, IRSIT (Regional Institute for Computer Sciences and Telecommunications) in Tunisia, RITSEC Information Technology (Regional Software Engineering Center) in Egypt, NIC (National Information Center) in Jordan, and the Kuwaiti Ministry of Communications, with the support of UNESCO and the International Telecommunication Union. This network is open to all the main actors involved in the development of information communication systems in the Arab World.



IV. PROPOSALS FOR THE SETTING UP OF EMWIS

A. Programme for the setting up and activities of EMWIS

The setting up of EMWIS can only be achieved by way of a simple, pragmatic, progressive and feasible strengthening program.

This program must emphasize from the start the advantage of the system and allow for a progressive integration of the partners. It could be broken down as follows:

1. In the short term (1998 - 2000)

- Organization of EMWIS's management structures.
- Development of access to information on **priority topics**:
 - Organization of the communication network;
 - Preparation of and access to directories (institutions, operators, people, ...) and catalogues of information sources in the 27 countries;
 - Development of common accesses to existing information systems;
 - Development of access to information which is not yet digitized (paper files, microfiches ...);
 - Extension of access processes to additional languages (other than French and English);
 - Elaboration of common programs and outputs to develop available information;

<u>Remark</u>: the improvement of access to available information may, in some cases, be achieved by developing specialized tools for access, retrieval and dissemination of information.

2. In the medium term (3 to 5 years)

- Extension to **additional** and new **topics**;
- Creation of information systems on non-covered sectors with the organization of common work programs (information collection, validation and dissemination) and the elaboration of common outputs to develop available information.

B. EMWIS Organization

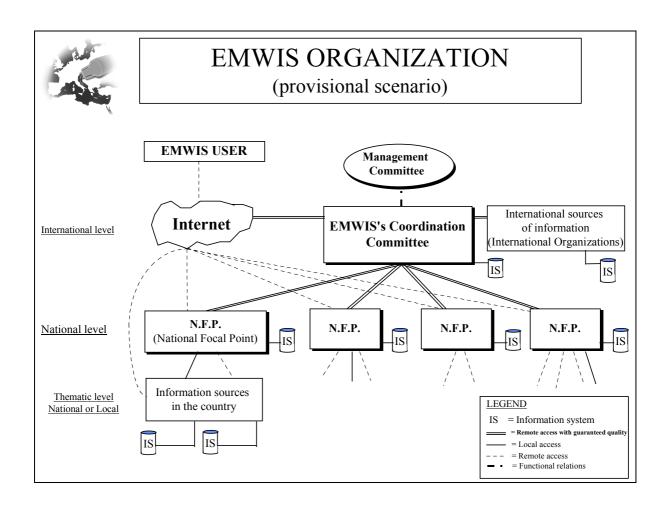
1. Overall structure

An overall structure was agreed to during the Amman meeting (April 1997) that relies on National Focal Points and on an International Coordination Unit.

During the Valencia meeting (October 1997), the management structure at international level was defined with the establishment of a **Management Committee** and a **Coordination Committee**.

The following diagram presents a draft structure for the organization of EMWIS which was agreed to in Valencia:





2. Proposed organization of the management structures at international level

a) The Management Committee

The **Management Committee** is composed of :

- ◆ The representatives of 10 countries (1 representative per country with the possibility of alternating countries from one year to another with the exception of the countries which are members of the Technical Unit (see below) and which constitute the core of the Management Committee);
- ◆ A representative of the European Commission

It is responsible for:

- Defining the main strategic orientations:
- ⇒ Legal aspects and the international status of EMWIS:
- ⇒ General economy of EMWIS in order to ensure its sustainable operation;
- Validating the results obtained in each phase;
- ◆ Validating EMWIS annual action plan and budget proposed by the Coordination Committee.

The Committee meets once a year with alternate organization of the meetings.



b) The Coordination Committee

The **Coordination Committee** comprises a <u>Technical Unit</u> and <u>the representatives of the National Focal Points</u> involved in the project.

The **Technical Unit** is composed of a consortium of operators of several countries. The provisional list of these operators is as follows: IOW (France), CEDEX (Spain), Hydrocontrol (Italy), WRc (United Kingdom). These operators constitute a permanent structure which is responsible for carrying out the actions defined with the National Focal Points while respecting the general orientations defined by the Management Committee.

This Technical Unit is responsible for:

- ◆ Proposing to the Management Committee the main strategic orientations, annual action plans and budgets, defined with the National Focal Points;
- ♦ Coordinating, driving, and should the case arise, providing a technical support to the activities of the National Focal Points:
- ⇒ Possible assistance for the detailed identification of human and equipment needs;
- ⇒ Organization of the necessary training programmes:
- ⇒ Assistance to the elaboration of the directories and references:
- ⇒ Organization of the information collection supervised by the National Focal Points;
- ⇒ Organization of the approval procedures of the national information sources;
- ⇒ Support to the organization of access to information on National Focal Points' servers
- ⇒ Assistance to the elaboration of common outputs;
- Carrying out the tasks of the "Focal Point of International Organizations" :
- ⇒ Inventory and agreement of international data sources;
- ⇒ Translation of protocols of information access into the official languages of EMWIS;
- ⇒ Development of access to international information sources;
- Developing and managing the information server of the Coordination Committee :
- ⇒ Development of access applications and procedures;
- ⇒ Entry and integration of the information foreseen at this stage;
- ⇒ Management of communications with the users and NFPs;
- ⇒ Development of specialized tools for research, access and dissemination.

Organization of the Technical Unit:

The Technical Unit should have a legal status allowing it to combine the competences of several organizations and to mobilize the funds necessary for its activities (see the list of tasks to be carried out in the preceding chapter).

Besides, it will have premises and necessary equipment means at its disposal for organizing meetings and developing the information system at international level.

The coordination with National Focal Points will be implemented by way of regular meetings and by intensive use of video-conferencing.

- ♦ Corresponding minimum human resources:
 - ⇒ 1 full-time coordinator
 - ⇒ 1 computer expert (engineer)
 - \Rightarrow 1 multilingual assistant



- ⇒ Several information managers who can be residents of various countries.
- Required equipment :
 - ⇒ Adequate premises with a conference room;
- ⇒ Computer material (equipment of the permanent staff and Internet server);
- ⇒ Advanced communication means (<u>high-flux Internet access</u>, video-conferencing equipment...)

Remark:

The option aiming at providing the Technical Unit with sufficient premises for receiving full-time information managers from several countries, appeared to be too « heavy » for being chosen at this stage.

3. Organization of focal points

Each country controls the organization of its National Focal Point.

Generally speaking, the National Focal Points will be mainly responsible for :

- Participating in coordination and information meetings organized by the Coordination Committee (physical participation or by video-conferencing, depending on the case);
- ◆ Making an inventory and approving, according to the orientations defined by the Coordination Committee, the sources of available information in the country, that can be accessed through EMWIS;
- Organizing the procedures of communication and access to approved information in the country;
- Ensuring that the protocols of access to information are translated and available in the official EMWIS languages
- ◆ Developing, whenever necessary and according to the standards defined by the Coordination Committee, the tools and interface software which will facilitate access to homogeneous information in the country;
- ◆ Ensuring relations with the country's users (analyses of the users' satisfaction, identification of new requirements ...);
- ◆ Contributing to the elaboration of the annual action programme of the Coordination Committee's Technical Unit .
- # Organization recommended for an optimum operation of the National Focal Points:

Remark: as the organization of the National Focal Points is the responsibility of the countries, this chapter only intends to provide some indications on the organization that would seem a-priori advisable for an optimum operation of the National Focal Point.

A small team (3 persons) assigned by the relevant authorities to the EMWIS project, within a public or parapublic organization in charge of gathering and disseminating documentation and information relating to the water sector in each country.



This team would have the means necessary for coordinating the tasks (premises, telecommunication, video-conferencing...) and for developing the information system used at national level.

- ♦ Corresponding human resources :
 - \Rightarrow 1 full-time coordinator;
- ⇒ 1 computer expert (network-specialized engineer and webmaster);
- \Rightarrow 1 multilingual assistant.
- Required equipment :
 - ⇒ Adequate premises with a conference room and office space for receiving the partners;
 - ⇒ Computer material (equipment for the permanent staff and specific Internet server);
 - \Rightarrow Advanced communication means (access to Internet through specialized connections, video-conferencing equipment....).



V. IMPLEMENTATION COST AND FUNDING

The table hereafter shows a first estimate of the necessary budgets to implement EMWIS project during the development period (1998-2000) and presents a cost distribution over three years.

This budget proposal includes 3 main components:

- 1. **The "International Level " component** covers the setting up and operating costs of the coordination structures at international level as well as the reinforcement of international communication links to enable exchanges on Internet with guaranteed quality;
- 2. **The "National Focal Points" component** covers the NFPs' investment and operating costs (estimated average value) that are directly incurred by the setting up of EMWIS (excluding premises and wages);
- 3. The "Technical Assistance/Training/Evaluation" component covers general expenses regarding the international level as well as NFPs: technical assistance, training, promotion of EMWIS in the countries.

The costs used to draw up this table are detailed in annex 10.

As regards the "International Level":

- ◆ The budget of the "Management Committee Meetings" should allow for the organization of annual meetings of the Management Committee;
- ◆ The "Investment cost for the Technical Unit" includes the hardware, software and office equipment necessary for its operation;
- ◆ The " Operating costs of the Technical Unit" cover:
 - ⇒ Premises rental costs, communication costs (connection, subscription to Internet, telephone and fax), hardware and software maintenance, translation, organization of coordination meetings, travel expenses;
 - \Rightarrow Salaries of the full time project manager, computer expert and assistant.
- ◆ The budget of the "International Communication Network with guaranteed quality" is meant to facilitate, on one hand, the development of Internet links between TEN34 and RAITNET networks and, on the other hand, to connect some countries to one of these two networks;

Regarding the "National Focal Points", the total amount has been calculated while taking for granted that ten countries will join EMWIS within the first year and ten other countries within the second year (meaning a total of twenty countries). The indicated mean unit costs will have to be revised for each country on a case by case basis. They include:

- ◆ Investment costs which correspond to the hardware and software equipment considered as necessary for the good running of NFPs;
- ◆ Operating costs which cover communication expenses (connection costs, subscription to Internet, telephone and fax), hardware and software maintenance, translation,



organization of coordination meetings, travel expenses, specifically to participate in training courses and coordination meetings.

Regarding the item "Technical Assistance/Training/Evaluation":

- ◆ The Technical Assistance budget has been planned to finance the intervention of experts to give technical assistance for the following in particular:
 - ⇒ Organization and setting up of the international communication network;
 - ⇒ Organization of directories and catalogues (directory structure, definition of references, references used, organization of data collection, defining quality references, defining validation procedures);
 - ⇒ Back-up for developing access to available information (thesaurus organization, dictionaries harmonization and standardization, defining exchange formats, developing exchange interfaces...)
 - ⇒ Back -up for organizing access to information not yet digitized;
 - ⇒ Back-up for developing research tools;
 - ⇒ Back-up for preparing common products for information development;
 - ⇒ ...
- Regarding the "Training" budget, the following organization has been planned:
 - ⇒ A one-week training course per year for the computer scientists working in National Focal Points and in the Technical Unit;
 - ⇒ A training course about quality concepts (one week) for the National Focal Points Managers;
 - ⇒ A One-year training programme for the coordination of Focal Points Managers regarding information collection, management and discussions.
- ◆ The budget for an "Information Seminar in the Countries" should cover the organization of an awareness raising meeting for national operators in each country; at least two representatives of the Coordination Committee should participate in this meeting in order to inform about and analyze the expectations towards EMWIS.
- ◆ The budget for a "final evaluation of the 3-year program" will cover a technical and financial assessment of the operations carried out during the development period and the identification of a series of proposals to continue EMWIS activities. This assessment will be undertaken by an operator who is outside the system.

The conditions for funding this program will be defined later on.

The following principles could then be taken into consideration:

- 1. Each country takes charge of the funding of its national focal point;
- 2. International expenses will be taken care of by sharing the cost between the countries of the European Union involved in EMWIS's Technical Unit and the European Commission.

